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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., January 6th, 1921. No. I

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

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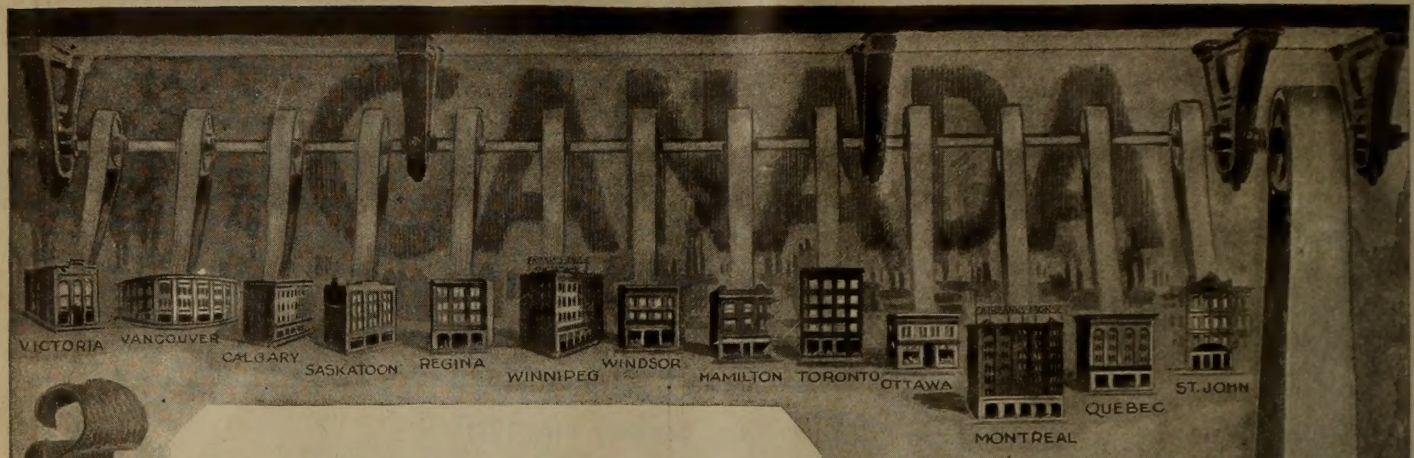
Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

Subscription to any address in Canada, United States and British Empire, $5.00 yearly. Other Countries Postage Extra. Single copies, 15 cents.

Changes of advertisements should be in the Publishers' hands ten days before the date of issue.



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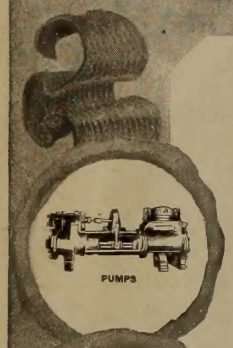
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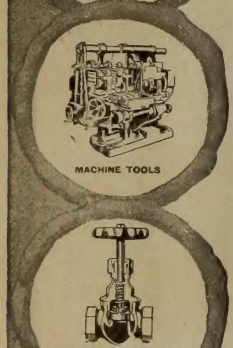
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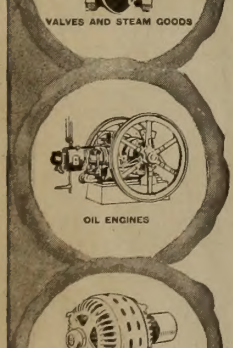
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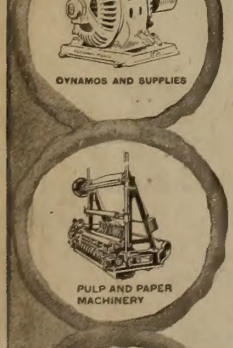
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-:- EDITORIAL -:-

A NEW START.

1921 has begun. 1920 is a memory; perhaps of achievement, perhaps of disappointment. In either case, 1920 has gone, but what we are today is largely the result of what we thought and did then. Did we think of the other fellow, were we careful, did we do our best each day honestly and cheerfully? Then 1921 will surely be a happy new year. If we were careless, thoughtless, negligent or grouchy, let us solemnly resolve to make a cleaner record in 1921.

WHILE CHILDREN STARVE.

While millions of children are actually starving in Europe and China, the pulp and paper makers will partake of their annual bountiful banquet in Montreal on the evening of the 20th January. Nobody will begrudge these more or less prosperous people the opportunity of gathering in good fellowship about a well laden board. It is the happiest occasion of the year and there is certainly no shortage of food in Canada to be considered. The unfortunate features of our prosperous condition is that we cannot readily share our material welfare with those who are actually in serious want. But though we cannot extend our hand in person to help and cheer, we can do it effectively by proxy through the Canadian Red Cross.

One of the most enjoyable and satisfying features of recent banquets has been the collection for some good cause. For several years the contribution went to the Tobacco Fund for the boys at the front; after that it went to work of the Khaki League at home. Will there be a collection this year, and where will it go? The most crying need (literally) is to feed the millions of children who are starving for want of food and freezing for lack of clothing so as to save as many as can be reached before they die. Perhaps the Canadian Pulp and Paper Association has already planned the complete program for the banquet. We hope there is time to provide an opportunity to give as well as to get. In past years, thousands of dollars were gladly given to provide smokes for the soldiers in a war which has left millions of irresponsible children **absolutely** without food, except as it is provided by the great relief organization left over from war time. The fact that Germany was responsible for the war does not relieve us from responsibility for the lives of innocent children threatened as the result thereof, insofar as we are able to help. Ten dollars will feed a child till the new harvest, assuming the people have strength enough to plant a crop. The British Empire War Relief will use our contribution, sent through the Canadian Red Cross, where it will do the most good.

The paper mills and individuals in the industry gave thousands of dollars to campaign for McGill University. Let them respond as generously to this greater call when Pipe-Major Gray and his Highlanders come round again. We have not described the heart-breaking scenes and conditions witnessed daily on the other side. It should be enough to say that children are hungry.

Come to the banquet with a big roll or a fat check and if you cannot be on hand to put your contribution in Friend Bothwell's hat, send your check to the Pulp and Paper Magazine — made out to "British Empire War Relief", and it will speedily be on its mission of mercy. Be a real Christian and "come across."

MILL MEN APPRECIATE TECHNICAL CONTROL.

One of the happiest results of the work of members of the Technical Section, illustrating at the same time the underlying purpose of the Section and its appreciation by the mills is the vote recently taken at Iroquois Falls, Ont., by the skilled employees of the Abitibi Power and Paper Company. Other companies are working along similar lines, but we know of no instance where the practical men, the operators, have expressed themselves so distinctly in favor of the scientific control of mill work.

For several years the company employed chemists and engineers who have been quietly making tests, observations and deductions. Mill men, for a time, rather ridiculed the idea of measuring the quantity of white water and determining the amount of fibre in it, or keeping close records of grinder speeds, pressures and temperature: "sewer rats," they called the little crew that tried to find out the truth as to causes and quantities of lost fibre, the reasons for breaks on the machine, defective paper, etc. The practical man did not understand and so failed to appreciate the connection between a defective grinder stone, a batch of weak liquor or a hole in a wet machine wire and the company's payroll. Lack of understanding induces prejudice, but paper makers are usually thoughtful chaps and they finally saw that better and more uniform grinding and cooking meant better running on the machine, fewer breaks with less work and less broke with fewer complaints. They saw that knowledge, in-

telligence and research, applied in the form of scientific control, meant smoother and more efficient operation of the mill. It means that by doing his work **right** a man did his work **better** and **more easily**—and he could be proud of the result. No wonder, then, that when a vote was taken to ascertain the attitude of the men of Abitibi toward scientific control that their approval was unanimous.

But the men in the mill are not content with letting the men from the laboratory have a corner on the knowledge that makes scientific control possible and most effective. They appreciate that the opportunity and willingness to study is really the foundation of success. Successful men study; successful processes are the result of study. When the men of Abitibi were asked if they wanted classes in pulp and paper making the vote was unanimously in favor and fifty out of sixty-eight wanted to take a full course, desiring especially to understand what goes on in other departments. There is no independent department in a paper mill; one cannot operate without the other.

The efficient operation of modern machinery requires workmen of intelligence and some education along vocational lines based on the fundamentals of mathematics and elementary science. Whether the workmen in our industry qualify is in their own hands. The opportunity is being prepared and in some cases, as at Iroquois Falls, has been offered. Manager McInnis was right in saying that: "The future of this industry, is fewer men and better men, the men will have to be more skilled and the unskilled man will become of less and less importance."

This simply means that the practical man and the technical man must get together and keep the ball a-rolling. The appreciation of the need for co-operation between the mill and laboratory is a natural development and a full justification of the existence of the Technical Section. Realization of the fact that they can and should co-operate with and assist the technical man (who has long realized his need of the practical man) will gradually increase the attendance of mill men at the meetings. They will become associate members and the usefulness of the Technical Section will be greatly extended. The time to begin is January 19th and 20th, at the Ritz Carleton Hotel, in Montreal.

On another page is a short paragraph that tells a long story. Howard Smith Paper Mills, Ltd. has consistently been working to develop a real community spirit in the town of Crabtree Mills. The cordial co-operation of the employees, the town's people, and their spiritual advisers, has made possible the happy climax to the year's work in the Community Christmas Tree. Other paper makers are doing similar work, which shows what a force for good this industry is in Canada.

COBWEBS.

The course of new pulp mills ne'er runs smooth. Here is the Great Lakes Pulp & Paper Co. still worrying about a source of power.

Crabtree Mills is not the only pebble on the beach. The children of Iroquois Falls also had a Christmas play.

Too bad the Ottawa River can't co-operate better with the pulp and paper mills and give the power they need to operate at capacity.

Scientists have found that carbon dioxide, let loose among growing vegetables, greatly increases the yield; the increase in the case of potatoes was 180 per cent. Here is a chance for steam power plants to raise vegetables.

It is reported that New York printers are to get another increase in wages amounting to $5 a week. It looks as if employers in the printing trade might not be able, at that rate to buy paper to keep their printers at work.

The Great Southern Lumber Co. has kindly sent a photograph showing broadcast seeding of forest trees in Louisiana. Twelve men are seen, marching in extended order. We are glad to note this evidence of real forestery work in the South.

Edward Beck, who is in charge of the publicity work of the Canadian Pulp and Paper Association, has prepared a review of conditions and probabilities for increased production in the Canadian Industry which will be published in the next issue of the Pulp and Paper Magazine.

The taxes are coming; they are, they are. The Royal Trust Company of Montreal evidently saw the shadow that portends the advent and has prepared for distribution a booklet entitled "The Income Tax and the Individual". It is designed to help the individual avoid the heavy penalties automatically imposed by the law for inaccuracy or delay. The taxpayer must get his own forms and return them accurately made out, with at least a quarter of the tax, by April 30. Forms may be obtained from a post office, Inspector of taxation, or an office of the Royal Trust Company. The booklet tells how to calculate your tax.

The sapota tree is the "chewing gum tree." Chicle is the proper name of the life blood of this tree from which the gum is made. It grows in South America, Central America and Mexico. It produces a fruit called the sapodilla pear, and has a straight, clear timber trunk.

Fire Prevention in Pulpwood by Means of Artificial Fog

By F. J. HOXIE, Boston.

Note.—The interesting address on Fire Prevention in Log Piles, which Mr. Hoxie gave at the annual meeting of the Technical Section, C. P. and P. A. in January, 1919, was published in the Pulp & Paper Magazine at the time, and is available as a reprint.

These two papers will form the basis for the discussion of another phase of the subject at the Technical Section, meeting January 19 and 20 in Montreal.

A large log pile fire presents an exceptionally difficult problem in fire protection engineering, in that many times as much quick burning fuel is present in a concentrated mass as is found in any form of building in which fires are commonly fought. The absence of walls and the exposed position and height of the log pile cause ideal draft conditions, so that the rate of combustion is ultimately limited only by the velocity at which air for combustion can be supplied to the fire and the products of combustion can be carried away. This velocity increases with the decrease in gas density caused by the rising temperature of the fire and is commonly called "draft."

Water Supply.

Very few of the large log pile fires have been extinguished by hose streams until the fuel has been practically exhausted owing to the amount of heat set free by the enormous velocity of combustion, therefore such a fire makes a formidable exposure to buildings or other nearby log piles, much more formidable from the fact that a fire in a log pile of from five to ten thousand cords has in nearly every case, continued two days or more whatever the water supply available. To fight such a fire with any chance of success not only must there be available an exceptionally large amount of water per minute but the supply must have such a capacity that it can be maintained at maximum volume for several days. In case of several large piles where a fire in one exposes the others, a continuous supply of from 3,000 to 5,000 gallons per minute for a week may be required to take care of sparks as well as the drying action of the heat in order to prevent the fire from spreading from pile to pile. For this purpose, pumps supplied from a river or other large body of water with an auxiliary gravity supply or a gravity supply through ample mains from a large reservoir is about the only practical arrangement. An auxiliary gravity supply of one or two hundred gallons for maintaining pressure constantly for quick service and supplying spray nozzles can be used in conjunction with pumps but a practically inexhaustible supply is unquestionably necessary for effective service.

Calculations based on the constant and high velocity of heat generation in large log pile fires which are confirmed by the lack of success in extinguishing such fires indicate that at least twenty to thirty gallons of water per minute would be required to extinguish a large log pile when well under way. Such supplies are nowhere available at present, therefore, when subdivision is to be relied upon as the chief of defense and the distances between the subdivided piles cannot be very great, a large and continuous water supply is specially important and it is well within the range of possibility that a fire may spread from one pile to another even after the wood in the first pile is nearly consumed as the radiated heat from the burning charcoal will be greater than that from burning wood and sparks will continue until nearly the end of the fire. The surfaces of nearby piles, unless they have been continuously and thoroughly wet will have been dried by the heat and be more easily ignitable. Moreover, as the number of piles is increased the surface subject to attack by exposure will be proportionately increased and the surface must be kept well wet down until the fire is completely extinguished, which, judging from past experience will probably be two or three days for each pile. If a second 10,000 cord pile should become ignited towards the end of the first fire it would require the water for nearly a week.

Subdivision.

Subdivision of pulp wood piles has two distinct objects, the first, underwriting and the second, engineering.

The object of subdivision from an underwriting standpoint is to reduce the value subject to a single loss to an amount which the companies writing the risk are willing or able to lose, however remote the possibility of a loss. With log piles, experience has shown that a total loss is probable if the fire gets a start, therefore the underwriting subdivision is more a function of the size and ability to pay on the part of the insurance companies than the chance of the loss occurring. This subdivision can be as well accomplished by dividing the risk among a large number of insurance companies as by subdividing the pile.

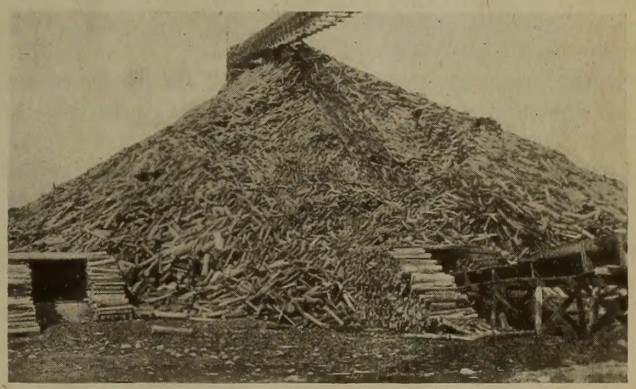


Figure 1.—Conveyor openings can serve as draft holes under a large log pile. This pile is being continuously wet by means of spray nozzles located on over-head conveyor and covering the most hazardous part of the pile. Water from this source which permeates down through the pile is constantly dripping inside these openings.

Subdivision from an engineering standpoint is governed by hazard and protection or in other words, the probability of a fire occurring within a given time and if it does occur the chance of putting it out with small loss. If subdivision is to be chiefly depended upon to safeguard a risk it should be such that each parcel subject to a single loss will not have a value greater than the average loss per fire in risks of all classes commonly written at the same rate and the separation of

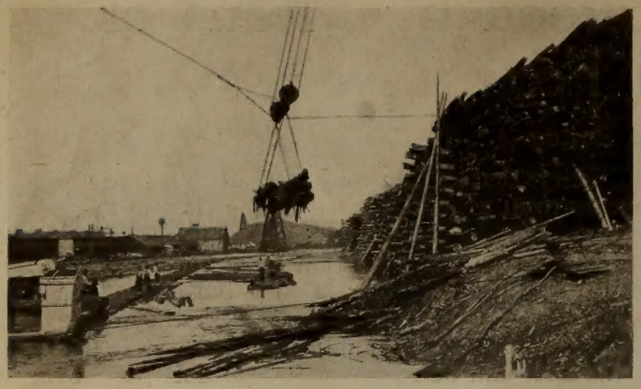


Figure 1.—Cable Conveyor stacking long low piles of long logs on the sloping hillside beside the river.

the several parcels should be such that there is no chance of a fire spreading from one parcel to another with the protection at hand.

Danger of Holes Under Log Piles Which Can Admit Air Under the Piles.

Any form of openings under a log pile which can serve as a draft hole to admit air rapidly under the base of the fire is dangerous (See figure 1) as it will greatly increase the velocity of combustion and may quickly lead the fire down into the pile where it will be impossible to get at it with water from any practicable position. Such holes are common about large log piles, being left to accommodate reclaiming conveyors and the return side of the conveyor cable. Provision should be made for keeping all such holes, when not in use, tightly closed to prevent the admission of air, and immediate attention should be given to stopping them with dirt, bark or logs in the early stages of a fire.

Location of Hose Streams and Monitor Nozzles for Most Effective Service.

There has been some discussion as to the relative advantage of locating hose streams or monitor nozzles on top of a log pile or about its base. There are advantages in both positions and doubtless in most cases part of the apparatus should be placed in each position but the top of the pile is preferable at the start of the fire when there is the greatest chance of success in extinguishing the fire. Provision should also be made for the men easily and quickly to attain this position.

At first thought the base of the pile may be considered preferable as the heat and smoke will make the top of the pile untenable after the fire is under way and it is thought that water can be shot with reasonably sure aim, like a gun, from a safe and convenient location on the ground. It has been assumed that the wind and air current will remain the same with the fire in progress. This is far from true. The first fifteen minutes of the fire is the only time that any really effective fighting can be done where a large pile of dry wood is involved, therefore to be able to get at the fire quickly with a sufficient amount of water is absolutely necessary for success. The best location in the early stages of the fire is unquestionably the top of the pile in all directions with the shortest range, less in-pile in all directions with the shortage range, less interference from wind and surer aim. After the fire is under way the updraft caused by the heat will be sufficient to deflect large hose streams sent up from the ground away from the base of the fire as the velocity of the water will be lost and it will come to rest in the air directly at the point where the updraft is greatest. The nearer to the fire the hose stream is located the greater possibilities there are penetrating this up draft by the force of the water and getting at the fire. With monitor nozzles or large hose connections distributed at short intervals along the top of the pile it will be possible to keep out of the smoke in the early stages when the up draft is less powerful and there is a chance of successfully extinguishing the fire, whereas, a few minutes later the chance of success is highly doubtful in any position.

Dry or Wet Wood.

Paper manufacturers prefer dry wood for making chemical pulp. This is sometimes obtained by piling in thin, well separated piles or by drying the chips but neither of these practices are common owing to the high cost of labor and other difficulties. Keeping the wood quite dry not only makes better pulp but reduces the loss from rotting, though wood kept continually very wet is not very likely to rot.

With the present high prices of wood more care will be used than in the past to prevent loss by both fire and rotting. In order to dry wood below the fiber saturation point of about 30 per cent moisture it is necessary to have the piles low with reference to the spaces between them, otherwise, they will absorb and retain sufficient water from rain to maintain the air in their neighborhood at nearly saturation which will retard the drying. With the great quantities of wood used in the larger paper mills it will require an immense area to store a sufficient supply for the time necessary to dry it by this method and stacking and recovery methods are expensive for such large areas.

Advantage may be taken of the slope of the land to distribute the wood from the top of an incline by sliding it from the cars at the top down inclined conveyors or shutes into long low piles and recovering it by continuing its course down hill to the wood room cars or conveyor at the bottom. Rough and tumble piles should not be over twenty-five feet high and twenty-five feet broad. With such a pile of barked wood on high ground where the lower average atmospheric moisture will hasten drying the moisture should be reduced to 20 per cent or less in a few months of dry weather. Ranked piles will doubtless be better. Such low piles, if well separated as will be required for efficient drying can be readily protected against fire by hose streams or monitor nozzles and the drying should be rapid enough to prevent loss from fungus for moderate periods of storage.



Figure 3.—Dark lines along the top of these log piles show the progress of rotting at the top of the pile where the fungus has been introduced by season cracks.

Cable conveyors have valuable possibilities for stacking long logs in low flat piles, convenient for drying and capable of effective hose stream protection as shown in Figure 2.

Dry wood can most advantageously be kept dry and wet wood kept wet. Wood received on cars which has been previously peeled and piled in the open for several months and has already dried to less than 50 per cent moisture can best be stored at the mill in such low piles as will prevent it from absorbing more water from rain. If dry wood is piled in large piles with wet wood it will take up water from the wet wood, both of them finally coming to a greater content of from 30 to 40 per cent which is the best amount for the rapid growth of wood destroying fungi.

Therefore, if the dry wood is piled separately in low, open piles as described above and the wet wood in high compact piles which are kept wet on the outside by water spray operating continuously in dry weather, both wet and dry wood will be kept as far as possible from the moisture content which causes the maximum rate of rotting and can be safely stored for the moderate time commonly required.

If it is necessary to store wood for several years it should either be stored in low, open, uniformly packed piles, protected on top to keep rain water out

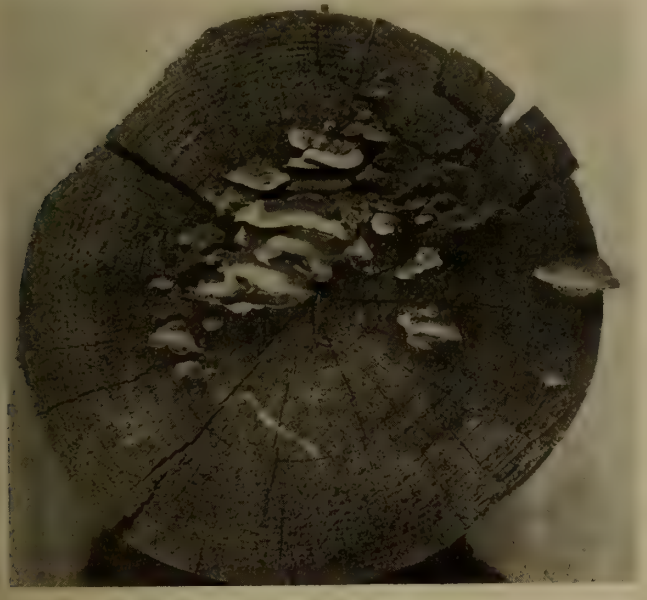


Figure 4.—Showing fungus plants encouraged by season cracks at the top of a log.

of the season cracks and well separated from the earth by rot proofed skids, or it can be stored under water.

Season cracks in logs on top of piles encourage fungus by admitting water to the centre of the stick. This condition is clearly shown in the following photographs, Figs. 3, 4, 5 and 6. Logs on the top of piles exposed to sun and air will dry down to less than 10 per cent of moisture. In so doing season cracks will open on the tops of the sticks admitting rain water and fungus. The latter will germinate and send out thread like growths which will puncture the wood cells, admitting water to the wood again so that the dry wood will reabsorb rain water, coming back to over 30 per cent, at first locally near the cracks, and gradually extending through the stick. It will be noted that in case of partially rotted sticks the fungus plants first appear at the top near the cracks. Fungus plants also appear at the bottom of the pile where nearest to



Figure 5.—Showing fungus plants from season cracks at the top of a log extending from the center of an evenly piled log pile. Note the dark top of the nearby log which extends only a short distance beyond the surface of the pile. The dark color is caused by the water absorbed through the season cracks and which is starting fungus growth.

the earth and lack of circulation of air maintains the wood at a moisture of 30 to 40 per cent which is favorable for fungus growth. (Figure 6.) Fungus plants on the surface of the wood, or so called fruiting bodies, shown in figures 5 and 6 are supported by thread-like roots which have already penetrated considerable of the wood before the fruiting plants appear. These fruiting plants do not commonly appear on originally sound wood until after two years or more of exposure to the weather. It is probable that if the wood on the top of the pile is kept saturated with moisture so that the season cracks cannot open the introduction of the fungus will be retarded.

Wood saturated with water so that its cells are completely filled will not rot and wood below 20 per cent of moisture is practically immune to fungus attack.

The exact moisture limits of the important wood-destroyng fungi are not known, but it is evident that the condition of most rapid fungus growth with common pulp woods is not far from the fiber saturation point, probably slightly above this point, or from 30 to 40 per cent moisture.



Figure 6.—Fungus plants on logs maintained at favorable moisture content by nearness to the ground.

(To be Continued.)

AGENTS.

Chas. A. Schieren Company, New York manufacturers of the well known "Duxbak" Leather Belting have appointed the Geo. F. Foss Machinery & Supply Co., Ltd., Montreal as their Eastern representatives and the Federal Engineering Company, Toronto as their Western representatives.

CANADA'S NOVEMBER EXPORTS 75 p.c. GREATER.

Canadian pulp and paper exports for November 1920, reached a total value of $14,355,435, compared with $8,016,990 in November, 1919, a gain of $6,338,445.

The exports of paper included 1,267,620 cwts. (63,381 tons) of newsprint, valued at $6,926,465; 5,292 cwts. (264 tons) of book paper, valued at $64,463, and other paper valued at $906,537.

Pulp exports included 183,102 cwts of sulphate, (kraft) valued at $1,123,967; 225,908 cwts of bleached sulphite, valued at $2,096,395; 336,403 cwts of unbleached sulphite, valued at $2,220,424, and 263,976 cwts of groundwood pulp, valued at $1,016,184.

The countries of destination were: Paper, United Kingdom, $233,667; United States, $6,202,816; other countries, $1,460,982. Pulp, United Kingdom, $192,749; United States, $6,009,739; Other countries, $254,482.

Unmanufactured pulpwood to the extent of 137,090 cords, valued at $1,948,241, was exported to the United States during the month, compared with 60,098 cords, valued at $635,361 exported in November, 1919.

For the first eight months of the current fiscal year, April, to November inclusive, pulp and paper exports were valued at $118,303,918 as compared with $64,626,540 in the corresponding months of 1919, and $53,954,984 in 1918, a gain of $53,677,378 over 1919 and of $64,348,934 over 1918. They exceeded by $13,668,580 the value of the total exports of pulp and paper for the entire preceding fiscal year,

A tabular summary is as follows:

EXPORTS OF PAPER, WOOD PULP AND PULP WOOD.

November, 1918 and 1920; and eight months ending November, 1918, 1919 and 1920.

Paper		Month of November		Eight months ended November		
Printing paper		1918	1920	1918	1919	1920
Book paper	Cwt.	1,933	5,292	.....	34,053	43,339
	$	19,787	64,463	.....	311,974	465,053
Newsprint paper	Cwt.	1,136,651	1,267,620	.....	9,056,677	10,093,150
	$	4,159,078	6,926,465	.....	32,203,392	49,602,092
Printing paper	Cwt.	.....	.....	8,506,975	.....	.....
	$	.....	.....	24,988,899	.....	.....
Other paper	$	732,649	906,537	3,897,241	5,470,310	8,984,338
Total paper	$	4,911,514	7,897,465	28,886,120	37,985,676	59,051,483
Wood pulp:						
Sulphate (Kraft)	Cwt.	234,990	183,102	.....	1,659,156	1,881,333
	$	761,283	1,123,967	.....	5,470,813	9,838,972
Sulphite, bleached	Cwt.	108,553	225,908	.....	724,645	1,481,032
	$	565,139	2,096,395	.....	3,618,103	11,949,010
Sulphite, unbleached	Cwt.	495,297	336,504	.....	3,230,244	4,012,432
	$	1,781,646	2,220,424	.....	11,993,486	23,823,302
Chemically prepared	Cwt.	.....	.....	6,133,191	.....	.....
	$	.....	.....	21,760,738	.....	.....
Mechanically prepared	Cwt.	894,206	263,976	2,611,854	5,081,276	4,249,605
	$	997,408	1,016,184	3,308,126	5,558,462	13,641,149
Total wood pulp	Cwt.	1,733,046	1,009,490	8,745,045	10,695,321	11,624,402
	$	4,105,476	6,456,970	25,068,864	26,640,864	59,252,433
Pulp Wood	Cord.	60,098	137,090	1,132,987	631,941	915,336
	$	635,361	1,948,241	10,846,864	6,321,540	11,504,496
Country of Destination.						
Paper and manufactures of—						
To United Kingdom	$	316,566	233,667	623,841	2,739,417	3,045,228
United States	$	4,265,065	6,202,816	24,041,595	30,921,516	46,270,092
Other Countries	$	329,883	1,460,982	4,220,684	4,324,743	9,736,163
Wood pulp—						
To United Kingdom	$	690,338	192,749	7,089	3,794,069	6,386,740
United States	$	3,041,832	6,009,739	22,800,989	19,818,130	49,291,301
Other Countries	$	373,306	254,482	2,260,786	3,028,665	3,574,392
Pulp wood—						
To United Kingdom	$	.....	.....	.....	.....	.....
United States	$	635,361	1,948,241	10,846,864	6,321,540	11,504,496
Other Countries	$	.....	.....	.....	.....	.....
Total Paper. Wood Pulp and Pulp Wood—						
To United Kingdom	$	1,006,904	426,416	630,930	6,533,486	9,431,968
United States	$	7,942,253	14,160,796	57,689,448	57,061,186	107,065,889
Other Countries	$	703,189	1,715,464	6,481,470	7,353,408	13,310,555
Totals	$	9,652,351	16,302,676	64,801,848	70,948,080	129,808,412

Facts About Present cost of Manufacturing Newsprint

Under this heading, the International Paper Company reviews the principal factors which affect the price of newsprint paper. This summary will be helpful in understanding the present situation.

In the latter part of 1918 this company issued a pamphlet entitled "Why Newsprint is High," which showed at a glance the enormous increases from a pre-war normal level up to that time in the cost of all elements involved in the manufacture of newsprint.

In spite of the ending of the war two years ago the curve of costs has continued to rise, and this compilation has been prepared to bring the story of increased manufacturing costs up to the last quarter of 1920.

The economic readjustment which has been manifested in other industries is not yet evident in newsprint manufacture.

Pulp Wood.

As wood pulps constitute about 98 per cent. of newsprint, wood to-day is the largest item of cost in the manufacture of that commodity.

An average of a cord and a half of rough wood, weighing approximately 6,600 pounds, is consumed in the manufacture of one ton of paper.

Prior to 1910, the average of prepared wood at the different mills of this company for several years was about $10 a cord.

For the next five years, 1910-1915, it averaged between $12.50 and $13.50 a cord.

The following table gives at a glance the average cost of prepared wood delivered at the mills of this company:

Cost of Pulp Wood.

1915, $12.90; 1916, $14.00; 1917, $16.31; 1918, $23.93 1919, $25.73; 1920 (9 months), $29.07.

It is to be noted that the costs above are average costs and are the result of averaging the cost of the company's operations on its own lands and the purchases of pulp wood from dealers and contractors.

Prices for prepared wood delivered have run far in excess of the average cost for the nine months of 1920.

Actual purchases of prepared wood this year in quantities of from 8,000 to 25,000 cords, have been at prices ranging from $30.51 a cord to $37.78 a cord, while wood has been seriously offered at $40, f.o.b. cars, that, on a prepared basis, would cost in excess of $60 a cord at Hudson River plants.

Labor.

Next to pulpwood, labor represents the largest item of cost in the manufacture of paper.

Including its woodland operations, the International Paper Company furnishes employment for about 15,000 people. In its various mills and offices it employs regularly 7,000 and up.

The following table gives the number of employes, the annual production in tons and the annual payroll in the mills:

Year	Number Employed.	Tons Produced.	Annual Payroll.
1915	6,614	448,323	$ 3,894,073
1917	6,922	532,589	6,643,772
1918	6,762	472,668	8,265,939
1919	7,000	472,007	8,802,859
1920*	7,688	532,000	11,623,566

*Estimate based on record of six months.

Below are two tables which show the marked increase in the labor cost per ton of paper and the decreased production per capita since 1915:

1. Labor Cost per Ton.		2. Per Capita Production.	
1915	$ 8.68	1915	80.05 tons
1917	12.47	1917	76.94 "
1918	17.49	1918	69.90 "
1919	18.65	1919	67.43 "
1920	21.85	1920	69.20 "

Table No. 1 shows this year 152 per cent. increase over 1915 and 17 per cent. over 1919.

Table No. 2 shows a decline in efficiency of 13.5 per cent. from 1915 and 1 per cent. from 1918. There has been an increase of efficiency over 1919.

The percentages of decrease in efficiency do not tell the whole story. During the period considered, especially in the past three or four years, the company has spent large sums for labor-saving devices of all sorts which should be reflected by an increase in the output per employe.

Lower cost levels and a lower price for paper can come only from cheaper raw materials, the installation of labor-saving devices and increased efficiency.

Transportation.

About four tons of material have to be transported to the mills for every ton of paper manufactured. These four tons of material include pulpwood, coal, lime, sulphur, clay, resin, pulps and mill supplies and replacements like wires, felts and screens.

Prepared wood weighs about 4,500 pounds to the cord and will make about one ton of ground wood pulp, or about one-half a ton of sulphite pulp. In round numbers, a ton of coal is consumed for every ton of paper, partly for power and for cooking sulphite, but principally for drying the paper.

These facts explain the great volume of freight involved in the manufacture of paper.

Rail Freights.

Before the Government took over the operation of the railroads in 1918, the Interstate Commerce Commission had allowed one increase of 5 per cent. and one of 15 per cent. On June 25, 1918, the National Railway Administration made a further general increase of 25 per cent. This made a total average increase of 48 per cent.

The recent increase of 40 per cent. in the territory in which this company's mills are located makes a total increase of 107 per cent. in rail freights since January, 1918. In addition to this, the rate on Canadian roads has also recently increased 40 per cent., which affects all pulp wood shipped by rail from Ontario, Quebec and New Brunswick.

The freight bills of this company for 1919 totalled between $4,000,000 and $4,500,000.

In 1920, because of the many embargoes, inability of the railroads to adequately handle traffic, lack of cars, etc., the cost to manufacture was considerably increased in addition to the actual freight paid. It was necessary to have men on the road tracing and rushing shipments and to have some material shipped at least part way by motor trucks. This condition was particularly noticeable in the winter months.

Because of the large quantity of raw material necessary to produce a ton of paper, the new freight increases effective August 26, 1920, will materially affect the cost of paper. This increase will amount to 40 per

cent. in our territory, which will result, it is estimated, in an increase in the costs of about $4 per ton.

Last year this company used 636,634 cords of wood which weighed about 1,432,427 tons. About two-thirds is shipped by rail. The cost to move by rail after the new rates are in effect will be about 107 per cent. greater than in 1917.

Last year, this company used 391,265 tons of coal. With the new rates, the cost of transporting it will have increased about 83 per cent. over 1917.

The increased cost of freight on all other materials like sulphur, lime, resin, ground wood, sulphite and mill supplies in general, amounts to over 95 per cent. over 1917.

The new rates above will mean an increase of $4 per ton in the cost of making paper, while the increased cost of transportation since 1917 will be $6.50 per ton of paper.

Mill Supplies.

The rise in the cost of mill supplies has continued since the Armistice. Prices had advanced enormously by 1915, but from that time to the Fall of 1918, the average increase in the cost of 18 vital articles and materials was 136.66 per cent., the smallest increase being 67 per cent., while the largest was 335 per cent.

In spite of the ending of the war two years ago, prices of most mill supplies have continued to advance.

The twelve articles and commodities in the following table show an average increase of prices current in August, 1920, over the prices of 1915 of 271 per cent., as against the average increase of 136.66 per cent. of 1918 noted above.

Mill Supplies.

	Price, 1915		Market price. August 1920	% Increase.
Alum	$ 1.085	cwt.	$ 3.25	200
Clay	3.15	ton	10.00	217
Coal (Anthracite)	2.47	ton	7.85	218
Coal (Bituminous)	3.84	ton	15.42	300
Lime	.30	cwt.	1.00	233
Cotton Felts	.24½	lb.	1.00	300
Woolen Felts	58.59	each	135.40	127
Wires	150.00	each	396.00	164
Rope	.11	lb.	.35	218
Resin	7.40	bbl.	25.00	238
Soda Ash	.55	cwt	3.75	591
Fuel Oil	.85	bbl.	4.65	447

Annual cost of	wires	has increased	$	328,000
" " "	felts	"	"	695,000
" " "	coal	"	"	3,074,150
" " "	fuel oil	"	"	2,089,725
" " "	pulp stones	"	"	39 per cent.

The annual cost of these supplies has increased $6,187,000 since 1915, which figures about $12.00 a ton of paper manufactured.

Losses and Risks.

The paper manufacturing industry suffers many losses which cannot be insured and faces daily risks against which it is impossible to secure indemnifying policies. These losses and risks are many and varied but fall usually under the following heads:

Destruction of standing timber by fires, insects and disease.

Loss of wood from breaking of booms, floods and decay.

Loss of production from strikes, lack of labor, low labor efficiency, explosion of digesters, breaking of grinding wheels; from lack of transportation for wood, coal, wires, felts and indispensable supplies. Also from fires, breakage of engines and bursting fly-wheels.

Loss from advances to contractors, of interest on large sums invested in wood, from compensation in case of accidents.

These losses occur irregularly, but with periodical certainty, and their large total has to be considered over a term of years to ascertain a practical annual average to apply to costs.

Uninsurable Losses for 10 years to January 1, 1918.

Strikes and labor troubles	$2,541,866
Losses from floods	533,726
Losses in pulpwood	265,300
Total losses	$3,340,892

This enormous total of uninsurable losses for 10 years made an annual average loss of $334,089, which had to be considered in the category of operating costs.

Since the above figures were compiled, the Niagara Mill of this company was forced to shut down on account of the commandeering of its water power early in 1918 by the Federal Government. There was no production for 283 days in 1918, and only 1,134 tons made in the last 21 days in 1919.

The normal capacity of the mill was 154 tons a day.

The actual loss to the company on account of overhead, necessary salaries and maintenance for the nearly two years was $595,028.72.

The average profits on newsprint for 1918 were $9.22 a ton; for 1919, $8.98 a ton.

This figures a loss of possible profits during the two years of $818,965.

The bud worm infeeted 1,300,000 acres of woodlands, destroying 15 per cent. of the standing timber. This is computed at 1,000,000 cords, and this, at the low stumpage valuation of $2.50 a cord figures a loss of $2,500,000, which cannot be replaced.

Recapitulation.

The facts have been classified in order to give the cost history of each branch of manufacturing.

Below is a summary of the facts presented:

Pulp Wood.—Pulp wood during nine months of 1920 has averaged 232 per cent. of the cost of 1915, and 125 per cent. of that of 1918, while the price has apparently not yet reached its peak.

Labor.—According to estimates for the year 1920, based on records of the first half, the manufacturing payroll for the year will be nearly 300 per cent. of that of 1915, and 140 per cent. of that of 1918, while the labor cost in a ton of paper has advanced from $8.68 in 1915 to $21.85 in 1920.

Transportation.—Freights increased 48 per cent. from 1915 to the middle of 1918. The recent increase makes a total advance of 107 per cent. over the 1915 schedules.

Mill Supplies.—The average increase in the prices of mill supplies from 1915 to the Fall of 1918 was 136.66 per cent. Now, two years after the Armistice, the average increase is 271 per cent. over the prices of 1915.

Losses and Risks.—For the ten years ending in the middle of 1918, uninsurable losses averaged $335,000 a year. Since January, 1918, the closing of the Niagara Mill, a strike in 1919, and ravages of the bud worm in the forests have caused actual and potential losses aggregating $4,366,395.64, or, at the rate of $2,183,197.82 a year.

Industrial Notes From Aboard

Revised from the original by Dr. Paul Bartholow for the Pulp and Paper Magazine.

A RAPID METHOD OF CONTROL ANALYSIS OF THE LIQUOR IN THE MANUFACTURE OF SULPHATE CELLULOSE.

By G. K. BERGMAN.

(Finsk Pappers—Och Travarutidskrift, Nov. 15, 1920)

This research is intended to establish a good working method of controlling the liquor during the processes of sulphate pulp making. The work is urgently desired, for the fact is that exact methods of analysis of these lyes are lacking, both in the large hand-books and in the more popular trade articles. Hence an exact analytical method is now set forth, beginning with a comparison of the values of amplified processes.

In a work recently published Schwalbe and Sieber (Die chemische Betriebskontrolle in der Zellstoff und Papier-industrie, Berlin 1919), supply a number of methods suited for the case in question, but the collection or summary is somewhat marred by errors in printing and in the citations of the sources of information. The white liquor, which is employed in the manufacture of sulphate pulp, consists, as we know, of a mixture of sodium hydroxide and sodium sulphide as chief constituents, together with some sodium carbonate, small quantities of sodium silicate, or thiosulphate, and a greater or less proportion of sodium sulphate. The white liquor is prepared from a solution of fused soda, the so-called "solution" causticised with lime. Thus the "solution" contains as its principal components, carbonate and sulphide with silicate and sulphite, but also some hydroxide, the last named on the ground that a portion of the water from the molecule is led back into the solution.

To determine the various anions in these solutions Lunge and Lohofer in 1904 worked out a method which seems to be in all respects suited to the purpose. Briefly it consists, partly in titrating the alkalies with acids, using phenolphthalein and methyl orange as indicators, partly in iodometric titration of the whole quantity of sulphide and sulphite; then the sulphite alone was titrated, and, further, after distillation in the usual manner and treatment with hydrochloric acid, the silicic acid was estimated by quantitative analysis as SiO_2 together with sulphuric acid precipitated and determined in the filtrate as $BaSO_4$.

I have already pointed out that the method as a whole is not suited for control during the course of actual operation, since a number of daily tests must be made in a short time. Kirchner's method has the same fault; it is really an adaptation of Lunge's method for the analysis of Le Blanc's raw soda, though contrary to Lunge's practice, the sulphides are titrated with a silver solution.

According to Lunge and Lohofer by titration with acids or hydrochloric acid, using methyl orange as indicator, nearly the total alkali in the liquor is determined, namely:

I. $Na_2CO_3+Na\ OH+Na_2S+Na_2SiO_3+\frac{1}{2}Na_2SO_3$

on the other hand, by titration with phenolphthlein as indicator—

II. $\frac{1}{2}Na_2CO_3+Na\ OH+\frac{1}{2}Na_2S+Na_2SiO_3$

This result we may amplify as follows. Taking into account the fact that the quantity of silicate in cellulose produced from wood is relatively negligible, and that the proportion of sulphite is likewise insignificant, a simple, approximate determination of the principal constituents of the lye, may be effected by titrating with methyl orange as indicator—

I. $Na_2CO_3+Na\ OH+Na_2S$.

with phenolphthalein as indicator—

II. $\frac{1}{2}Na_2CO_3+Na\ OH+\frac{1}{2}Na_2S$.

To determine the three unknown quantities, Na_2CO_3, Na OH and Na_2S, we require three equations. The three equations are obtained by determining the sulphides. Hence, titrating with iodine solution we obtain three equations, comprising the values for sulphides—

III. Na_2S.

However, the problem can be solved in a simpler manner by using simply one solution or acid titration. For this purpose we made use of the well known method of determining caustic alkalies in the presence of carbonate by means of titration with acids after the addition of an excess of barium chloride solution; whereupon we determined, using phenolpththalein as indicator—

IV. $Na\ OH+\frac{1}{2}Na_2S$.

Depending upon how we wish to combine three of the foregoing reactions, we proceed to some other processes by determining and estimating the carbonate, hydroxide and sulphide. This was done by means of titrations giving the quantities required in cubic centimeters of normal solutions per definite amounts of lye, for example, thus:

10 c.c. of lye titrated with acid, methyl orange *a* c.c. n/1; 10 c.c. of lye titrated with acid, phenolphthalein *b* c.c., n/1; 10 c.c. of lye titrated with acid, barium chloride & phenolphthalein *c* c.c. n/1; 10 c.c. of lye titrated with acid, iodine *d* c.c. n/1; we obtained the following results, and from the estimated values of Na_2CO_3, Na OH, and Na_2S in 10 c.c. of lye, expressed by a, b, c, d.

Simple Alkaline Titrations.

I. $Na_2CO_3+Na\ OH+Na_2S=a$.
II. $\frac{1}{2}Na_2CO_3+Na\ OH+\frac{1}{2}Na_2S=b$.
IV. $Na\ OH+\frac{1}{2}Na_2S=c$.

$Na_2CO_3=2\ (b-c)$ c.c. n/1.
$Na\ OH=2\ (b-a)$ c.c. n/1.
$Na_2S=2\ (a+c-2b)$ c.c. n/1.

Alkaline and Iodometric Titrations.

A(
1. $Na_2CO_3+Na\ OH\ Na_2S=a$ c.c. n/1.
II. $Na_2CO_3+Na\ OH+\frac{1}{2}Na_2S=b$ c.c. n/1.
III. $Na_2S=d$ c.c. n/1.

$Na_2CO_3=2\ (a-b)-d$ c.c. n/1.
$Na\ OH=2b-a$ c.c. n/1.
$Na_2S=d$ c.c. n/1.

B(
I. $Na_2CO_3+Na\ OH+Na_2S=a$ c.c. n/1.
III. $Na_2S=d$ c.c. n/1.
IV. $Na\ OH+\frac{1}{2}Na_2S=c$ c.c. n/1.

$Na_2CO_3=a-c-\frac{1}{2}d$ c.c. n/1.
$Na\ OH=c-\frac{1}{2}d$ c.c. n/1.
$Na_2S=d$ c.c. n/1.

Of these three formulas the alkalimetric method is, without doubt, the simplest, since it requires only one solution for titration and two indicators, which is an unquestionable advantage in mill control. Lunge and Lohofer have launched their anathema against the employment of barium chloride in the presence of silicate, and point out that only a portion of the silicate, 50--60%, is precipitated from the solution. Lunge in his well known handbook, "Chemisch-technische Untersuchungsmethoden," observes that, with methyl orange, the hydroxides plus the "total" sulphides are titrated, but with phenolphthalein, on the contrary, the hydroxides plus "half" the sulphides. Christiansen (Uber Natronzellstoff, p. 45) makes the same error, and, regrettable as it is, in the determination of the active alkalies in the lye for cellulose making.

Our investigations, therefore, are intended to explain how far the methods given above are to be employed, and to what extent they differ from the values which, according to Lunge and Lohofer, are exact.

The analysis was carried out in the following manner:—

From the original lye 100 c.c. are pipetted off, and diluted to 1 liter with cold water as free from air as possible. The solution is filtered. For the alkalimetric determination 100 c.c. (10 c.c. of the original lye) are pipetted off and cooled; titrated with hydrochloric acid and phenolphthalein added while the flask is stationary. When the end-point is approached, acid is added drop by drop while the action is constantly watched, and with sufficiently long intervals between the drops. When no shade of rose color can be seen in the solution, the values used are noted in c.c. These are $=b$. The titrations are then continued in the same manner after the addition of methyl orange and titrated to rose. This result $=a$.

Direct titration with phenolphthalein as indicator after the addition of barium chloride produced no precipitate, with others have mentioned (Kuster, Zeitschr. f. anorg. Chemie 127, 1897); otherwise the process was carried out as in the determination of *b*. The result gives the value of *c*.

For the determination of sulphides, or the value of *d*., 50 c.c. of n/10 iodine solution were pipetted off, acidified with acetic acid, and 25 c.c. of the lye, diluted in the described manner, were added to the solution. An excess of iodine solution is present at this point, and is titrated again with n/10 of a solution of sodium thiosulphate or sodium arsenite. The result is estimated on 100 c.c. of dilute lye, and the value thus found $=d$. As material for the analysis various samples of soda lye and white liquor from sulphate cellulose mills were used.

According to the tabulated results the proportion of silicate and sulphite in these lyes is not particularly significant. The error caused by leaving these quantities undetermined is therefore not great. If the quantities of silicate and sulphite remain constant during working conditions, the results of the analyses are most satisfactory in bringing to light the changes of values of the chief constituents, hydroxide, sulphide, and carbonate. In a purely mathematical manner we can easily see how our errors can be smoothed out and how they tend to accumulate. For example in estimating carbonate according to the formula $Na_2CO_3 = 2(a-b)$—d, and using the alkali-iodometric method A, a constant total is obtained, depending however upon the observation that silicate and sulphite, if present in sufficient quantities, are wholly or partly eliminated. On the other hand it is easily shown that values of carbonate by the alkalimetric method $Na_2CO_3=2(b-c)$, in most cases, work out very high, the error being introduced by the quantity of silicate. In such cases two chemical factors take a part, namely, in titrating carbonate with phenolphthalein as indicator the end-point seldom occurs exactly, since half of the carbonate is neutralized—a circumstance that lies outside the scope of this article—and the inaccuracy, previously mentioned, of the barium chloride method.

That the quantity of sulphide, as determined by d, of the iodometric titration, always works out too high, owing to the proportion of sulphite in the liquor, lies in the nature of things. For a correction of this error, however, we can go to control determinations of silicate and sulphite, easily showing in this way whether the error exceeds reasonable limits, and arriving at true values.

In most mills the method of working is the determination of causticity. To determine the caustic strength of soda lye, the liquor is treated with phenolphthalein and methyl orange as indicators and the ratio between the quantities of normal acid is estimated, expressed in per cent, or, in other words, we calculate, according to the determinations given above the value of 100b — a; the greater this number, the higher the causticity.

A solution of pure sodium carbonate, according to the calculation 100 b — a, has a theoretical causticity of 50 per cent. From this it follows that a lye cannot be found with a causticity less than 50 per cent, although such a lye is not in itself wholly active as caustic. In the pure sodium carbonate process this method of estimation is, therefore, nearly without significance; expressed as 100 (2b--a) — a, it gives the correct value. In the sulphate process matters are somewhat different. Here sulphides are present, which are estimated with the active alkalies. In this case, if the quantity of sulphide in the lye is equivalent to the quantity of soda, the formula 100b — a gives the correct value of causticity. If the quantity of soda is considerably higher than the quantity of sulphide, the result of the titrations gives a higher caustic value, and, conversely, if the quantity of soda is lower, a lower causticity. Thus it depends upon the ruling conditions, whether the method gives correct or incorrect results.

By causticity is meant the ratio of active to total alkali.

PROCESS FOR MAKING BRIGHT, WHITE GROUND WOOD PULP.

The grinding of wood for paper making follows a purely mechanical preparation—peeling, removal of the branches, rotten and diseased portions. The fibres are softer when the wood is cooked or steamed before grinding. If it is cooked in water at a temperature not above 100 deg. C., a bright pulp is obtained. Cooked at temperature above 100 deg. C., and under a pressure of 3--4 atmospheres, the fibrous mass is brown, suitable for making tough boards. By the patent Enge process, a pulp can be obtained that is at once tougher, whiter and more colorless, although the temperature employed rises above 100 deg. C.

According to the patent, after preliminary treatment of the ground wood with hot water under pressure in a closed receptacle, a white pulp is obtained even at a

temperature of 125 deg. C., and when the pressure maintained is higher than the steam pressure. Two to three hours' treatment is sufficient. The preliminary treatment of the wood with water under 100 deg. C., in a closed vessel has been proposed already for the production of a white pulp. But this process requires several days, while by the new method, a few hours only are taken, and a much better and tougher pulp is yielded. By the application of high hydraulic pressure the decolorizing of the wood is considerably delayed, so that, for example, at a temperature of 120 deg. C. and an hydraulic pressure of 10 atmospheres, a pulp is produced which, after the ordinary blueing, can only be made into print paper. But in this new process it is immaterial whether the stock is brought to the temperature of treatment first and, then, subjected to pressure, or whether it is subjected to pressure first and then brought to the temperature of treatment. For eaxmple, the filled receptacle can be brought to a temperature of 110 deg. C. by the copious introduction of dry steam; the steam is then turned off and the pressure in the receptacle raised to 10--13 atmospheres by pumping up hot water, whereby the further boiling of the water is prevented. The wood is exposed during as short as possible to a temperature above 100 deg. C. and to a corresponding steam pressure in order to delay the decolorization. With pressures of 10--13 atmospheres water penetrates the wood cells at the maximum rate of speed, while lower pressures necessitate a longer treatment.

Pulp produced by this process is suited for glazed papers, for under the microscope, the cellulose shows no chips; it is soft and flexible in all its portions. In addition pulpwood may be softened by treatment with water under 100 deg. C. in such a manner that it is more easily ground, with a saving of time, and yielding white pulp, which is capable of immediate manufacture into paper and strong boards. This is effected according to German patent 288,717 by treating the wood with hot water in a closed vessel under pressure. In this way thorough and even penetration of the wood by water is attained, a result not accomplished by the ordinary cooking process. The filled vessel is subjected to steam or air pressure, or the required pressure is produced by means of a pump. The dry empty receptacle is packed with stock, and then steam is run in until a temperature of 100 deg. C. is reached, when water is forced in by means of a pump, until the desired high pressure is produced. To shorten the process a pressure of over 5 atmospheres is recommended. When the wood is thoroughly permeated by water, which is the case in a few hours at pressures of 10 atmospheres, a great economy of power for grinding is achieved. Moreover the paper made from such pulp requires very little steam for drying.

The penetration of the wood with a circulation of water at 100 deg. C. for the purpose of reducing the work of grinding and for the preparation of a flexible, tough and uncolored fibre, ean also be effected in other ways (Ger. pat. 315,679). The air is removed from the receptacle in which the wood is packed until a vacuum of about 50 per cent. is reached. The receptacle is then filled with water at 80 deg. C. until the wood is covered by the fluid. Above this a free space must still be provided. Owing to the vacuum the water begins to boil, while the air pump is at work during the entire process of cooking. Likewise the water must be kept at a medium temperature of 80 deg. C. by means of a heating device. In this process the wood is completely permeated by water at the end of 6-8 hours. The wood remains white, and a further advantage consists in the fact that the vessel or digester need not be so strongly made, as it has no pressure to withstand. — Papier-Markt, December, 1920.

PRODUCTION OF PAPER IN GERMANY.

The home demand for paper and boards, which continued to be unsatisfactory in September, improved during October. A set-off to the insufficient home orders is the somewhat greater foreign demand. The supply of coal in October was still inadequate; the shortage was the more acutely felt as conditions of water power were also bad. Many mills working with water power were forced to restrict their operations, in some cases, to close down entirely. From many quarters, also, complaints come of the lack of cars. —Wochenblatt fur PapierFabrikation, Nov. 20, 1920.

NEW PROCESS OF PRODUCING CELLULOSE FROM STRAW, WOOD, ETC.

Abstract of German Patent 306,325 granted to HEINRICH OEXMANN.

To effect greater economy of the alkalies of higher values may be attained in the following manner. The digestion of the material to be disintegrated is effected first with the weaker alkalies, and next when the acids, which are more readily set free, are in their uncombined state, the stronger alkalies are brought into the reaction, in order to produce a complete solution of the encrusting substances.

In practice, for the disintegration of of 100 kg, of straw, it has proved sufficient to cook them with 400--600 liters of water, and 5--6 kg. of caustic potash during an interval of 4--6 hours, with or without pressure; 4 kg. of caustic soda are then added to the lye, and the whole cooked for another 4 hours. The stock is washed off and subjected to further treatment in the usual manner; and it was subsequently shown that straw treated by the method just described is, in all portions, of a value equal to that of straw treated with 9--10 kg. of caustic soda. (Caustic potash is about 5 times the price of caustic soda!—Ed.). It is best to allow the potash suspension to run out before the second cooking, for, by this means, the acids which combine in the first stage of the process are prevented from forming additional combinations with the stronger alkalies.—P.B.—From Wochenblatt fur Papierbrikation, November 27.

CHRISTMAS TREE AT CRABTREE MILLS.

A very pleasant evening was spent on Friday, December 24th, at the "Beaver S" Club, Crabtree Mills, where two hundred children, families of the employees, were entertained at their first annual Christmas Tree. The concert and entertainment were given by the children, under the direction of Miss Campbell, and it is indeed pleasing to note the progress the children are making who attend this school. Another interesting feature, which shows the loyalty of the employees of this Division, was their superintendent, Mr. Kay Crabtree was the recipient of a silver tea service and a case of pipes. The Reverend Father Archambault, on behalf of the employees, made the presentation.

FLYING STUDIES OF FORESTS AND INSECT DAMAGE.

If the Air Board of Canada can give a few more demonstrations of the time-economy of aircraft, such as occurred recently between Ottawa and Haileybury, Ontario, the stimulus to civil aviation will be materially strengthened.

Col. Robert Leckie, D.S.O., M.C., D.F.C., Superintendent of Flying Operations, Air Board, Ottawa, Mr. Clyde Leavitt, Chief Forester, Commission of Conservation, Ottawa, and Dr. J. M. Swaine, Chief of Division of Forest Insects, Entomological branch, Dept. of Agriculture, Ottawa, comprised the aerial party.

The plane left Ottawa at ten o'clock, a.m., following the Ottawa River to Mattawa, thence to North Bay arriving at 1.15 p.m. where a stop was made for dinner and a fresh supply of gasoline. At 2.45 the air travellers left North Bay, returning to Mattawa to follow the Ottawa River again, as far as Kipawa and up Lake Temiskaming, reaching Haileybury at 4.20 p.m. The actual flying time was five hours, at an average rate of 65 miles per hour. The engine is a 350 horsepower, twelve cylinder V type, stationary Liberty motor, and was used by the Naval Board during the war. The airship carries tanks with a capacity of 100 gallons of gasoline sufficient for about five hours constant flying. Her rate of consumption is 28 gallons of gasoline an hour.

The party was met at Haileybury by Capt. Wickens, deputed by the Air Board to operate the machine, while it is in that district, and by Mr. Roland D. Craig, Forest Engineer for the Commission of Conservation and Major G. H. Edgecombe, who are conducting a survey of the forest resources in Ontario, with the view of finding out the present and possible future supplies of timber from which the pulp and lumber industries of the province can be supplied. This work is under the direction of Mr. Craig, who conducted similar surveys in British Columbia. Major Edgecombe and Mr. A. V. Gilbert are also engaged in collecting the necessary information for this survey.

During the war the value of aircraft for mapping and reconnaissance was demonstrated, and now a number of planes are being used for this in forestry work in Canada. The Air Board having been given over 100 machines of different types by the Imperial Government is co-operating with the other Government departments by supplying machines and pilots for such work as mapping, forest fire protection, fisheries patrol and transportation.

Taking advantage of this opportunity, Messrs. Craig and Edgecombe are going to make reconnaissance of the forests in the Temiskaming district from the air, in connection with Dr. Swaine's Spruce Budworm studies.

The advance of the aerial survey is that it enables the observer to map in, with considerable accuracy, the various types, such as swamps, burns, hardwoods and softwoods, in a few hours on an area which could not be covered by a ground survey in as many months. It is not claimed that the amount of standing timber can be judged from the air, but with the area defined, a comparatively small amount of ground work will give a very satisfactory basis for a timber estimate.

Dr. Swaine is studying the injury caused by the outbreak of the spruce budworm which is spreading into Ontario pulpwood forests from Northern Quebec. The injury is to the balsam and spruce timber, and is caused by myriads of caterpillars devouring the foliage. The injured timber turns red and may be distinguished from the air. It is planned to map this area, and the timber owners can then be advised of the rate and direction of the spread, so that they may salvage their timber in advance of the outbreak.

Immense destruction has been caused by the spruce budworm in the Provinces of Quebec and New Brunswick, and this sudden extension of the outbreak into Ontario threatens all the spruce and balsam timber between Lake Temiskaming and the Great Lakes. In conjunction with the air survey, detailed entomological studies are being made by ground survey.

The plane and party remained in the north for about three weeks with Haileybury as the base. Col. Leckie returned to Ottawa in preparation for his flight across the continent from Halifax to Vancouver. On this trip he will come north as far as North Bay travelling from there in the direction of Georgian Bay and the Great Lakes. He was much taken up with the country covered and describes the Ottawa valley as a "wonderful sight" from the air.

Apart from their baggage, the flyers brought some personal mail from Ottawa to Capt. Wickens and Mr. Craig, which marks the first time in the history of the north country that mail has been brought by aeroplane.

NOBODY HURRIES A TURTLE.

By JOHN BLAKE.

Most men are irritated by a driving boss. It is natural to want to take our time—to do things in our own way.

The man who stands at our elbow, always urging us to speed up, annoys us. We resent his nagging. We feel that we could do much better if we were left alone.

But you will notice, if you are observing, that the boss doesn't waste much time urging hopeless laggards to work faster.

The reason he keeps after you is because he has found out that you are capable of speed. And if he can get it out of you, thereby teaching you to get it out of yourself, he has done you a service.

Nobody hurries a turtle. It would be utterly useless to do so. The turtle is utterly indifferent as to whether he ever gets anywhere or not. He speeds up only when falling off a log into the water, and then only when he fancies his life is in danger.

You ought to be complimented by the demand that you do more. It shows that there is something in you worth cultivating. Attention from the man higher up is a good thing. He wouldn't bestow it on you if you weren't worth it.

In these modern days speed in business is absolutely requisite. The leisurely methods of fifty years ago would drive any firm into bankruptcy.

"DO IT NOW" is posted in most offices, and for excellent reasons. Only by hurrying the work along can the inertia of the average business office be overcome.

Only by knowing that you have got to get things done in time can you escape the habit of procrastination, the most vicious and persistent that you can acquire.

Be cheerful when you are asked to accelerate a little. With practice you can learn to do it without being told. And when you can work rapidly and skilfully, you will soon begin to pull far ahead of the other starters in the particular race you are engaged in.

(Copyright, 1920, by John Blake).

WHAT CONSISTENCY MEANS.

A reader of the Pulp and Paper Magazine asks what is meant by the expression, "stock of 5 p.c., etc., consistency." Perhaps the following explanation will interest others who may also be puzzled.

The first point to have in mind is that the paper man considers dry stock to be what is known as "Air Dry". In this condition paper making fibres are assumed to contain 10 p.c. of moisture and 90 p.c. of bone dry solid material. This is approximately the proportion that would result by long exposure to normal atmospheric conditions. When it is stated therefor that the stock in a beater has a consistency or concentration of 5 p.c. or in a stuff chest 3 p.c. or at the screens 1 p.c., it means that 5 p.c. or 3 p.c. or 1 p.c. respectively of the total weight is air dry paper making material. There are cases where the concentration is greater and also where the concentration is less but the meaning is the same.

If we wish to determine accurately, the concentration of a certain stock we should have to remove all of the water because it is not possible to stop at a moisture content of 10 p.c. as there is no way of knowing when this point is reached. The procedure would be to take a sample after the stock had become thoroughly mixed ; to weigh accurately a certain amount, a convenient quantity would be 100 grams; squeeze out without loss of fibre as much water as could thus be conveniently removed, and then to dry the remainder where it would neither char not become contaminated, until there was no moisture left; in other words when two successive weighings of the residue were identical. This would not be air dry but what is known as bone dry fibre, the 10 p.c. of moisture having been removed with the bulk. Thus if we had started with 100 grams of a stock we should have left 4.5 grams of bone dry solid matter. This is the quantity that would be present in 5 grams of air dry stock since 5 grams of air dry stock would contain 10 p.c. of moisture and 90 p.c. of fibre, and 90 p.c. of 5 grams is 4.5 grams. It is obvious therefor, that if we wish to convert the bone dry residue into the equivalent quantity of air dry stock, we must divide by .9. For instance 4.5 grams divided by .9 equals 5 grams; and 5 grams is obviously 5 p.c. of 100 grams.

As another example, suppose we take from the flow box on the paper machine a sample of the stuff passing and weigh out a sample of 102.3 grams. This is completely dried in this case entirely by evaporation as it would be difficult otherwise to remove water without losing considerable fibre. The bone dry residue weighs .738 grams. From what we have said this must be divided by .9 in order to find the amount of air dry fibre. This, it will be observed, equals .820. The percentage of air dry fibre then in the machine stuff is .820 divided by 102.3, multiplied by 100, which gives 8 p.c. consistency. A properly used filter will remove the bulk of the moisture).

In papers which contain fillers this result will not be actually fibre but the actual fibre contained could be determined by burning. The final residue will be the loading and other mineral material contained in the paper.—J. N. S.

To deal in and manufacture all kinds of paper, pulp etc., the T. B. Little Company, Limited, has been granted incorporation with a capital stock of $200,000 and head office at Montreal. Montreal lawyers are named as the incorporators.

LORD BEAVERBROOK ON NEW BRUNSWICK.

Lord Beaverbrook is reported to have predicted great developments in New Brunswick pulp, and as having said that the Eastern province has enormous possibilities for the manufacture of pulp and paper from its wealth of spruce. A very informative article from the London Bureau of the Financial Times in this connection reads:

"New Brunswick's wealth", says Lord Beaverbrook, "largely consists in its enormous timber resources. The Provincial Government owns over 11,000 square miles of timber land. Though the principal wood is spruce, the province has devoted itself to the timber industry and has not taken up as it should the pulp and paper resources. This is accounted for to some extent by the lack of water-power in the province; but when one thinks of the magnificent water power at Grand Falls left undeveloped, the defense of lack of water-power seems insufficient to account for the neglect of an enterprise with such enormous possibilities as the manufacture of pulp and paper from the wealth of spruce possessed by the province. Besides the government timber lands there are hundreds of thousands of acres of timbered railway lands, freehold and undeveloped. The Americans complain of the embargo on export of timber cut on Crown lands, but here are the railway lands in New Brunswick, with no restrictions on the export, awaiting development.

"The future development of the world must be domiciled where there are natural resources. I look forward to a great future for New Brunswick because the Province has enormous natural resources—timber limits and power sites valuable beyond my power of calculation. Look through the pages of history to see where industry and enterprise have thrived, and you will find that they always prospered in places where there was abundant raw material that could be conveniently distributed. Newsprint can be distributed from any port, and New Brunswick seems to me to fulfill all the conditions for success. So I look for an enormous industrial development.

"The banks, with head office at Montreal and Toronto, which collect plenty of money in the province, are apt to become a little sticky when there is a question of making loans there. The banks seem to me to think too much of the west and to ignore the east. They lack proper perspective. Still there is much to hope for in New Brunswick, while we have men like Archibald Fraser developing the pulp and paper industry at Edmundston and on the Miramichi and Angus McLean, doing similar work on the Nepisiguit.

WAGES DROP IN N. B. WOODS.

St. John, N.B., January 3. — Wages in the lumber woods of New Brunswick have taken a big drop this year. The prevailing rate of pay at this time is sixty dollars per month, with board, whereas last year it was seventy-five or eighty dollars per month. In one camp a crew that had been receiving sixty dollars a month recently made a demand for ninety dollars. When the increases were refused, fifty quit the job at once, but their places were filled in short order by other men, who accepted the sixty dollar rate.

So far the pulp mills have been busy cutting their raw materials in the woods, but there are rumors afloat that these will shortly reduce their staffs.

A CONTRAST IN MILL CONDITIONS.

(From "The Paper Makers' Journal," Nov. 1920.)

The Editor has been greatly impressed with the splendid improvements made for the convenience and comfort of the employees in some of the mills; and the intent of others to provide for suitable accommodations, whereby the wage-earner is treated something like a human being, where the surroundings are fitted for human beings, as compared with the old way of things and the old order that is still in force in some localities, where the last thing some employers seem to think of, is the convenience or comfort of their employees.

The toilet accommodation in some mills, would be nothing to brag about if it were for the use of swine, and certainly deplorable to be used by human beings.

Very recently I had occasion to visit Glens Falls, New York, and visited the mill of the Finch-Pruyn Paper Company and was much impressed with the conveniences provided for the employees by that company. They have a wash room equipped with the most modern of plumbing; toilets, shower baths, etc., that would not be second to the equipment of some of the best hotels, but which would compare favorably with the best. Suitable lockers are provided in a sufficient number to accommodate the employees. These are on the first floor.

On the floor above, a cafeteria has been provided, in which any employee can get either a full meal or a light lunch at any time during the day or night. Chefs keep the cafeteria open from early in the morning until 2 a.m. the next morning; and between 2 a.m. and 7 a.m. a watchman or timekeeper would furnish food or coffee to any of the employees.

The furniture of this cafeteria is splendid.

This floor of the building is so constructed that it can be divided into three rooms, or by the use of folding doors it can be made into a big hall.

There are pool tables for the convenience and comfort of the employees, and many comfortable chairs, that those who wish to read or smoke may enjoy themselves. All these conveniences are open to the employees day and night.

The employees evidently appreciate this, as I am advised that they are holding a series of socials, and the money raised therefrom is set aside into a fund to be used in case of sickness or accident, not covered by the Compensation Law.

The whole system of dressing room, bath room, dining room, lockers and recreation room, is as clean and well kept as the best regulated hotel in the country.

Going into the mill one is impressed with the same cleanliness, and some effort made at improved machinery. On the machines they have an attachment for washing felts, in which it is claimed that the production of the machines is increased as they are not required to lose time during the day or night washing felts, as it is claimed for the attachment that the felts can be washed without even breaking the paper down on the machines.

The system simply is running warm water on the felt and drawing it out through a suction box with a very strong suction.

I have been asked if I think this system a success. My answer is that nothing will be a success that is not tried. There may be some difficulties that must be overcome. If the production, however, is sufficiently increased (considering quality, of course), to pay for the installation and operation, for without doubt, there is some power required to operate a suction pump, and the wear on the felts due to the use of suction boxes; my opinion is that it would be a success. Those matters, however, must enter into the subject in determining the success of the attachment.

The writer was impressed with another attachment and for the want of a better name, I think they are calling it a Silencer and Cleanser. The attachment is a round, hollow roll, full of holes, so that when the stock is flowing from the screen over the dividing board in the head box, it passes through this roll with the intent of breaking the currents, and in that way would get its name of "Silencer." In other words, the intent is to run the stock as evenly as possible through the vat, and just before it reaches the apron board it again passes through another roll having the same effect.

It is claimed by all the men on the machine that it doesn't gather lumps, and does materially help in causing a uniform sheet; eliminating to a great extent the waves and currents, while the paper is in the state of formation on the wire, which are so troublesome to the average paper maker.

The writer was in another mill, recently, and will refrain from using the name; but the contrast between the two mills was so noticeable, it is worthy of mention.

In the latter mill, upon entering, one is impressed with the absolute disregard of the value of the stock or the value of machinery or any of the parts thereof. What otherwise would be considered good, clean pulp, one would think was placed for the purpose of wiping muddy feet on it; and placed in a manner that one would have to climb over the pile. The machinery possibly had not been wiped up in a year, if ever, and from the appearance, would indicate never.

The men's clothing hung on the wall. When they changed clothing when going off tour, they had to do so right in the open. If anyone wanted to wear another's clothes, they could do so because they hung right on the wall.

There were no conveniences for keeping clean, no bath rooms, nor lockers; and the toilet one would hardly want to put pigs in.

The management gives as a reason, that they couldn't afford to spend the money for the necessary improvements and establishing a system by which stock and material would be saved.

My opinion is that the mill with the improvements, that has been kept clean, with thought of the employees, co-operation and successfully working out new improvements, is the more successful mill; much more successful than the mill in which seemingly there is no attention paid to sanitation, improved machinery, etc. There is no question in my mind but that if you were to ask the workman who had an opportunity of going to either mill of the two in question, to work, where he would rather work, his answer would be the "Clean" mill.

CATALOG RECEIVED.

The editor has received Catalog "F" which illustrates and describes the various types of Heaters, Condensers, Expansion Joints, Coolers, and Airjector Pumps, manufactured by the Ross Heater and Mfg. Co., Buffalo, N.Y.

LESS PAPER PRODUCED IN UNITED STATES.

The Federal Trade Commission reports the paper production for November, 1920, as 518,144 net tons. Comparisons with previous statements shows that this is the smallest monthly output of the year, as was expected in view of the decrease in business and the sharp curtailment throughout the industry. The November output was no less than 150,000 tons under the highest for the year of 658,518 tons in July. The production was 51,000 tons smaller than that for November, 1919, which was 569,484 tons, but was 40,000 tons greater than the 478,066 tons for November, 1918, and 26,000 tons more than the 492,975 tons monthly average for 1917, 1918 and 1919.

A survey of the statistics on causes for loss of output shows that 34 mills were completely closed down during the month, and that in addition other mills lost 155,232 work hours. Of this loss no less than 90,130 hours were lost on account of lack of orders. Repairs accounted for the loss of 30,327 hours, lack of labor for 342 hours, and lack of coal, water, power, etc., for 34,433 hours. The paper board industry lost the largest number of hours on account of poor business, 38,222 hours; the tissue mills lost 17,671 hours.

The following is a table of monthly comparisons aggregate tonnage:

	Tons.
November	518,144
October	621,964
September	643,018
August	654,158
July	658,518
June	657,322
May	645,413
April	634,402
March	641,343
February	654,500
January	650,293

Stocks of paper on hand increased during the month from 173,980 to 192,843 tons, a gain of about 19,000. This was but 9,000 tons above the stocks at the end of November, 1919, 3,000 above those for November, 1918, and 32,000 tons less than the average monthly holdings for 1917-18-19.

Stocks of all grades except news print, increased during the month. Stocks of all grades reported by manufacturers at the end of November amounted to 196,627 tons, including the stocks at terminal and delivery points. In addition to these stocks, jobbers and publishers reported news print stock and tonnage in transit aggregating 239,213 tons.

Comparing the stocks on hand at the domestic mills on November 30, with their average daily production for 1917, 1918 and 1919, the figures show that:

News print paper mill stocks equal less than 5 days' average output, book paper mill stocks equal about 8 days' average output, paper board mill stocks equal about 8 days' average output, wrapping paper mill stocks equal about 11 days' average output, bag paper mill stocks equal about 5 days' average output, fine paper mill stocks equal slightly less than 28 days' average output, tissue paper mill stocks equal slightly less than 18 days' average output, hanging paper mill stocks equal slightly more than 9 days' average output, felts and building paper mill stocks equal about 15 days average output, miscellaneous paper mill stocks equal slightly more than 21 days' average output, total paper mill stocks of all grades equal about 10 days' average output.

TECHNICAL ASSOCIATION NEWS.

Dr. Otto Kress, chairman of the Committee on Dyestuffs of the Technical Association of the Pulp and Paper Industry, who has been in charge of the section of pulp and paper at the Forest Products Laboratory, Madison, Wis., for several years past, will resign from the service early in the new year. He has accepted a responsible position with the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wisconsin, in which he expects to be kept very busy. The duties of his new position will prevent him from doing any work as chairman of the Dyestuffs Committee, and he has asked to be relieved and that a successor be appointed. The matter is now under consideration by President Hatch.

The Committee on Abstracts of Literature of the Technical Association, under Ross Campbell, American Writing Paper Company, Holyoke, Mass., chairman, is planning to have future abstracts published and indexed in the issues of Technical Association Papers. In co-operation with the Technical Section of the Canadian Pulp and Paper Association, the committee has covered practically all of the literature of interest to the paper industry since the time it was organized. To show how the work of the committee has grown, it may be mentioned that during the last quarter of 1918 about eight magazine pages of abstracts were published; fourteen pages appeared during 1919, and during the first three quarters of 1920 seventeen pages were printed.

Some interesting developments are promised by the Committee on Sulphite Pulp, of which W. E. Byron Baker, York Haven Paper Company, York Haven, Pa., is chairman. Mr. Baker is continuing work on the sulphite process along the lines indicated in his paper on the "Control of Sulphite Cooking" read at the last annual meeting of the association in New York. He hopes also to do some work on the recovery of by-products and will perhaps include some of these results in the annual reports of the committee. Mr. Baker has been giving some attention to the development of the new method of testing sulphite liquor so as to obtain a more complete and correct analysis. It is likely that some of his associates on the committee will collaborate with him in the work. Arrangements have been made for the translation from the Swedish for publication in Technical Association Papers of articles dealing with a variety of interesting subjects connected mainly with the utilization of sulphite waste liquors and sulphite cooking.

It is likely that the work of the Committee on Heat, Light and Power for report at the annual meeting next April will be confined to such subjects as "Pulverized Fuel" and "Steam Economy." A symposium on "Steam Economy" would, no doubt, bring out considerable discussion, as the subject is one that is almost unlimited in its scope. In regard to the question of "Pulverized Fuel," this is one on which little experimental data are available, and it may not elicit the same general discussion as the subject of "Steam Economy."

The Committee on Groundwood or Mechanical Pulp, of of which W. A. Munro of the Wisconsin River Paper and Pulp Company, Stevens Point, Wis., is chairman, has announced that it will discuss at the annual meeting next April "The Hall Process of Grinding Wood" which has been attracting considerable notice for some time past.

UNITED STATES NOTES

Leading forestry experts from all parts of the country and other interested parties met recently in Albany, N.Y. and formulated a program for forest fire prevention, reforestation and the elimination of all wastes that seriously threaten the supply of standing timber. The conference brought together State foresters, deans of Schools of Forestry and lumbermen, as well as wood and paper manufacturers. It was decided that the Federal Government should be called upon to take an active part in forest fire prevention. In view of the annual loss through fires of over $20,000,000 worth of standing timber Congress is to be asked to appropriate $1,000,000 for forest fire prevention, the allotment to each State being determined by the amount appropriated by the State itself for this purpose. The program called also for the formation of a National Forest Fire Prevention Committee which is to consist of five or more members from each State, representing the forestry profession, lumbering, wood-using and farming industries and organizations of commercial interests, women's clubs and similar associations. The purposes of this committee will be to inform the public concerning the need of a national forest fire prevention policy and to secure Federal and State legislation to that end. An executive committee was chosen, composed of the following: Geo. D. Pratt, New York Conservation Commissioner, chairman; H. A. Reynolds, Massachusetts Forestry Association, secretary; Col. Henry S. Graves, former United States Forester; Wm. T. Cox, State Forester, Minnesota, and J. E. Rhodes of the Southern Pine Association, New Orleans.

Salary bonuses amounting to more than $100,000 were given as Christmas presents to the employees of the Columbus (Ohio) "Despatch" and the "Ohio State Journal" and other employees of Robert F. and Harry P. Wolfe of Columbus. The bonuses covered the six months' period ending January 1, and were the second granted during the year.

Ferdinand Thum, inventor of "Tangle foot" sticky fly paper, died last week at his home, Passadena, Cal. Mr. Thum was 65 years old and many times a millionaire. He perfected his invention several decades ago in Grand Rapids, Mich.

Paper salesmen of the New England States will meet this Friday at a dinner to be given by their association at the Exchange Club in Boston. An interesting program has been arranged by the committee which includes the showing of an educational film picturing the process of paper making from pulp wood to the printing press. This reel of film is being loaned for the occasion by the International Paper Company.

Boston paper men had an opportunity last week to view the United States Department of Commerce exhibit of paper clothing which has already been shown elsewhere in the country since being brought over from Germany and Austria some weeks ago. Included in this exhibit are suits, trousers, overcoats, collars, aprons, raincoats, table-covers, rugs, laundry bags and other personal appurtenances. An exhibition of a similar nature has been opened to the paper trade by the J. L. N. Smythe Company of Philadelphia at the Smythe warehouse. This company has the exclusive agency in the United States for Windowphany, the paper used as a stained glass substitute. The articles shown in the exhibit in Philadelphia comprise numerous innovations in the line of paper substitutes for cloth. Manager C. L. Morian, who collected the exhibits during a recent trip in Europe, says that abroad these articles are not mere specimens of paper possibilities, but that, on the contrary, they have been serving as articles of commerce. Among the various specimens in Mr. Morian's collection is a bolt of paper cloth of beautiful blue color, looking very much like high grade burlap. A piece of this cloth was soaked in water over night and then dried on a steam radiator. It lost none of its strength or color. This cloth is utilized in the making of many useful as well as artistic products. It is the purpose of the Smythe firm in showing these paper fabric commodities to encourage American manufacture of similar articles.

The new mill of the Alaska Pulp and Paper Company at Snettisham has been completed and is preparing to turn out its first ground wood pulp, according to reports received by the Alaska bureau of the Seattle Chamber of Commerce. Further development plans, calling for the instalment of another mill five times the size of the present unit, will enable the company to turn out probably within the present year, at least 100 tons of pulp daily.

The Snell Forestry bill, which embraces substantially the recommendations of the wood using industries and interests chiefly concerned in forest conservation, was introduced in Congress just prior to the holiday recess. According to W. B. Bullock, who is assisting Secretary Kellogg of the Newsprint Service Bureau and Dr. Baker of the American Pulp and Paper Association in the promotion of this legislation, the bills progressing very satisfactorily.

Employees of the J. W. Butler Paper Company, Chicago, were presented with Christmas bonuses averaging about 30 per cent of their salaries. In addition to this, employees of the corporation branch were made gifts of free insurance policies ranging from $500 to $3000.

The Federal Power Commission has filed applications for permits looking toward the development of more than 12,000,000 horse power, sufficient to supply twenty cities the size of Chicago. Completion of the contemplated plans shown in the applications, the commission estimates, will advance water power development in the United States by more than 40 per cent, and will involve an investment of $1,200,000,000.

C. S. Battle, one of the leading timber men in British Columbia, was quoted in Seattle papers last week as saying that American engineers, representing financial interests of New York, Chicago and Buffalo, are investigating the pulp manufacturing possibilities in British Columbia with the object of investing from eight to ten million dollars in the pulp industry there. The investment would represent the taking over of five billion feet of the best stumpage of the province, Mr. Battle is reported to have said.

PULP AND PAPER NEWS

The plant of the Mattagami Pulp & Paper Company at Smooth Rock Falls has been closed down for a few weeks. According to a despatch from Cochrane average wages for bushmen then will be cut to $40 per month and board, this representing a considerable decrease in the scale formerly paid.

Mr. Alex. Buntin, of the Buntin Reid Company, Limited, Toronto, is spending a few weeks at Atlantic City.

The Ontario Division of the American Pulp and Paper Mill Superintendents Association will meet at the Clifton Hotel, Niagara Falls, on January 8th for the purpose of inaugurating the Ontario Division and the election and installation of officers. Among the addresses to be given are "Industrial relations in the Canadian pulp and paper industry", by Mr. A. P. Costigane; "The new conception of the purposes of industry", by Mr. Robert B. Wolf; "The conservation of heat units in the drying of paper" by Mr. F. C. Farnsworth, and "The development of the Fourdrinier machine" by Mr. Stuart D. Lansing. "A good deal of interest in the coming meeting has already been developed and a large attendance is expected.

Twenty-five sales department heads of the Copp-Clark Company enjoyed their annual social reunion and dinner at the Carls-Rite Hotel during Christmas week when there was a general exchange of ideas for 1921. Mr. H. L. Thompson, president of the company, presided.

The Dominion Envelope & Cartons, Limited, has been granted incorporation, with head office at Toronto and a capital stock of $1,000,000. The company is authorized to manufacture and deal in all kinds of paper, box-boards, envelopes, cartons, packages, boxes, bags, etc. Among the incorporators are F. A. Dewey, C. H. Bowyer, H. G. Smith and J. F. Boland, all of Toronto.

The Miller Bros. Company, Limited, has been granted Dominion incorporation with power to deal in and manufacture box-board, straw-board, wood pulp boards, bookbinders, board, etc., with a capital stock of $1,000,000 and the chief place of business Montreal. Among the incorporators are R. T. Heneker, H. N. Chauvin, Jean Martineau, T. S. Shearer Stewart and I. L. MacCallum.

At a recent meeting in St. Catharines, of the Lincoln Paper Mills Company, Limited, Vice-President A. S. Woodruff was appointed President in succession to the late W. D. Woodruff, whose death took place a couple of weeks ago. Dr. Thomas A. Woodruff was made Vice-President and Mrs. W. D. Woodruff was added to the Board of Directors.

In a fire that occurred in the building of the E. B. Shuttleworth Chemical Company, Victoria and Dundas Streets, Toronto, on December 24th, Hodder & Stoughton, the Musson Book Co., Ltd., and the Church Bible and Prayer Book Company, publishers, suffered severely. The building was entirely destroyed and while the loss was great most of it was covered by insurance.

W. J. Reynolds, foreman of the Brockville Record and Times, Brockville, Ont., has just celebrated his 47th anniversary as a member of the staff, never having been on any other paper. This is a record not surpassed, it is believed, by any other publication employee in Canada.

Walter C. Nichol, proprietor of the Province, Vancouver, and a former Toronto newspaper man, has been appointed Lieutenant-Governor of British Columbia.

Mr. W. F. V. Atkinson, of the Dryden Pulp and Paper Company, Dryden, Ont., who spent the Christmas holidays in Toronto states that 40,000 cords of pulpwood are being taken out by the organization this year. Some 700 men are engaged in the work and the wages paid are from $50 to $60 a month.

Howard Smith Paper Mills, Ltd., have just sent out a new folder showing printing effects in two and three colors on their principal lines of book papers: Bard of Aron, Byronic Book, De Luxe, Sea Gull, Louvain, and Velour Art. The first two are shown with deckle edge. Several different finishes are illustrated.

Big Wood Harvest.

Fifty thousand cords of pulp wood from the timber limits of the Meigs Pulpwood Company and allied interests in the Gaspe Peninsula, Province of Quebec, will be brought into this country through the part of Oswego by the Cornwall Terminal Company next year according to plans now being made. Of the entire amount 20,000 cords will be shipped out of Oswego by the Cornwall Terminal Company to mills in this State and the remaining 30,000 cords will go to a large mill in Pennsylvania.

High Prices For Pulp Wood.

Kingston, Ont. — Farmers from all sections of the Calabogie district have been busy since the opening of the sleighing season drawing pulpwood to Kingston, Ont. The first car was billed through to the big mill at Ticonderoga, New York. Any farmer who was fortunate enough to make a contract last winter for the year's output is paid $14 a cord, while those who waited in the hope of an increase in price, receive only $12. The freight on a car of pulpwood to the New York plant is $125 or about $8 a cord so that the wood delivered at the mill costs the manufacturer about $25 a cord, one reason for the excessive price of paper.

Papermakers' Union Fight To Open Shop.

The opposition of Eagle Lodge of Papermakers to the move of the Crocker-McElwain Company and the Chemical Paper Manufacturing Company, of Holyoke, Mass., for open shops is to be strengthened by the appearance on the scene of President Jeremiah T. Carey of the Papermakers' International Union, who will go to that city to direct the fight.

R. F. McElwain, president of the two companies, lately announced an offer of individual contracts based on the open shop principle by which employes of five years' standing would be transferred from the payroll to the salary list.

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. Progress in dendro-chemistry. H. O. CHUTE. Can. Chem. J., **4**, 217-28, (Aug. 1920). A review of the advances that have been made in the utilization of the products of the forest in Canada and the U. S. All chem. industries of the forest are by-products industries, or should be such, for nearly all woods are more valuable for timber and lumber than for their chem. products. The manuf. of ground wood, soda, sulfate and sulfite pulps are briefly described, and the other products of cellulose (esters, oxalic acid, etc.) are mentioned. N. America is unique in possessing the only deciduous tree that produces sugar in commercial quantities. The transformation of wood into sugars and alcohol has been known for over 100 yrs., but has only recently been successfully applied on a com. scale. The uses of the rarer gums and resins (Canada balsam, Oregon balsam, camphor, eucalyptol, oil of sweet birch, storax) are briefly dwelt upon, and also those of turpentine. The process of extg. tannins and dyeing exts. is described. The distn. of hardwood is described at some length, with special emphasis on the improvements initiated by the writer (U. S. patents No. 824,906, 835,501, (1906); 896,434, (1908).—A. P.-C.

A-1 Progress in dendro-chemistry. H. O. CHUTE. Can. Chem. J. **4**, 217-28, (Aug. 1920); Paper, **27**, No. 6, 16-9, 28, (Oct. 13, 1920).—A.P.C.

A-1. Some observations on the determination of cellulose in wood. S. A. MAHOOD, Forest Products Lab., Madison, Wis. J. Ind. & Eng. Chem., **12**, 873-5, (Sept. 1920). A uniform size of particle is essential if comparable results are to be obtained in the detn. of cellulose in woods. Material which passes an 80-mesh standard (Am. Soc. of Civil Engineers) sieve, but is retained on a 100-mesh sieve has been found to be most satisfactory from the standpoint of both yield and manipulation. Material obtained by a single mechanical process of disintegration may give a sample on sifting which is not representative. To avoid this a combination of 2 processes, sawing and grinding, has been used. The procedure recommended by Sieber and Walter for chlorination gives a lower yield of cellulose than the original Cross and Bevan method, probably because of the higher temp. at which chlorination takes place. The modification of the Cross and Bevan method by Johnsen and Hovey appears to be of doubtful value.—A. P.-C.

A-1. Lignin. III. Preparation of a tannic acid from lignosulfonic acids. M. HONIG and W. FUCHS. Monatsh. Chem., **41**, 215-22, (1920); J. Soc. Chem. Ind., **39**, 718A, (Nov. 15, 1920). (See also Pulp & Paper, **18**, 1238. A-1, Dec. 2, 1920). The Ba salts of the fractions of the lignosulfonic acids are converted by boiling aqueous $Ba(OH)_2$ soln. into diff. insol. compds., which have not been identified, and a single sol. salt, $C_{18}H_{30}O_{10}SBa$, the acid corresponding to which has the character of a tannic acid of the catechu group with properties which are somewhat modified by the S content; when fused with KOH, it gives proto-catehuic acid in good yield.—A. P.-C.

A-3. Lignified and sub-lignified plants suitable for papermaking. CH. GROUD. Papier, **23**, 217-21, (Oct. 1920). A suggestion that various Fr. plants be utilized for papermaking and other purposes. Osier-peel is a rather strong fibrous material and contains an appreciable amount of tannin and of salicin (a glucoside used as a quinine substitute) which is easily extd. with boiling water. Heather, broom, and gorse grow very abundantly in France and are suitable for papermaking. Gorse contains 0.8 per cent of a diuretic resin, and also a poisonous alkaloid, cytisine, which is present in small amounts in the green portions of the plant and up to 2.5 per cent in the seed. Spanish broom (**Spartium jonceum**) is used in certain parts of Italy for the manuf. or very light hand-made textiles, cordages, and papers. If the fiber is prepd. mechanically it is neither long enough nor strong enough to be used as a textile but can be used for papermaking. —A. P.-C.

A-14; K-23. The yellowing of (photographic) copying paper and its method of prevention. F. FORMSTECHER. Phot. Rundsch., **56**, 75-7, 92-3, (1919); Chimie et Industrie, **4**, 510, (Oct. 1920). The author has investigated the causes of the yellowing which direct contact papers undergo in time, and has found out that H_2S, to which this deterioration is often ascribed, is but exceptionally the cause. All direct contact papers contain a complex of which the main constituents are AgCl and a soluble Ag salt. This complex blackens in the dark under the action of moisture. The pink coloration assumed in time by self-toning papers is of a similar nature. A slight yellowing of the paper completely disappears on fixing the proof. The yellow Ag is dissolved by the $Na_2S_2O_3$ and the oxidizing action of the air in the presence of CO_2. Moreover, in certain cases the free acid remaining in incompletely washed paper might suffice to dissolve the Ag_2O. Hence, a combined acid toning-fixing bath should be used for yellowed paper, as separate toning and fixing are useless. When the paper has turned considerably yellow it is unfit for use. The main condition requisite for yellowing is the presence of water, even though present in very minute amount, in the coating of the paper; for without water no chemical reaction can take place in the coating. This water comes principally from the paper on which the emulsion is coated, and it would therefore seem that the best way of preventing yellowing would be to eliminate the water as much as possible. This can be accomplished by packing the paper in air-tight metal containers containing $CaCl_2$. Not only is this method cumbersome, but it overdried the paper and renders it brittle. The following method is better and more practical. The sheets of paper are packed 2 by 2 with the sensitized faces in contact, and between each pair is interposed a thin paper, having a fiberless structure as far as possible. The main function of this paper is that of

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moisture regulator, and it must absorb moisture more readily than the sensitized paper. It must not give off any harmful substances and must be free from rosin, for rosin hastens the yellowing. A slightly alkaline reaction of the intercalated paper tends to prevent. The yellowing of copying paper and its method of prevention, yellowing, for which reason chemically pure tissue paper soaked in a soda solution was formerly used. Nowadays straw paper is used; it is free from rosin, slightly alkaline, but slightly hygroscopic, and does not store up actinic rays as does white paper.—A. P.-C.

A-15. The chemistry of cellulose and its compounds from the colloidal standpoint. GUSTAVUS J. ESSELEN Jr., A. D. Little, Inc. Chem. Met. Eng., **28**, 861-6, (Nov. 3, 1920). A concise descriptive summary of structure, electrical and general chemical properties, hydration, and oxycellulose; of the action of H_2SO_4, $ZnCl_2$, ammoniacal copper oxide, CS_2 and NaOH, HNO_3 and AcOH; together with a discussion of the viscosity of cellulose acetate solutions.—A. P.-C.

A-15. Accelerated method of estimating the reducing values of cellulosic substances. E. KNECHT and L. THOMPSON, J. Soc. Dyers and Col., **36**, 255-1, (1920); J. Soc. Chem. Ind., **39**, 718A, (Nov. 15, 1920). The Schwalbe method for detg. the Cu no. of oxycelluloses is modified by dissolving the pptd. Cu_2O in a ferric salt solution and estimating the ferrous salt so produced with $KMnO_4$. A confirmatory value is obtained by estimating the unreduced Cu in the filtrate with titanous chloride, and the diff. between the 2 values is equal to the Cu hydrate no. (unreduced Cu absorbed by all celluloses). The 2 methods give nearly identical results, which are slightly lower than that obtained by the original Schwalbe method. The possible effect which the alkalinity of Fehling's solution may have on oxycellulose may be avoided by heating the oxycellulose with a solution of $Cu(CNS)_2$ containing Na_2CO_3, treating the ppt. of CuCNS with warm NaOH, and estimating the Cu_2O so formed with a solution of ferric salt and $KMnO_4$. The method is less liable to error, but the Cu no. so obtained is slightly high. The Cu no. was shown to be a reliable criterion of the reducing power of cellulose, by heating oxycellulose with NaOH and rosinduline and then titrating with titanous chloride.—A. P.-C.

A-15; L-5. Preparation and properties of a highly oxidized cellulose. E. KNECHT and L. THOMPSON. J. Soc. Dyers and Col., **36**, 251-5, (1920); J. Soc. Chem. Ind., **39**, 718A, (Nov. 15, 1920). Previous methods for prepg. oxycellulose are open to criticism, since it takes no account of its decomposition by alkalis into non-reducing substances, and its hydrolysis by acids. An oxycellulose is obtained by treating filter paper with an acid solution of $KMnO_4$ (either 1 or 2 atoms of O to 1 mol. of $C_6H_{10}O_5$), washing the brown powder so formed, decolorizing with H_2O_2, and drying at a temperature not exceeding 40 deg. C. This oxycellulose has strong reducing power, especially in the presence of alkalis, and reduces methylene blue, safranine, rosinduline, indigo, and indanthrene in the presence of NoOH. Thus, the formation of oxycellulose may acct. for the well-known bleeding of indanthrene and vat colors during kier boiling. It reduces solutions of Ag, Cu'', and Ferric salts. With NH_3 and $NaHSO_3$ it forms unstable compounds. A strong yellow color develops with NaOH, and on neutralizing the solution and acid cellulose is pptd. which has only slightly reducing power. It is not possible to estimate oxycellulose by means of its reaction with p-nitrophenylhydrazine, since only adsorption compounds are formed. The new oxycellulose has a Cu no. of 14.2 as compared with 7.6 for Nastjukoff's bleaching powder oxycellulose.—A. P.-C.

E-0. Swedish sulfite pulp industry. Z. angew. Chem. Sept. 3, 1920; J. Soc. Chem. Ind., **39**, 341R, (Oct. 15, 1920). The production, which had fallen from 771,302 metric t. in 1916 to 476,307 t. in 1918, has now risen to 581,167 t., which represents 69 per cent of the normal. The demand for sulfite, especially on the part of the British paper manufacturers is good. The increased demand may be partly accounted for by the total absence of the Canadian supply, which is being wholly absorbed by the U. S. market.—A. P.-C.

F-0. The manufacture of pulp by the electrolysis of NaCl solutions. RAYMOND FOURNIER. Papier, **23**, 225-6, (Oct. 1920). The manufacture of pulp by the electrolysis of a NaCl solution is by no means new. It is mentioned by H. de Montessus de Ballore in his book on the manufacture of paper pulp (published 1913) and was patented by Karl Kellner. The process did not give good results, for there are certain difficulties which have not been overcome, the chief of which is as follows: when operating in the cold, the action of the Cl is satisfactory, but the NaOH is not sufficiently active; when operating at a high temperature, either with or without press. the action of the NaOH is satisfactory, but that of the Cl too energetic. (See also Fr. patent No. 503,749, G. A. Mourlaque, (Gironde), France, March 24, 1920. Papier, **23**, 151-2, (July 1920); Papeterie **42**, 691, (Aug. 10, 1920).—A. P.-C.

K-6. Results of laboratory tests by "Cellulose et Papiers" in connection with pulp and paper making. A. LECHATELIER. Chimie et Industrie, **4**, 529-42, (Oct. 1920). Preliminary tests made in June-Nov. 1916 showed the advisability of using material which could be treated without press. rather than wood. Over 10,000 tests have since been made on various materials from different parts of France, Northern Africa and the African coast, the total expenditure (including rent and overhead) being less than Frs. 60,000 a yr. The article briefly gives the conclusions arrived at as a result of tests on cooking, equipment, practical applications, cooking liquors, various raw materials (leaves, flax from the seed, flax waste, hemp waste, jute waste, etc., peat, palms, typhas, esparto, osier, etc.), mixtures of pulps, electric insulators from pulp, waterproofing of chemical pulps, oils, fats and waxes, plastic pulps, cellulose, machines.—A. P.-C.

K-14. Damper for super-calendered stock. JOHN GOODEY. Paper, **27**, No. 8, 22, (Oct. 27, 1920). Brief description, with diagram, of a brush and doctor which may be used as a damper for super-calendered paper and which could be fitted on American winders after the sheet passes the slitters.—A. P.-C.

R-1. Papermaking in Finland. A. SOLITANDER, Consul General of Finland. Paper, **27**, No. 8, 9-11, 19. (Oct. 27, 1920). A brief review of the forest resources of Finland, the effects of the Russian demands on its production, the effects of the War on its markets and production, and the present status of the ind. as regards production, equipment and organization.—A. P.-C.

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News From Our Advertisers

A History: 1842-1920.

Far back in 1642 Paul de Chomedy and his associates founded the City of Montreal. De Chomedy chose the site of Montreal with the vision with which great men are gifted. He saw what many were blind to—the rich possibilities of a city set in such environs. Yet at the close of the eighteen century Montreal numbered but twelve hundred houses. The streets were narrow, in the old world custom; the houses wholly of stone and iron-shuttered as a precaution against fire. Street lamps were unknown. The inhabitants stayed indoors from dark to dawn or sallied forth at their peril. There was no such thing as a police force. Not even the then European equivalent of a police—a night watch—patrolled the streets. But in the opening of the nineteenth century Montreal began to lay the strong foundations of future greatness. She began to come into her own, long since foretold by De Chomedy. Men began to recognize the commercial possibilities of Montreal. Among them were Mr. John McArthur and Mr. Alexander Ramsay, who founded the firm which later became McArthur, Irwin, Limited.

Five years after their establishment fire all but wiped the City out of existence. No less than eleven hundred houses in the heart of the City were razed. About the same time the ship fever carried off six thousand immigrants quartered in sheds at Point St. Charles. This was a terrible set-back for so young a community. But the men who established McArthur, Irwin, Limited were dauntless. They came of that stern stock that never dreams of hesitancy once the shoulder is set to the wheel. Hard work was nothing. Reverses came but to be conquered. They dreamed and worked for a firm, built by their own and their sons hands, with every difficulty mastered, that would be second to none. Their ambitions were more than realized as events have shown. The first location of this sturdy young firm was at the corner of St. James and McGill Streets, where the Imperial Bank of Canada now stands. The McArthur building of 1842 had thick stone walls, solid iron shutters, small windows and was lit at night by oil.

Railways had been inaugurated in Canada but a few years previous. The first ran from Laprairie to St. Johns, P.Q., and another short line connected Montreal to Lachine, where stages were available for New York and other points. Then the Grand Trunk line was completed from Portland to Longueuil in 1854, and so jubilant was the population of both cities that the citizens of Montreal literally entertained Portland en masse, and the citizens of Portland did likewise by Montreal.

As Victoria Bridge was still a dream, it was necessary to cross the St. Lawrence to reach the railway in Longueuil. In winter this was somewhat a perilous undertaking, especially with ice half-formed or breaking up. It was customary then to make the crossing in Indian dugouts, and many were the hairbreadth escapes from death. The career of Mr. John McArthur, father of his firm, was in grave danger of being cut off on such an occasion, when the dugout in which he was crossing was caught between grinding ice and violently flung on the ice pans. In course of time, Mr. John McArthur's son, Mr. James C. McArthur, entered the firm. At the early age of eighteen years he became a partner with his brother-in-law, Mr. Milton Pennington, Mr. James C. McArthur was obliged to seek emancipation from the courts in order that he might legally become a partner. Later, C. C. Corneille was added to the firm and the name McArthur, Corneille was continued for a number of years.

From St. James and McGill Streets the firm now moved to Lemoine Street; from there, with larger quarters imperative, they went to St. Sulpice Street; again they moved to De Bresoles Street and finally to St. Paul Street at the foot of St. Lawrence Main Street; where they remained until St. Lawrence Main was opened up to the waterfront, when they moved to quarters which McArthur, Irwin, Limited now occupy, 20-30 St. Paul St. and 21 and 31 Commissioners St. This present location is one of the oldest and most interesting of Montreal's landmarks. It dates far back to the days of the firm's inception, when walls were feet thick and floors were made to defy time. The rafters supporting the ground floor are cedar trees, hewn flat on one side, and the bark left on the balance of the log. The building has been modernized, but the heavy, solid stone structure, the wide-throated chimneys and massive rafters, tell their story plainly. The St. Paul Street buildings are used as sales offices, sample rooms and general offices.

McArthur, Irwin Limited, the modern realization of Mr. John McArthur's plan, was incorporated in 1912. The officers of the Company are: President: Mr. George Y. Chown, Kingston, Ont.; Vice-President and Managing Director: Mr. John Irwin; Director and Secretary-Treasurer: Mr. F. A. Bengough, Director, Mr. R. H. Monk.

For over fifty years the firm has been recognized as leading distributors for chemicals, aniline dyes, colors, paints, varnishes, glues, waxes, tanners' supplies and laundry supplies. Prominent among the foreign agencies represented are: McArthur & Co., Liverpool, England, Tanners' Supplies; John Lucas & Son, Philadelphia, Pa., Imperial French Greens; Sandoz Chemical Works, Switzerland, Aniline Dyes. The aggressive forward policy of McArthur, Irwin, Limited, which has always had as its goal the manufacture of all staple articles of the paint industry, has resulted in the establishment of factories at Commissioners Street, Montreal, for the fabrication of the famous CROWN DIAMOND line of Liquid Paints and Varnishes, at Britannia Street, Montreal, for the production of Chemicals and Dry Colors for the paint, ink, textile and paper trades, and at Outremont for the corrosion of Pig Lead and the manufacture of CROWN DIAMOND Pure White Lead, dry and in oil.

Through the institution of these three factories the jealously guarded reputation of McArthur, Irwin, Limited's products which have been known throughout Canada for dependable quality for generations has been adequately protected. The plants are equipped with the most modern machinery and are said to be without equal in the Dominion of Canada for efficiency and scientific control.

The position of McArthur, Irwin Limited is considerably strengthened by the affiliated companies, in which it holds the controlling interests. These subsidiary companies are: Miller Extract Co., Millerton, N.B., the only manufacturers of Hemlock Extract in the Dominion; The Davies, Irwin Limited, refiners of oil and waxes; Parker, Irwin, Limited, manufacturers of

(Continued on page 28.)

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, Dec. 30.—The week has shown no change in the pulp and paper situation. Generally speaking the trade is rather quiet, with large stocks of paper in the hands of the jobbers. Business in some lines, however, notably book papers, is keeping up well and wrapping and tissue paper dealers have little to complain of in the volume of business they are doing. Speculation is still rife, of course, as to the likely trend of trade and prices during the coming year, and although the feeling concerning the future is optimistic there are those who contend that if unemployment continues and American competition is reduced by a rising exchange rate, together with other possible contingencies, the Canadian paper market is bound to be adversely affected during the new year. Canadian publishers have been gradually raising their advertising and subscription rates and are preparing for further increases to meet the high cost of paper and other material and it is a question as to how near the present rates are to the point where advertisers will go no further. Papers are carrying large volumes of advertising now and much of this has to do with price reduction sales in many lines of merchandising. As a Toronto publisher pointed out, all this has a marked effect on the mind and temper of the merchant and the readers of papers. They believe that the peak of prices has been reached, and that any change made now should be in the direction of lessened prices. In such an atmosphere the advertising man has to go to the merchant now and explain his case, and it may be that he will have to go to his readers on a similar mission. That is what the Canadian daily publishers are facing now. Can they get more revenue for the same volume of business, or will they have to depend on increased business, which means increased mechanical expense in handling it? A provincial publisher pointed out that the price of newsprint had been fixed for the first three months of the new year at $130 a ton. Assuming that this price would prevail for the year, it meant that the publishers would have to pay thirty-three and a third per cent more for their white paper for 1921 than they did for 1920, since the average price for this year has been $100 a ton. Added to this is an increase of 40 per cent in freight charges. He added that the freight means an average increase for Western Ontario publishers of $2.50 per ton, this over and above the thirty-three and a third per cent. As the cost of paper is 44 per cent of the whole cost of producing a newspaper, this is going to be a big item, he said. On January 1st there is an increase of postage rates of 300 per cent and practically every publisher will have to face a decided increase in labor charges for next year. Every publisher is paying more for labor during the last three months of 1920 than he did during the first three months and there is no reason to believe that the rate will be lower next year. There is also the possibility of having to reduce the working time from forty-eight to forty-four hours.

These conditions in the publishing business are mentioned as showing the possible effect they may have on the paper trade generally. A weakness in pulp and paper stocks on the stock exchange was noticeable during the past week or ten days and the opinion prevails that this was due to the belief that in the new year there will be a large falling off in the demand for newsprint. The impression prevails that the consumption of newsprint will be retarded because of the high price and this may diminish newspaper circulation. If the period of heavy advertising the newspapers have enjoyed for some months is about to cease, as some believe, this will also have an adverse influence on the consumption of paper. On the other hand it is stated by some that the liquidation of stocks of merchandise will be carried on after the new year to a degree probably never before experienced. Whether such liquidation is called for or whether the goods can be replaced at the same price, is not regarded as the issue at the moment. What dominates the situation is the fact that the public is looking for lower prices and is not inclined to buy at present prices. Consequently, whatever the cost, the merchant would have to liquidate his merchandise and to carry out this liquidation in the most effective manner, advertising on an extensive scale would be carried out and this would call for a large increase in the consumption of newsprint. It is believed that some such situation will be in evidence during January and February and may go on until liquidation has been completed.

In connection with the newsprint situation a good deal of comment has been occasioned by a despatch from New York telling of a meeting between Canadian newsprint producers and United States publishers on the subject of newsprint prices for 1921, in which the prices already charged by the manufacturers were criticised and the possibility of large imports from Scandinavia referred to. The despatch is characterized as nonsense by those who are familiar with the details of the meeting, at which the difficulty of getting newsprint was acknowledged by the United States publishers, while the unsatisfactory character of the European product and the preference for Canadian newsprint were commented upon. According to officials of the Canadian Export Paper Company there is no chance of Europe being able to supply the shortage of newsprint and the situation, as it is at present, is particularly strong from the producer's standpoint. This is indicated by the fact that the company has enquiries for 100,000 tons at the present time which they cannot consider. One organization declares that it will not experiment any more with European news print and it is understood that the company has recently renewed contracts with one of the large producers on this continent. It is stated that the quality of the Scandinavian news print would not in any case be better than it was before the war, and actually is of a much inferior grade to the Canadian product. To attempt to change over from the strong Canadian material which they have been using for the past several years, to the weaker and flabbier paper from abroad that is reported to be coming into the competitive market, would be a rather expensive experiment for the publishers. Canadian paper has

progressed in quality in the past five years and there has been no improvement in the foreign article according to paper experts. As to the new imports of paper. it is not believed that they are influencing the contract market for news print, although they appear to have effected a decline in the spot market, which was to have been expected, although it does not materially affect the situation as regards the Canadian product. It is believed in some circles that the prices of news print are now at their peak and that any changes the future may hold will be of a downward tendency.

PRICES BEGIN TO TUMBLE.—Rather sensational reduction is all lines of wrapping, kraft, toilet and tissue papers went into effect since the foregoing was put in type. Beginning on January 1st the following prices become effective, the quotations being for carload lots to jobbers:

White wrap 8½c. former price 10¾c; gray rag, 8½c. former price 10¾c; "B" manila, 9½c. former price 11c; No. 1 manila, 11½c, former price, 12½c; fibre, 10½c, former price 12c, kraft, both glazed and unglazed, has been reduced in carload lots to 11½c, former price 13c. On tissue papers there has been a decrease of 20 per cent. on bleached and 15 per cent. on all other grades. Toilet papers are down fifteen per cent; paper towels 16 per cent and paper napkins ten to fifteen cents per thousand. The knife has also been applied to paper bag prices and the discount increased by ten per cent. The following schedule of discounts now prevails in carload lots to jobbers; manila bags 35, 10, 10 and 5 per cent; plain, unglazed kraft bags, 50, 10 and 5 per cent. There is no change in S. O. S. white bags, which is the only line not affected.

A meeting of the manufacturers of book paper and the publishers of trade and class newspapers will be held in Toronto this week to discuss terms and prices for the coming year. The publishers contend that owing to the general trend of prices in other commodities there should be a lessening of present quotations for book paper. They set forth the claim that corresponding lines are sold very much cheaper across the border and in case an amicable arrangement cannot be reached it is understood that the publishers will apply to the Federal Parliament at the next session to have the present customs duty on book papers, imported from the United States, removed. The whole question will be gone into fully and the outcome is awaited with much interest.

BOARD PRICES DOWN. — Another reduction of twenty per cent has taken place in board prices. Straw and chip board are now selling at $80 as against the recent price of $108; vat lined $90 as against $120; filled board $116.50 as against $139.80; white vat-coated pulp-back $177; news-back $164.50. All pulp board is now quoted at $116 and folding at $131.

PULPWOOD.—The demand for pulpwood is quiet and mills across the line are not buying. A leading operator stated that there were several reasons for the present depression, among them being that owing to the high prices which prevailed and the scarcity during the first few months of the year, much more wood had been cut by the settlers and farmers in Ontario and Quebec than usual, while a large number of lumbermen had been turning their small logs into pulpwood which was a much more profitable proceeding than converting them into lumber at the present quotations. A number of concerns in the north have stopped buying pulpwood and offers of wood are coming daily from almost every quarter. There are at present no stable prices.

NEW YORK MARKETS.

New York, December 31—(Special Correspondence)—The most important development in the paper market during the final week of 1920 has been an improvement in inquiry for various grades of paper from a variety of consuming sources. Actual business has profited but little, if any, by the increased interest displayed by buyers, because those consumers asking for prices and offers have done so more with a view of getting a line on market conditions and values than with an intent to place orders just yet. At the same time, the expansion of inquiry has created a better undertone in the market, and has strengthened the belief of manufacturers and jobbers that demand for paper and board will broaden considerably soon after the turn of the year.

A great many mills have been closed down tight this week, which is but a common occurrence at this season, and paper manufacturers have devoted their major attention to compiling inventory and in making machinery repairs. Jobbers, too, are busy taking stock and putting their warehouses in shape for the new year, and one of the strong factors in the market is that offerings of paper of all kinds are of light volume. The average seller of paper is today pursuing a waiting policy, that is, waiting for customers to come to him for supplies. It is fully recognized that with buyers in their present frame of mind they can hardly be induced to absorb supplies unless in immediate need of fresh stock, and that if the need is pressing the buyer will not lose much time in looking for the paper.

On the eve of the new year it can be said that probably never before in a dull period such has as lately prevailed there has been an air of confidence regarding the outlook as pervades the paper trade at present.

If anyone is under the impression that paper manufacturers, mill agents or jobbers are pessimistic or dubious about the future, he only has to devote about five minutes of his time to talking to almost any member of the trade to learn that a feeling of calm optimism exists, with a majority of leading factors of the trade expressing the belief that the coming year will prove one of great activity and prosperity for the paper industry. Stocks of paper at consuming centres and in consuming plants are known to be light, and there is every confidence expressed that business in all lines will soon broaden, thus leading to an appreciable increase in paper consumption. The monthly report of the Federal Trade Commission on the paper industry for November, just issued, shows that production in that month was at a lower point than in any previous month this year, being no less than 150,000 net tons under the high water mark reached last July. This indicates that mills have decreased their output in proportion to the dropping off of demand, and would imply that stocks of paper at mills are not above normal, which should result in increased manufacturing activity as soon as the expected expansion of demand sets in.

There is no worthwhile change in prices to report. Practically all grades of paper are holding at about last noted levels, and every indication would seem to point to the market having touched bottom. Large



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users of paper, newspaper and periodical publishers and wholesale stationers in particular, are arranging contracts with mills for deliveries over the new year, and this constitutes the bulk of activity current. Spot buying is of routine scope only and has developed no fresh feature. Newsprint in rolls is bringing around 7 to 8 cents per pound in sales to the transient trade, and machine-finished book paper is selling in the open market for immediate delivery at 12 to 13 cents and on contract at 9½ to 10 cents. Boards are holding steady in price at $45 a ton at mills for chip and $50 for news board.

GROUND WOOD.—A decidedly firmer undertone is evident in the mechanical pulp market. Inquiry is reported to have speeded up, and representative dealers and importers say that some of their largest consumers are shopping about in an effort to learn what supplies of pulp are available and at what figures pulp can be bought. Prices have not advanced but they have tightened to a noticeable degree. Domestic ground wood of prime quality is held for at least $95 per ton at grinding mills and most sellers are asking $100, and sales reported at less than these prices involve only an odd carload or two which producers are anxious to move quickly. Foreign ground wood has sold at better than $85 a ton ex the dock at this port, and it is understood that most importers are demanding $90 for future deliveries of sizable tonnage. The entire complexion of the market is stronger, and it would appear that the predicted turn in the situation had about commenced.

CHEMICAL PULP.—Chemical wood pulp, too, is in a firmer market position. There is an undercurrent of demand which, while it has not developed into actual business, shows that papermakers are beginning to look after future requirements, and the increased interest evinced by buyers has prompted sellers to adopt different tactics and to hold firm for full quoted prices in practically every instance. Kraft pulp has strengthened in tone to a marked extent. Where offerings of this kind of pulp a short time ago were made at sharp concessions, today sellers are holding for at least $100 per ton on domestic kraft, with some producers reported having turned down bids of $110 on future commitments. Numerous contracts are being arranged covering deliveries of news grade sulphite over 1921 at $115 to $125 a ton at pulp mills, and importers who were recently inclined to sell foreign bleached sulphite at 9.50 cents a pound and less are now demanding 10 cents and higher, claiming that they can scarcely import No. 1 sulphite to sell at 10 cents at a profit for themselves.

Imports of pulp at the port of New York this week included 11,157 bales from Newcastle; 1,155 bales from Hamburg, and 2,175 bales from Rotterdam.

RAGS.—Although business in papermaking rags continues dull, there is an improved tone to the market due to the fact that consumers are displaying more interest. Dealers say that they could readily transact quite a large trade in rags for future delivery were they willing to book orders at prevailing prices, but few will sell stock on today's basis except for immediate shipment, it being their contention that if they must hold rags they prefer to hold them on their own account so as to be able to take advantage of any rise in the market that may occur after the first of the new year. Everyone in the packing trade is of the opinion that prices will advance as soon as demand from paper mills exerts itself, it being claimed that stocks are not above usual volume, that present collections throughout the country are light and that very few sizable amounts of rags are now being imported. Prices are holding at fairly steady levels. No. 1 white shirt cuttings are quoted to mills at 20 cents a pound f.o.b. shipping points, washables at 7.50 to 8 cents, fancy shirt cuttings at 10.50 to 11 cents, new unbleached muslins at 16.50 to 17 cents, old No. 1 repacked whites at 9 to 10 cents, repacked thirds and blues at 3 to 3.25 cents and roofing rags at a cent per pound for No. 1 packing.

Imports of rags at New York this week included 2,386 bales from Antwerp, 342 bales from Havre, and 564 bales from Belfast.

PAPER STOCK.—Aside from a further downtrend in prices on shavings there has been little change in the paper stock market. Demand continues narrow and apparently only the fact that values have sunk to levels where they are close to the cost of production are prices on low grades maintained. Prices have eased off to 5.50 cents per pound on No. 1 hard white and 4.50 on No. 1 soft white shavings, and purchases could probably be engineered in some quarters at still lower figures. Folded newspapers rule quotably steady at 60 to 65 cents per 100 pounds at shipping points, and No. 1 mixed papers are available at 35 to 40 cents. Old kraft paper is quoted at 3 cents a pound, white news cuttings at 3.25 to 3.50 cents, and No. 1 books and magazines at 1.40 to 1.60 cents.

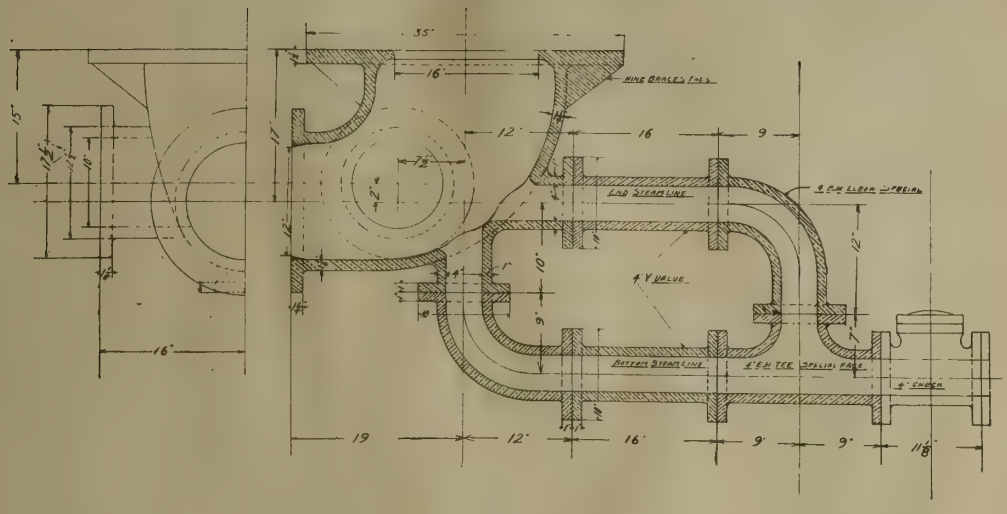
OLD ROPE AND BAGGING.—The market is nearly devoid of orders for old rope and bagging and there is very little trading in these commodities. Quotations are easy and it is a question just how low buyers can obtain supplies.

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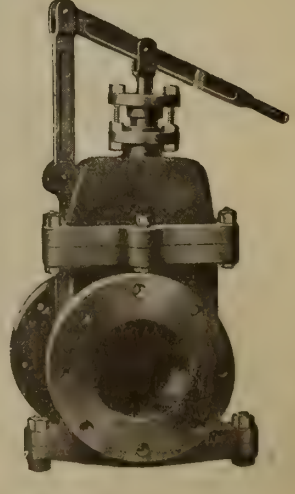
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NEWS FROM OUR ADVERTISERS.

(Continued from page 22.)

leather dressings, polishes and shoe findings. The latest addition to the list is the Laporte, Irwin Limited, recently formed to manufacture peroxide of hydrogen and blanc fixe for the Canadian markets. The Vice-President and Managing Director, Mr. John Irwin, has entire charge of the business. Indeed, it is largely due to his untiring energy that the firm has prospered so well since incorporation in 1912. Mr. Irwin is a Canadian born at Kingston, Ont., and like his predecessors in the business he is zealous in his country's interests. The motto of the firm is "Expansion through co-operation," and never was a motto more faithfully lived up to or a firm more loyal and welded than McArthur, Irwin Limited is to-day.

U. S. WOOD PULP PRODUCTION FOR NOVEMBER.

The following is a tabulation of the production, producing it, and stocks of finished pulp, in tons of 2,000 pounds on an air-dry basis, for November 1920.

	Number of mills.	On hand first of month.	Production for month.	On hand end of month.
Ground Wood Pulp	161	94,150	139,535	108,529
Sulphite, News Grade	63	17,139	70,888	17,043
Sulphite, Bleached	32	4,448	49,932	4,381
Sulphite, Easy Bleaching	6	761	4,821	1,192
Sulphite Mitscherlich	7	1,142	6,930	1,627
Sulphate Pulp	21	4,758	16,518	7,075
Soda Pulp	28	5,826	37,076	6,938
Other than Wood Pulp	4	238	341	192
Total for All Grades	—	128,462	326,041	146,968

Total stocks of all grades of pulp in the mills on November 30 amounted to 146,968 tons. Mill stocks of news grades sulphite, bleached sulphite and other than wood pulp decreased during the month. All other grades increased.

Ratio of Stocks to Average Production.

Comparing the stocks on hand at the domestic pulp mills at the end of the month with their average daily production based on the reports covering the years 1917, 1918, and 1919, the figures show that ground wood pulp wood stocks equal slightly less than 24 days' average output; new grades sulphite mill stocks equal slightly more than 7 days' average output; bleached sulphite mill stocks equal slightly less than 3 days' average output; easy bleaching sulphite mill stocks equal slightly less than 5 days' average output; Mitcherlich sulphite mill stocks equal slightly more than 6 days' average output; sulphate mill stocks equal slightly less than 15 days' average output; soda pulp mill stocks equal slightly less than 6 days' average output; mill stocks of "other than wood pulp" equal about 5 days' average output; total mill stocks of all grades equal slightly less than 14 days' average output.

Loss of Production

The idle machine time of grinders and digesters reported to the Commission for the month of November, 1920, is shown in detail in the attached tabulation. The lost time is compiled from the following operating reports: Ground Wood Pulp, 96 companies operating 132 mills and 921 machines; News Grade Sulphite, 44 companies operating 56 mills and 172 machines; Bleached Sulphite, 23 companies operating 25 mills and 110 machines; Easy Bleaching Sulphite, 6 companies operating 6 mills and 22 machines; Mitscherlich Sulphite, 7 companies operating 7 mills and 46 machines; Sulphate Pulp, 17 companies operating 17 mills and 64 machines; Soda Pulp, 21 companies operating 27 mills and 181 machines; Other Grades, 2 companies operating 2 mills and 4 machines. The reasons tabulated for lost time are lack of labor and repairs. "Other Reasons" include lack of wood, lack of water power, etc. The time lost in November, 1919, is shown by grades and reasons for purpose of comparison. These figures do not include 8 mills which were not in operation.—Federal Trade Commission.

IMPORTANCE OF WOODS END RECOGNIZED.

The importance of the woods end of the paper industry was emphasized by the organization of the Woodlands Section of the American Paper and Pulp Association, at the Fall Business Conference of this Association at Chicago.

Membership in the Section is open to Woods Superintendents, Logging Engineers, Foresters and others directly employed by pulp and paper manufacturers in the acquisition, exchange, management and exploitation of timber or timberlands; and to forestry students and others interested in the woods end of the paper industry.

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PROTECTING POPLAR TREES FROM BORERS.

Experts of the United States Department of Agriculture claim that they have found a means of controlling, if not entirely eliminating, the aspen borer. This is the gray-green beetle which often destroys whole plantations of trees that are so essential to the soda pulp industry. The fast growing poplars and aspen trees have been particularly subject to the attacks of this insect pest. In some areas where poplar and aspen predominate, the standing dead, fallen and dying trees exceed 50 per cent. of the total stand. Two methods of controlling the insect have been devised as the result of experiments conducted by department experts in various localities. The first of these consists in destroying the insect by cutting the brood trees. Brood trees are individual trees attacked several years in succession and are readily identified by the scarred trunks and deformed branches. These are the breeding points of the borer, and a man with an axe can cut and pile fifty such trees in a day. The trees are piled and burned or split open so that the wood is exposed to the sun. The other method, not practical in the forest, but applicable to shade trees, is the application of creosote or carbolineum to the egg scars. This should be done in October after the adults have deposited their eggs.

The top of the driving pulley should run towards the driven pulley, not away from it. This means that the pull will be from the bottom and the slack side above. If the greatest tension is from the top the arc of contact is lowered and a great deal of power wasted.

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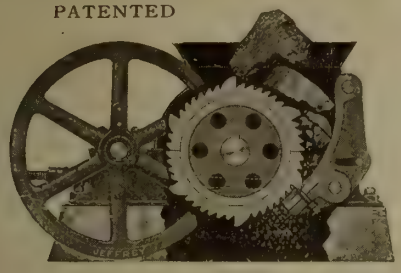
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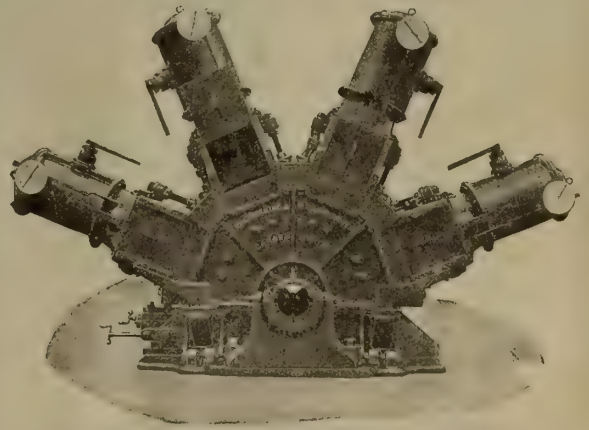
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VOL. XVIX. GARDENVALE, P. Que., January 13th, 1921. No. 2

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal,
'Phone Uptown 7773.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

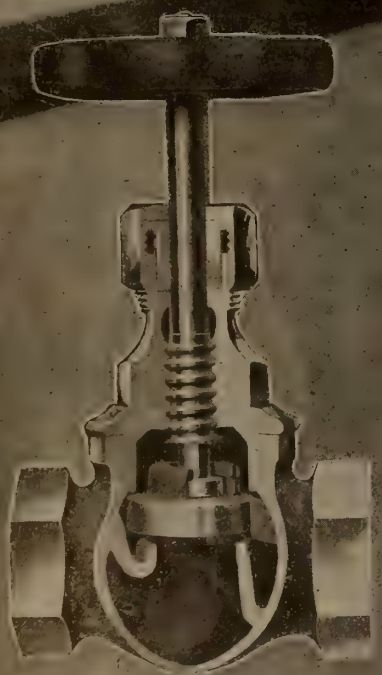
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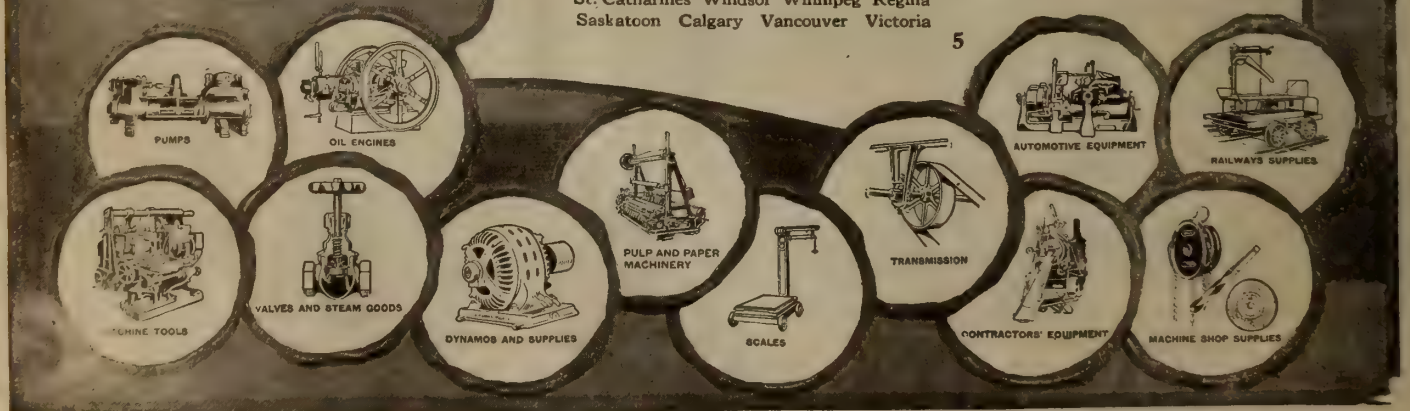
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-:- EDITORIAL -:-

BEGINNING AT THE BEGINNING.

The lesson that the pulp and paper industry seems to find the greatest difficulty in learning is that efficiency should begin at the beginning. The beginning of this industry is the forest, which apparently is just coming to be properly realized. The reason probably lies in the large excess of available timber over current requirements and the condition of relatively recent days when the forest had to be cleared to make room for farms and towns. There has come a great change since those days, and concerns that once left on the ground many saw logs with only slight defects are now glad to get a good bite for the saw. Localities that once were prosperous saw mill towns are now deserted hamlets. Some pulp mills would follow their sad example except for the greater sacrifice or expense of moving the more costly equipment. The forest frontier has receded till the transportation of raw material has become so expensive a matter as to render some mills almost unprofitable.

These things could have been foreseen and provided for, but they were not. The good ship has struck a rock. The problem now is to repair the damage and henceforth to sail in a safer channel.

Our methods of paper making and pulp manufacture came originally from Europe and many of our machines likewise. Why not make equally good use of what Europe has learned respecting the handling of the forest, the back-bone of our whole industry. Encouraging signs are to be seen and Canada is blazing the way. Our mills are beginning to realize that the great success of the chemical men and scientific management in the mills in perfecting processes and improving equipment is like building a house on the sands unless there be a sure supply of raw material for the mill. That is why the Forest Protective Associations, Society of Forest Engineers, Woodlands Section, etc. have been established.

It is significant that the Canadian Pulp and Paper Association, along with others dependent on the forest have been in the forefront of real conservation measures and movements. No country's prosperity more immediately hangs on the condition of her natural resources, than Canada's, and no industry is more concerned than the manufacturers of pulp and paper. The forest must be preserved.

These organizations for the preservation of the forest meet at the Windsor Hotel, Montreal, next Wednesday and Thursday, Jan. 19 & 20. The Imperial Forestry Conference in England, last summer, emphasized the importance of Canada's forests and forest industries in the markets of the world. Those who have any interest in their perpetuation and success should attend these meetings. A mill cannot operate at all without raw material and cannot operate profitably without cheap raw material. We are now headed for a condition where, before long, wood at our mills will cost as much as finished pulp in Russia or Scandinavia.

A donkey will pull his load in a vain effort to reach the bundle of hay held just out of his reach. Our industry has a responsibility to discharge, a burden to carry for the world. Let us keep the fodder for our mills within reach. That is what the Woodlands Section is for and that is why every member should be at the meetings next week.

THE CIVILISING EFFECT OF WORK.

We had the pleasure of hearing the other day, an interesting talk on the subject of Neo-Paganism. This was defined as the paganism of the present day and the speaker showed that there is a distinct tendency for many of the characteristics of pagan times to reappear in modern life. One of the most striking is the disinclination to work. A feature of ancient days was the prevalence of slavery. In eastern countries the slaves were chiefly from conquered nations. Among the Indians the slaves were the women. The reason for slavery was the idea that work is degrading. One of the principal effects of Christ's life was that He made work dignified and honorable. He worked, the apostles worked, the early disciples worked, and the Scriptures contain numerous references to the dignity of, and the necessity for work. People are naturally lazy but they cannot perform the function for which they came into the world nor discharge their obligations to their Maker without working.

One of the disturbing signs of the present time is the growing dislike for, and disinclination to work. Mention was made of a case where the delivery of an order was greatly delayed and an explanation was given by describing a singular but somewhat typical but perhaps unusual incident which was said to have occurred in a big manufacturing plant. A piece of metal was to be turned on a lathe, the operator started to pick it up when he was told that he must not do that as there was a helper for such work. The helper refused to lift it because it was considered a laborer's work and finally the piece was put in place after the

loss of an hour and a half. It does appear to be serious when distaste for work is combined with organised discouragement of those who are willing to exert themselves.

Surely there is nothing more honorable, more helpful, or more rich in satisfaction than work. Success depends on it, happiness depends on it, and even the stability and life of each nation depend on willingness to work and the effectiveness of the work of everyone who is able to do so. The continuation of a condition where the tendency is continually to shorten hours and to do less work in those hours, or as the speaker referred to put it, to begin the day when the whistle blows to quit, is to invite economic disaster. The world is done with slavery and the best way to prevent its recurrence is for each to do his share of work.

COBWEBS.

The editor appreciates the penknife and good wishes of Canadian Fairbanks-Morse, Ltd. It is much more convenient that the pocket tool-chest we have heretofore had to carry.

The Pulp and Paper Magazine is honored by having quoted in the 1921 Diary of Gottesman & Co., a short history of sulphite pulp manufacture from the article by H. G. Spear, in our International Number, 1920. Brief descriptions of several pulp making processes are taken from the Handbook issued by the Canadian Pulp & Paper Association.

A friend who is a grammatical and etymological specialist says we made a mistake last week in the use of the word "consistency" as applied to paper stock, as that word is an abstract from referring to an attitude of mind. It is, apparently, often misused, therefore, in the paper and pulp mill, where consistence, density or concentration would be correct.

An Irishman once said, "Ye can't believe half of what ye see in the newspapers and the rest is a damn lie." That seems to be the case with the note in our issue of December 30, regarding the Kingston Whig and the E. B. Eddy Co. The latter informs us that "the Appelate Division at Osgoode Hall dismissed the Kingston Whig's appeal as well as the cross appeal with costs."

The Chemistry of Pulp and Paper Making is the title of a book by Edwin Sutermeister, one of the first copies of which has just been received by the Editor. We have followed its preparation with great interest and hope that it has the large sale it deserves. A review will be published in an early issue.

It was unfortunately necessary to postpone printing the interesting account of the Meeting of the Association of Paper Mill Superintendents which were held last Saturday.

THE CARELESS SMOKER.

(With Apologies to Kipling).

Note.—The American Forestry Association calls attention to the fact that the forest fires in this country burn ten times the area of devastated France every year.

A fool there was and his pipe he lit
(Even as you and I),
On a forest trail where the leaves were fit
To become a blaze from the smallest bit
Of spark—and the fool, he furnished it
(Even as you and I).

The forest was burned to its very roots,
Even beneath the ground,
With the flowers, the birds and the poor dumb brutes.
Old hoary oaks, and the tender shoots
Which might have made logs but for such galoots,
Allowed to wander round.

The lumberjack has now passed on,
His pay-day comes no more,
And the screech-owls haunt the camp at dawn
Where the cook's tin pan woke the men of brawn;
But the mill is silent, the trees are gone,
From the soil and forest floor.

A deadly sight are those hills of rocks
Which once were beds of green;
No hope for the human, no food for the flocks;
The floods must be held by expensive locks,
While the harbor is silted to the docks—
The ships no more are seen.

But the fool smokes on in the forest still.
Leaves camp-fires burning too,
While the patient public pays the bill
And the nation's wealth is destroyed for nil.
If the law doesn't get him, the devil will—
Smoker, it's up to you!

—*The Pathfinder.*

Editor's Note: The man who wrote this poem does not owe any apology to anyone. We only wish that a few of the fools who are killing our forest industries might take it to heart.

PULP PRICES DROP A BIT.

Toronto.—The demand for pulp of all kinds is rather quiet at the present time as consumers do not care to load up with large stocks in view of the uncertain and downward trend in the price of all lines of paper. Groundwood is quite plentiful and is commanding from $70 to $95 at the mill, according to grade, shipping facilities, freight rates, etc. Strong, natural sulphite is selling at from $133 to $140 and bleached sulphite at $160 to $165 at the mill, with news grade as low as $95 and $100. Sulphate pulp is quoted at $125. The mills, it is understood, have quite a stock on hand of all kinds of pulp and are proceeding conservatively. It is though that war prices are gone for good and as manufacturing costs are bound to come down, pulp prices will not touch the exalted figure which they commanded during the first few months of the past year.

Moving Pictures showing river driving scenes on the St. Maurice River, taken by the Laurentide Pulp and Paper Co., and lent for the occasion, provided the entertainment for the members of the Engineering Institute, Montreal Branch, on Thursday, Jan. 6th.

Canada's Pulp and Paper Industry in 1920

By A. L. DAWE, Secretary, and EDWARD BECK, of the Pulp and Paper Association of Canada.

(Compiled from Annual Review Numbers of the Montreal Gazette and Toronto Globe.)

The year 1920 has been notable in the annals of the pulp and paper industry of Canada for the number of new enterprises planned or actually begun, and whose completion is destined to emphasize still more the value of this industry to the industrial and commercial life of Canada. The year has also been marked by the expansion of a number of the old-fashioned companies and by a very general capital reorganization made necessary by such expansion.

All the mills were employed at top capacity for the first ten months of the year, although some slackening has since taken place in come lines owing to a slight decrease in orders due to hesitancy on the part of buyers to purchase in what they believe to be a declining market. The general breakdown in exchange has hampered exports to some extent. Low water conditions during the final quarter of the year also served to restrict production.

The cost of raw materials has ruled abnormally high throughout the year, while wages have also risen to a new high level. Since most of the raw materials entering into the manufacture of pulp and paper are, of necessity, bought many months in advance of their consumption, immediately liquidation in the price of the finished product is not altogether feasible.

Export demand for the higher grades of pulp and for newsprint paper has exceeded the supply throughout the year, and, despite the exchange difficulties already alluded to, exports of these commodities have greatly exceeded, both in value and volume, those of any previous year.

A Period of Readjustment.

The period of industrial readjustment through which Canada, in common with most countries, is passing finds the pulp and paper industry confronted with the usual number of difficulties but determined to meet and overcome them. Deflation of market price, now common in many lines, has not as yet materially affected commodities dependent upon this basic industry, the chief reason being that the principal raw materials entering into the manufacture of pulp and paper products have to be obtained many months in advance of their actual use in manufacturing. Pulpwood is cut, driven and stored from one to two years before it actually reaches the grinders, coal is bought a year in advance, and the other materials employed in producing paper also have to be provided months beforehand. Pulp and paper now in process of manufacture are the result, for the most part, of purchases of raw materials made at peak prices and little reduction in selling price can be anticipated until this high cost material is used up. Labor also, so far, shows little indication of receding in cost, although woodsmen are more plentiful and less exacting in their demands.

Demand Begins to Slacken.

The abnormal demand for paper, especially of newsprint and book, which contributed greatly to the well-being of the industry during the past two years is undoubtedly beginning to decline. This will naturally affect conditions in the future.

The breakdown in international exchange is also having an adverse effect on foreign selling of Canadian pulp and paper in more ways than one. Some countries, such as Australia, are now without bank credits in Canada and the difficulty of doing business with them is enormously increased, even though they may still be anxious to obtain Canadian products. The exceedingly high value of American funds as compared with most European currencies has given the paper-manufacturers in Germany, Sweden, Norway and Finland a marked advantage in the American market, even when the difference between Canadian and United States exchange is taken into account.

Notwithstanding those obstacles, however, Canadian papermakers are, for the most part, still operating their plants at full capacity and finding a market for their output. Expansion of the industry, which was seriously retarded during the war years, is going forward at a rate which must within a short time establish Canada still more firmly as one of the world's principal paper-producing countries.

Exports of pulp and paper for the first eleven months of the calendar year—January to November inclusive—reached a total value of $148,515,899, compared with $87,370,262 during the same months last year. They were made up as follows:—

1920.	Paper.	Chem. pulp.	Mech. pulp.	Total.
January	$5,519,718	$ 2,658,974	$ 972,574	$ 9,151,268
February	6,304,388	2,615,156	474,383	9,391,927
March	7,231,207	3,875,281	562,308	11,668,796
April	4,729,354	2,936,683	506,369	8,172,356
May	6,939,346	4,318,972	779,710	12,038,028
June	7,877,740	6,254,409	2,136,767	16,268.916
July	6,877,014	6,608,740	2,528,993	16,014,747
August	6,746,817	6,702,644	2,809,266	18,258,727
September	7,855,493	6,758,156	1,877,053	16,490,702
October	8,128,254	6,590,944	1,986,807	16,706,005
November	7,897,465	5,440,780	1,016,184	14,354,429
Total	$78,106,796	54,760,689	$15,648,414	$148,515,899

U. S. Best Customer.

The United States continues to be Canada's best customer. During the first seven months of the current fiscal year, Canada's paper exports were distributed as follows: United States, $40,067,276; United Kingdom, $2,811,561; Other countries, $8,275,181. Woodpulp exports—United States, $43,281,562; United Kingdom, $6,193,991; Other countries. $3,319,910.

Despite much agitation in favor of conserving Canada's raw materials and converting them into finished products in this country, a large amount of unmanufactured pulpwood is still leaving the Dominion. In the seven months' period above referred to Canada exported 778,246 cords of wood, valued at $9,556,255, to the United States.

Over $300,000,000 Invested.

Statistics of the industry now indicate a capital investment of well over $300,000,000 and an annual output exceeding $225,000,000 in value. The consumption of pulpwood this year is estimated at 3,500,000 cords, exclusive of over 1,000,000 cords exported to the United States. Large increases are shown in the volume of sulphite, sulphate and groundwood pulp produced. Paper and paper products, particularly newsprint, also show a gratifying increase, held back, to a slight extent, by unfavorable water conditions at some of the mills during October and November.

Company Reorganizations and Incorporations.

Expansion of the industry has brought about the formation of a number of new companies, as well as the reorganization of the older ones.

The Abitibi Power & Paper Company, Limited, recalled its $5,000,000 share capital, issued on the basis of $100 par value, and re-issued it in the form of 250,000 shares of no par value, or five new shares for each one of the original issue.

The Laurentide Company, Limited, increased its outstanding share capital from $9,600,000 to $28,800,000, retaining the par value of $100 a share and giving to each shareholder three shares of new stock for each share of the old.

Price, Bros. & Company, Limited, declared a stock dividend of 22% early in the year, increasing their capital by this means from $5,000,000 to $8,540,000. The company has also gone through a process of reorganization under which shareholders in the original company are entitled to receive five shares in the reorganized company for each share of the old, the par value of the shares remaining at $100 each.

The Brompton Pulp & Paper Company, Limited, reissued its $7,000,000 outstanding capital on the basis of two shares for one of no par value and placed the new shares on a 7% dividend basis. The company has also been authorized by its shareholders to issue an additional 70,000 shares of new stock at its pleasure.

The Provincial Paper Mills, Limited, was reorganized to take over the Provincial Paper Mills, Limited, and the Port Arthur Paper Company, its outstanding capital being increased to $3,500,000 common shares, and $1,700,000 preferred, on the basis of three shares of new stock for one of old.

The Howard Smith Paper Mills, Limited, reissued its old outstanding common stock of $1,062,500 on the basis of two for one and bought it up to $2,500,000 par value.

The Wayagamack Pulp & Paper Company, Limited, increased its outstanding 50,000 shares each of $100 par value to 250,000 shares of no par value, giving to each shareholder two shares of new for one share of old, and offered 50,000 shares ratably to shareholders, retaining 100,000 additional shares in the treasury for possible future needs.

The Dryden Pulp & Paper Company, of Dryden, Ont., was taken over by the Dryden Paper Company, Limited, the new company being capitalized by an issue of $405,000 10-year 6% bonds, $1,100,000 30-year 6% debentures and 100,000 shares of common stock of no par value, issued at a nominal price of $35 a share.

One of the most important developments of the year was the official announcement that the International Paper Company of New York, whose new pulp and paper mills at Three Rivers, Que., are now well on the way to completion, will shortly begin the erection of a second pulp and paper plant in Canada, presumably in New Brunswick, where the company already owns extensive timber leases and important power rights.

Price Brothers & Company's projected development of a large paper mill and a new industrial community a few miles east of Chicoutimi, on the Saguenay river, to be known as "Saguenay," plans for which were definitely announced last fall, has been retarded by the inability to get deliveries of paper mill machinery from Great Britain. The preliminary plans have all been perfected, however, and, it is understood, construction work will begin in due time. The completion of this undertaking will place this company in the ranks of the world's largest paper producers, giving it a daily output of about 800 tons of newsprint paper alone in addition to numerous other products.

The Three Rivers Pulp & Paper Company, Limited, was incorporated under the Dominion Companies Act and capitalized at $4,000,000. This company, whose head office is in Montreal, is now building a 100-ton pulp mill at Three Rivers, Que., which is expected to be in operation in November, 1921.

The Manouan Pulp & Paper Company, Limited, organized with a Dominion charter, has an authorized capital of $7,500,000, of which $6,900,000 has been issued. This company is building a 100-ton groundwood pulp mill on the St. Maurice river at Weymontechegne, above La Tuque, Que., which is expected to come into operation in April next.

The St. Regis Paper Company, Limited, of Canada, a subsidiary company of the St. Regis Paper Company of America, has been organized. It is owned and operated by the same interests as the parent company and is capitalized at $1,600,000. Of the total capitalization, $1,500,000 is in preferred stock, of which $1,000,000 is to be used for additional working capital and there will be $100,000 in common stock without par value, All the stock is to be owned by the St. Regis Paper Company of America. The company starts business with $1,600,000 paid in. The business of this company will be to furnish Canadian pulpwood from its freehold lands to the American company and its mills at Deferiet, Herrings and Black River. An extensive operation is now under way in the Champlain and St. Maurice districts in the province of Quebec, and a much larger operation will be started in the Saguenay districts.

Expansions and Improvements.

General expansions and improvements now under way are summarized by provinces as follows:—

Ontario.

Cornwall.—Howard Smith Paper Mills, Limited, increasing their bleached sulphite pulp output to 50 tons daily.

Port Arthur.—Port Arthur Pulp & Paper Company, Limited, taken over by the Provincial Paper Mills, Limited, of Toronto, extensions and improvements under way, including the addition of a 40-ton paper mill.

Port Arthur.—Kaministiquia Pulp & Paper Company, Limited, acquires timber limits and mill site for the erection of a new pulp mill, announced to have 250 tons daily capacity.

Fort William.—Fort William Pulp & Paper Company, Limited, erecting a new $3,000,000 pulp and paper mill on the mission property at the mouth of the Mission River, Fort William, to produce 120 tons of groundwood pulp and 100 tons of newsprint daily. Pulp mill now nearing completion.

Nipigon.—Nipigon Fibre and Paper Mills, Limited, erecting 40-ton pulp mill.

Kenora.—Lake of the Woods Pulp & Paper Company granted certain power concessions upon undertaking to erect a pulp and paper mill.

Frankford.—Canadian Paper Board Company erecting new pulp mill of 25-ton daily capacity and to follow with a 60-ton board mill.

Kapuskasing.—Kimberly-Clark Co., of Neenah, Wis., take over the Spruce Falls Pulp & Paper Company and commence building groundwood and sulphite plants, each with a 75-ton daily capacity, to be followed with a three-machine newsprint mill of 150-ton capacity.

Thorold.—Interlake Tissue Mills, Limited, erects a new addition for the manufacture of tissue papers.

Cornwall.—Niagara Wall Board Company of Buffalo, N.Y., takes over the Ross & Co., mill to manufacture wall board and heavy paper specialties.

Dryden.—Dryden Pulp & Paper Company, Limited, enlarging its plant from a total daily production of 70 tons of sulphate pulp and kraft paper to 170 tons.

Sturgeon Falls.—Spanish River Pulp & Paper Mills, Limited, installing new paper machine of 55 tons daily capacity, bringing their total output to 650 tons daily.

Strathcona.—Strathcona Paper Company installs new building paper machines and otherwise adds to its equipment.

Thorold.—Ontario Paper Company, Limited, installing new 50-ton newsprint machine.

Iroquois Falls.—Abitibi Power & Paper Company installing three new newsprint machines of 230 tons daily capacity, increasing their daily output to 460 tons.

Quebec.

Chandler.—Saguenay Pulp & Paper Company's mill increased output from 80 to 130 tons a day.

Grand'Mere.—Laurentide Company, Limited, installs two new newsprint machines with a daily capacity of 150 tons, giving a total daily output of about 350 tons of newsprint and 60 tons of board. Company has also acquired extensive additional pulpwood limits.

Quebec.—Hammermill Paper Company of Erie, Pa., buys the Matane Lumber & Development Railway, with timber lands, mill site, river improvements, etc., for the purpose of erecting pulp and paper mills.

Clarke City.—Gulf Pulp & Paper Company taken over by the Imperial Paper Mills of London, Eng., in association with the Amalgamated Press, Limited, and plans announced for increasing its output.

Crabtree.—Howard Smith Paper Mills, Limited, adding a new paper machine which will increase their output of high-grade writing paper from their two mills to 100 tons daily.

Kenogami.—Price Bros. & Co., Limited, adding a new 50-ton newsprint machine, increasing their newsprint output to 300 tons daily.

Three Rivers.—International Paper Company mills now under construction to produce 200 tons of pulp and 200 tons of paper daily.

East Angus.—Brompton Pulp & Paper Company, Limited, now constructing a new groundwood mill of 100 tons daily capacity. This company has recently acquired an additional tract of land comprising 90,000 acres and estimated to contain 1,100,000 cords of pulpwood.

Shawinigan Falls.—Belgo-Canadian Pulp & Paper Company, Limited, building new groundwood mill of 40-ton daily capacity and making other extensive additions to its plant.

Three Rivers.—Wayagamack Pulp & Paper Company, Limited, installing four new kraft paper machines, capable of producing about 12 tons a day each, bringing its total kraft production up to 100 to 115 tons a day. This company recently added 2,000 square miles to its timber limits.

New Brunswick.

Glen Falls.—Former automobile factory taken over by Clarke Bros.' Paper Mills, Limited, to be converted into a paper box and fibre shipping case manufactory.

St. George.—St. George Pulp & Paper Company taken over by the New York World Publishing Company of New York. Plans announced for increasing output of groundwood pulp from 20 to 100 tons daily.

Andover.—Fraser Companies, Limited, announce plans for construction of new pulp and paper mills at Tobique Narrows, near this place.

Nova Scotia.

Wolfville.—New pulp mill in course of erection for the Gaspereau River Light, Heat & Power Company, to make 8 to 10 tons of dry groundwood pulp daily.

Bear River.—Clarke Bros., Limited, extending their pulp mill from a 30 to a 50-ton daily capacity.

British Columbia.

Beaver Cove (Vancouver Island). — Beaver Cove Lumber and Pulp Company, Limited, extending its plant so as to increase its output of sulphate pulp from 30 to 60 tons a day; planning to add a paper mill plant capable of producing 200 tons of newsprint and 100 tons of kraft paper.

Prince George.—Eastern Canadian and American capitalists announce plans for a $6,000,000 plant to produce various grades of paper.

HEAD OF DOMINION PAPER CO., DEAD.

Mr. Frank Paterson Currie, died in Montreal last Thursday at the age of 81, following a long illness from heart trouble. Mr. Currie came to Canada from Lanarkshire, Scotland, in 1862, and since that time has resided in Montreal. He was president of the Dominion Paper Company, Limited, and of the W. and F. P. Currie Company, Limited. Apart from business pursuits, Mr. Currie was a life governor of the Montreal General Hospital, and of the Protestant Hospital for the Insane. He was a member of the Board of Trade and of St. Andrew's Society. He is survived by his widow, one son, T. S. Currie, and four daughters.

News From Europe

THE RE-MANUFACTURE OF WASTE PAPERS.

(Pappen- und Holzstoff-Zeitung, Nov. 25 and Dec, 2, 1920.)

Although in most cases old papers are delivered already sorted by the wholesalers and sorting establishments, it is advisable—particularly in the case of printed paper—to carry out a second sorting, in order to remove possible admixtures of coloring matters. In the case of papers with printing and writing on them, it is often necessary to subject the material to dusting in patented machines. This is especially true of old business papers, deeds, ledgers, etc., since these, as experience shows, collect and hold large quantities of fine dust.

The machines consist principally of a long conveyer which feeds the stock into a cutter where it is defibered and finely divided. It is then transferred to a duster or a fan where the dust and the heavy and fine particles are eliminated. The long conveyer which introduces the paper into the cutter enables workmen, who stand on both sides of the delivery railway, to sort out by hand colored papers, impurities, shavings, sawdust, plaster, glass, board, etc.

In most respects the cutter works like the rag-cutter, but it has some new features. It unwinds by a peculiar whirling motion, untwisting fibres, yarns, threads, rolls and bagging, removing dirt and impurities and tearing the strands apart. Behind the fan a platform is provided with a hood or cover; and means, preferably magnets, for attracting iron shavings, filings, nails, hooks, etc. Between the platform and the exhauster integral with it, a free space or compartment is formed in which the coarser and heavier impurities fall to the bottom. This exhauster sucks up the paper shavings and transfers them to the pulping room. But since the elevator of the exhauster has not sufficient power to suck up the heavier impurities that are not collected by the conveyer or eliminated by the fan, these heavy particles must fall to the bottom of the free middle compartment. But the lighter and finer impurities, like dust and sand, are removed in the duster.

Essentially simpler, but intended only for sorting and dusting, is the patented sorting machine (Ger. pat. 230,021). It consists chiefly of a perforated metal sheeting (screen), which hangs through an adjustable space in the traverse direction of the machine. The breadth of the sheeting amounts to 1-2 meters; its length to 4-10 meters and more. Underneath this metal sheeting a dust collecting chamber is provided. This sheeting is actuated with a shaking motion by means of the oscillator rods of two eccentrics geared into a common steel shaft. Owing to the oblique position of the screen, the oscillating movement causes the stock upon it to shoot upwards and forwards. Women, standing on both sides of the metal sheeting, remove the impurities, colored admixtures, etc., as the paper is tumbled out on the side by the jig-like motion. Sand and dust drop into the chamber underneath, from which they are sucked up by a powerful exhauster.

The conversion of old papers into pulp is a well-known process; of interest here are processes of removing ink and coloring matters, so that the pulp obtained will be white, and adapted to the manufacture of clean, white papers without previous treatment. To effect this solvents must be added to the pulp; such materials are a necessary part of the special appliances for removing dissolved ink and coloring matters. In some cases baths of various kinds are employed through which the paper is led by means of an endless belt or cloth. After passing through baths, such as oxalic acid and glycerin, potassium permanganate, lead acetate, and aluminum sulphate, the paper is compressed between rolls, and afterwards dried between heated rolls and glazed. These baths, however, are not likely to find much further application, at least in the re-manufacture of old papers from pulp which is made into new paper in the machine; they are not without originality as means of restoring printed and written papers. All these baths are to make the paper fit for writing after drying and glazing. The process appears to be very detailed and expensive, involving labor beyond the results achieved.

In another patented process there is a device for washing the whole stuff and removing the dissolved ink. The paper is made into a suspension, opening up the fibres and dissolving the ink, so that it can be washed off without any loss of fibre. The fibres are washed on a screen, in the form of a cage or an endless wire, whereby the water is circulated from below upwards against the wire mesh. This operation enables the impurities to pass easily through the screen, while the loss of fibre is reduced to a minimum.

In patent 316,469 the cooked pulp is washed in soap solution in a vat, while hot water is introduced into the vessel from the bottom of a liquid supply chamber. The water flows away again at the top. Owing to this circulation of water, the fibres are maintained in an open state, so that the ink dissolved in the liquor separates easily from them, the color flowing away at the top with the water. The fibres then gradually fall to the bottom. When fresh hot water is introduced the disintegrated fibres are again forced upward. The process may be repeated as often as desired, and the washing continued, until all the ink has been removed.

According to patent 312,618 the waste paper is ground in a hollander and then introduced into stuff-chests provided with mixers. An alkaline solution is added in such strength that for each liter of water not more than 2 kg. of caustic soda, or an equivalent amount of other salts, is present. The solutions should have a temperature of from 45 to 65 C. The solution is then mixed thoroughly with the pulp and the fluid drawn off. The pulp is transferred to movable screens and washed with fresh, cold water, with the result that the residues of ink are completely eliminated.

In another process 100 kg. of old papers are alternately upened up in the hollander to a thick stuff by the addition of soda lye. The stuff is not ground, but beaten, the rolls being raised. The water is then removed from the pulp in a washing machine, in which the ink is completely dissolved and eliminated. Simultaneously the suspension of paper is sprayed for 10-20 minutes with fresh water. In this process not only is the ink removed, but also size and leading and a certain portion of the finest wood fibres are lost, involving a loss of 18-25 per cent. according to the grade of paper. A special feature of the process is the improvement of the fibres, for wood pulp acquires a property like pure cellulose through this method of treatment with lye.

Although these processes are designed to evolve a bright, transparent pulp out of old written and printed papers, the problem can hardly be regarded as fully solved. Progress is often slow and perfection is gained by knowing the successes and failures of others as well as one's self.

Fire Prevention in Pulpwood by Means of Artificial Fog

By F. J. HOXIE, Boston.

(Continued from last week.)

Wood is Filled With Cell Cavities Like a Honey Comb.

Wood is not an homogenous solid but when cut across the grain has the appeareance of honey comb, the interior of the cells being filled with air in the case of wood below fiber saturation and the wood substance which forms the walls of the cells containing more or less water. When spruce wood contains about 30 per cent by weight of water the wood of the cell walls is just saturated. With from 30 to 65 per cent of moisture in spruce wood, water is found in the cell cavities. Figure 7 is a photo-micrograph of spruce cut across the grain showing clearly the air spaces or cell cavities and the wood substance separating them. The wood substance of the cell walls, like cotton, wool and silk, when below the fiber saturation point comes to equilibrium with the moisture in the surrounding air, taking up more or less water according to the relative humidity of the air, the wood absorbing water as the relative humidity increases and giving it up as it decreases. The amount absorbed varies somewhat for different woods but for the average relative humidity of out of doors air of about 65 per cent, spruce wood protected from the weather will contain from 6 to 12 per cent. of water. Above the fiber saturation point is a constant loss of moisture when the wood is exposed to the dry air. The rate of this loss depends on the relative humidity of the air. At the air saturation point of 100 per cent relative humidity, no water will be given up by the wood as it will be impossible for water to evaporate from the wood into an atmosphere already saturated with water. Rotten wood or punk wood apparently has a rather greater tendency to absorb water from a saturated atmosphere than sound wood, therefore such wood remains wet in a saturated atmosphere and also absorbs liquid water like a blotting paper far more quickly than sound wood. If the atmosphere surrounding a log pile can be kept at the saturation point there will be no tendency for the wet wood to dry out on the surface or for the wet punk wood to give up its moisture. The most practicable way to attain this desirable end is to keep the log pile continuously covered with a blanket of artificial fog consisting of very fine drops of water which float in the air and are carried by it over the log pile. This fog can be formed by spray nozzles which beat up water into fine droplets as shown in figures 8 and 9.



Figure 7.—A cross section of spruce wood highly magnified, showing the air-filled cell cavities and the thin honey-comb-like walls of wood separating them.



Figure 8.—Showing a spray nozzle discharging two gallons of water per minute at a pressure of 70 pounds. Very slight wind.

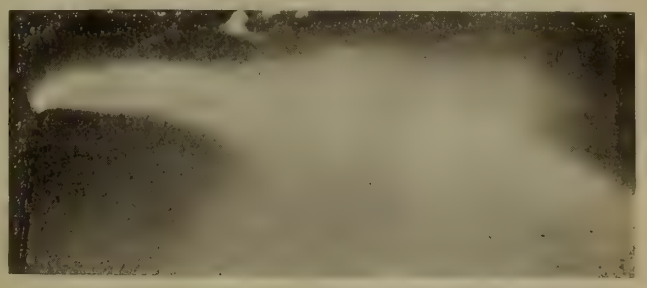


Figure 9.—Showing a spray nozzle discharging one quart of water per minute at a pressure of 70 pounds with summer afternoon breeze. Note fineness of spray and wide distribution.

In order to determine how much water will be required to maintain this atmospheric saturation over the pile, an approximate idea can be obtained from the average summer evaporation from the surface of ponds. Such data has been collected for different parts of the country by water works engineers and it shows an average evaporation in August for the eastern section of the United States and Canada of about four gallons of water per minute per acre. The average surface area of a 10,000 cord conical log pile is about 2½ acres which would therefore require about 12 gallons of water per minute to supply the August evaporation. With a factor of safety of 5 to provide for spray carried away by the wind and other losses and irregularities, 60 gallons of water per minute applied in fine spray should be sufficient to keep the pile continuously wet.

Several experiments are under way on this method of wetting. The object is, first, to keep the wood wet in order to prevent ignition by small sparks, and second, to keep the season cracks closed and the wood cells as nearly full of water as possible to slow down the rate of combustion as well as fungus activity. Exact figures on the upper moisture limits of fungus growths are lacking but, judging from the way that tank staves

and moist roof planks rot through the middle there is an amount of moisture considerably short of absolute saturation or a water logged condition of about 65 per cent at which fungus growth is considerably retarded. See figures 10, 11 and 12.

The value of spray from a fire protection standpoint consists first, in keeping the punk wood in the pile, which is the common source of ignition too wet to ignite by means of small sparks. It will also have the advantage of keeping the surface of the pile so wet that if a fire should originate from exposure it would progress so slowly in its early stages as to give time to get hose streams or monitor nozzles into service. These should be conveniently located about the pile and on it so that large streams can be quickly directed on any point of its surface whatever the conditions of the wind. Most of the large log pile fires have occurred in summer weather indicating that the dryness of the wood is the important factor.

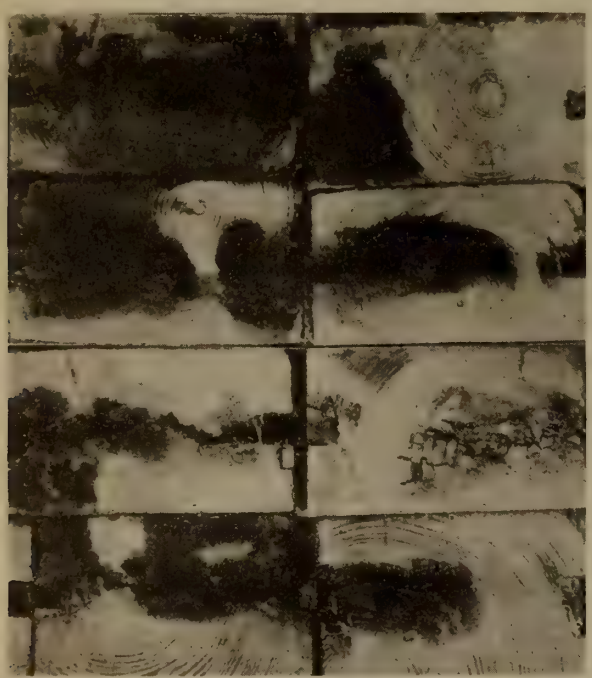


Figure 10.—Southern pine planks from a paper mill roof showing a well defined line of rotted wood through the center of the plank where the moisture was favorable for fungus growth. At the top it was too wet and at the bottom too dry.

It will be possible to install a monitor nozzle and spray nozzle system over log piles at a relatively small expense. This will be following the same methods that have been used with sprinkler and hydrant systems that have been in successful use for the fire protection of mills except that fire "prevention" by means of continuously operating open sprinklers will be expected to be more efficient than fire "extinguishing" by automatic sprinklers which are only brought into service after the fire starts.

On log piles put up by a stationary stacker this stacker can support the fire service pipe supplying monitor nozzles and also supplying the spray nozzle system. The spray heads deliver much less water than the automatic sprinkler, requiring not over ½ gallon per minute as compared with 20 gallons for the automatic sprinkler. This water can be supplied by ½" branch pipes for a common sized pile. A permanent system which suggests itself as highly practicable where fixed conveyors are in use, is to attach the ½" pipes to steel cables from the conveyor to the ground at a sufficient height above the log pile to prevent



Figure 11.—Above showing plank from the bottom of a water tank rotted along a narrow line where the water content was favorable for fungus growth.

damage from the falling logs. the pipes being spaced about 30 feet apart along the conveyor with heads about 30 feet apart along the cables, these heads discharging ½ gallon per minute each.

Where movable stackers are used the heads and monitor nozzles can be fed from a large fire service pipe supported on a plank runway resting on the logs at the top of the pile, and ½" pipes supplying the spray nozzles extending down the pile and resting on the wood. These pipes being put up as the pile is made and taken down as it is taken down. Spray heads should be selected which break the water into the finest possible spray so as to get the most efficient use and the best distribution. They should be located from 5 to 10 feet above the surface of the pile to get a satisfactory distribution, the wind being the important factor in distributing the water. The following photographs (figures 13 and 14) show spray nozzles variously spaced. Those in figure 14 are not high enough, hence the dry areas clearly visible between the heads.

Fire Prevention Better than Fire Extinguishing.

Fire prevention by means of water spray has far greater possibilities in preventing pulp wood losses than fire extinguishing. To extinguish a fire in a large pile of dry pulp wood when the fire is well under way, which is commonly within ten or fifteen minutes of the time it starts, is almost if not quite impossible. Each pound of wood will require a gallon of water to absorb the heat which it generates in complete combustion. The velocity of combustion in the large log piles which have been destroyed by fire has been surprisingly uniform. The variations appear to be more dependent on the water contained by the wood or the amount of oxygen contained in the surrounding air than the water applied in hose streams. Two of the slowest pulp wood fires burned 14,000 and 17,000 pounds of wood per minute. In the first case the wood contained in the neighborhood of 50 per cent of water and was fought with hose steams; in the second case the pile was ignited by a forest fire. The wood contained about the same amount of water and no hose streams were used, but the surrounding atmosphere was doubtless considerably impoverished in oxygen by the forest fire. A factor in the slowness of the first fire was doubtless the bark on the wood which somewhat clogged the spaces between the sticks and cut down

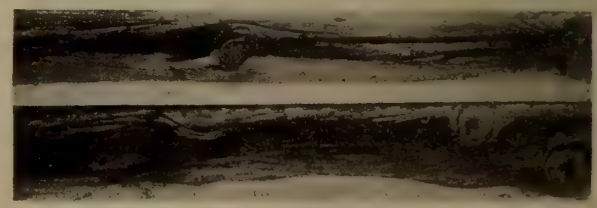


Figure 12.—Two spruce planks from a weaving mill roof. Note center of rotted wood with sound wood above and below where the moisture was too great and too little.



Figure 13.—Log pile continuously wet by spray nozzles, spaced 25 x 30 feet, made of brass ½ inch pipe caps with three 1-32 inch holes.

the draft. Two other large fires in which the wood was somewhat drier and free from bark burned at 25,000 and 28,000 pounds per minute with hose streams in continuous service, which shows a remarkably constant velocity. It also shows that it would be necessary to apply water to such a fire at a rate of about 30,000 gallons a minute with little effect until the wood was practically all burned. This demonstrates that when a large log pile is well under way it is impossible to stop it with any number of hose streams commonly available and that the only practicable means of avoiding serious loss is to keep the surface of the piles sufficiently wet to prevent them from becoming ignited and to have protective appliances instantly at hand to stop a fire in its early stages.

Spray nozzles requiring but a half gallon of water per 900 square feet of log pile surface can be used with effect on isolated log piles at railway sidings and in the woods where now no practicable form of protection is available. Sufficient water at the required pressure can be supplied by a wind mill and a tank or a small gasoline engine.

Conclusion.

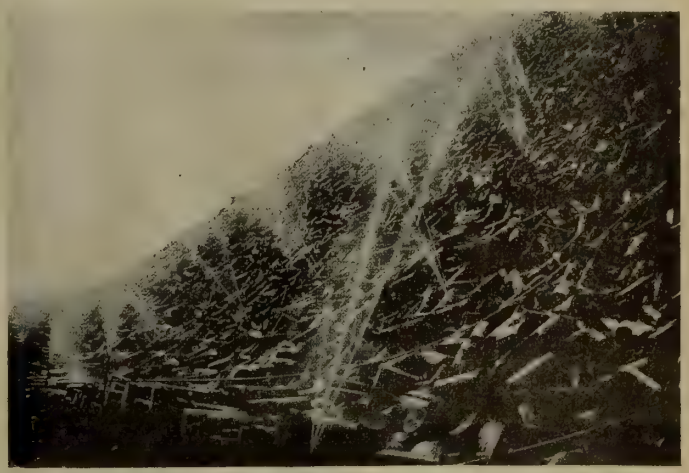
Spray nozzles have undoubted possibilities for cheap and effective log pile protection.

Experiments are now underway at six large paper mills, at least, on the use of spray nozzles, the object being to determine the most effective spacing arrangement of piping and capacity of heads. Results thus far indicate that two quart heads as manufactured by the Spray Engineering Co., spaced 30 feet each way and elevated five feet above the surface of the pile, will give satisfactory service with a pressure of from 50 to 70 pounds at the head. ½" branch pipes feeding 5 to 8 heads appears to be large enough. The main feed pipes should be large to supply monitor nozzles and to keep down the water velocity to prevent carrying sediment in suspension which would clog the nozzles. Such wetting of large piles of wood, wet when stacked will not increase rotting but rather reduce it.

Wood which is to be kept kept dry had best be piled in low well separated piles with good hydrant protection.



Figure 14.—Spray nozzles using 2 quarts of water per minute, each, spaced 30 feet each way. The surface is not quite covered, due to the unequal distribution from insufficient elevation. Very much better distribution was obtained by elevating the nozzles about 6 feet above the pile.



Lake Superior Paper Co., open sprinklers in operation. (See note.) Three quarter inch pipe distributing system. Nozzles are ordinary pipe caps drilled with 1-32 inch holes.

Note:—The following paragraphs from the Quarterly of the National Association of Fire Underwriters, describe the open sprinkler protection for a pulpwood pile as employed by the Lake Superior Paper Co., Sault Ste. Marie, Canada.

The photographs on the opposite page (only one shown here) show an excellent application of open sprinkler protection for pulpwood storage—indirect forest preservation. This installation is along the lines suggested in Mr. F. J. Hoxie's article in the July "Quarterly," entitled "Log Piles: Their Hazards and Protection," but antedates the publication of this article, having been installed in June of this year.

This pile constitutes the entire storage of the company in this locality, and is reserved for winter use. The open sprinkler system shown is operated continuously during the summer months. The wood of this pile will not be removed until winter, and the piping is so arranged that when necessary it can be readily moved. The pile is eighty-five feet high, five hundred and forty feet long, has a maximum width of three hundred feet, and contains approximately thirty-two thousand cords. It is protected by a system of 3-inch feeder mains laid along and around the base of the pile, with ¾-inch pipes laid over the pile connected to these mains at about 20 foot intervals. These ¾-inch pipes are provided at 15 foot intervals with 18-inch extension nipples set vertically. Each nipple is capped with a pipe cap, perforated with four 1/32-inch holes slightly peened to give a spray.

The system is supplied by an eight stage, motor driven centrifugal pump with 2½-inch discharge. The pump has a rated capacity of 210 gallons per minute discharge against a 250-foot head, but is not being operated at maximum capacity.

British Trade News

(From our London Correspondent.)

Some weeks ago I commented on the attitude taken up by certain Norwegians, who stated through their official organ in London that they did not like to see British capital invested in their country. Information has now reached me that a Norwegian syndicate is arranging to spend about $10,000,000 at Alexander Bay in a big pulp construction mill. Do Newfoundlanders and Canadians know it? I am sure they will not object to the investment.

The Smiling Picture.

The very fine picture of the Prince of Wales, which was taken by a very old friend of mine, Lieut. Brooks, while the Prince was on his tour in Canada, has been adopted by a good many paper firms in the United Kingdom as a suitable portrait for their new year calendars. The picture shows the Prince smiling, with a cigarette in his mouth, as he looks up to acknowledge a joke passed by a Canadian soldier on him. When Lieut. Brooks returned to this country with it, and the Newspaper Proprietors' Association took charge of it, the sales for charity have been very considerable. Naturally some of the paper manufacturers and merchants, as well as many pulp men, have been very keen on securing it—particularly as the picture emanated from Canada.

The sons of members of the London Corporation, who served in the recent war, have had the high honor of the Freedom of the City of London conferred upon them.. There are several prominent paper men among those war heroes, and the ceremony of conferring the Freedom was full of interest and was well attended.

New Machine Delivered.

Messrs. Wm. Nash, Cray Valley Mill, St. Paul's Cray, Kent, have just had delivered to them from Messrs. James Milne & Co., Edinburgh, a new paper machine. I hear it is a fine piece of engineering work. Messrs. Milne have machines in hand for four other British firms and one for abroad.

Technical Education.

The Aberdeen Chamber of Commerce has received a letter from the Technical Section of the Papermakers' Association (Aberdeen area), expressing appreciation of the Chamber's efforts to encourage technical education by arranging a course of lectures on the important subject of engine and boiler management, and the economic use of fuel.

Paper Imports and Exports.

The imports of paper for November show a steady increase. Printing and writing paper was imported to the extent of 2,254,004 cwts.; printings and writings, not on reels, 283,188 cwts.; paper hangings, 3,237 cwts.; coated papers, 29,833 cwts.; packing and wrapping paper, 1,745,608 cwts.; strawboard, 2,282,560 cwts.; millboard and wood pulp board, 953,231 cwts.; other papers, 62,431 cwts. Canada enjoys a good share of the millboard and woodpulp board trade.

The exports are also keeping at a good steady figure. Writing paper was shipped abroad to the extent of 137,611 cwts.; printing paper, 365,564 cwts.; packing and wrappings, 226,155 cwts.; paper hangings, 58,729 cwts.; paste, mill and carboards, 38,112 cwts.

The export trade is receiving considerable attention at the hands of the British millowners just at present. No doubt the dullness in the home market has caused this liveliness in export circles.

The Pulp Market.

The depressed state of the paper market in the United Kingdom is still reflected in the woodpulp market. Prices show no change, and very little business is being transacted. Good supplies of groundwood are arriving from Canadian sources at British ports.

Canadian Boards.

The following supplies of cardboard, pasteboard, and strawboards have reached England during November—Strawboard, 303 cwts. at £550; cardboard and pasteboard, 500 cwts. at £700; millboards, 13,059 cwts. at £26,442. The activity in the German paper industry is causing some uneasiness in paper and board circles in London. German paper on the market today is selling much below the price quoted for British and consequently some alarm has been caused.

Mr Howard Smith in London.

Mr. Howard Smith, head of Howard Smith Paper Mills, is on a visit to London, along with Mrs. Howard Smith, Mr. Smith has been telling the trade something about what his mills can produce, and it makes interesting reading.

THE ESTIMATE OF DRYNESS IN WOOD PULP.

An interesting reply to French claims against Finnish manufacturers of wood pulp is published in the Paper and Timber Goods Journal of Helsingfors. It is worthy of note that these claims, which were made on the ground that the bales were well below the guaranteed proportion of air-dried pulp, amount to more than 300,000 marks in the case of the Varkaus mill alone. The facts appear to be as follows: In the course of the year the Varkaus mill made large deliveries of wet wood pulp to France. Certain deliveries were followed by claims based upon analytical tests made in the Research Laboratory of the Chambre de Commerce at Paris.

Sindall and Bacon analysed a lot of 295 bales, giving an absolute dry pulp of 49,37 per cent., and total moisture of 50,63 per cent. As the deliveries to France are made on a guarantee of 44,44 per cent of air-dried pulp, or 40 per cent of absolute dry, the product corresponds to the specifications.—Finsk Pappers—och Travarutidskrift November 30, 1920.

CHARGE CROWN LAND CUTTING.

Fredericton, N.B., Jan. 7—Charges that American lumber companies operating in York County along the New Brunswick-Maine international boundary were illegally cutting pulpwood on Crown lands and exporting it to the United States were made today at a meeting of the York County Council.

Councilor Wetmore of North Lake declared that the wood was hauled through private woods to the border so as to make it appear that it was cut on privately owned lands and therefore eligible for export. He demanded that the Provincial Government take steps to stop this practice.

Councilor Wetmore said that as the United States was placing a heavy discount upon the Canadian dollar, the time had come for "Canadian citizens to strike back in every possible way."

Warden Everett declared during the discussion that "our resources are being taken out of the country while we sit back and watch it going on."—N. Y. Herald.

The Event of the Year

PROGRAM OF ANNUAL MEETING

Technical Section of Canadian Pulp and Paper Association, Wednesday and Thursday, January 19th and 20th, 1921, Ritz-Carlton, Montreal.

WEDNESDAY, JANUARY 19th, 1921

9.30 a.m.—Business Meeting. Ball Room. Address of Chairman, Minutes of Previous Meeting, Secretary-Treasurer's Report.

Reports of Committees.—Committee on Program, Mr. O. Rolland; Committee on Education, Mr. T. L. Crossley; Committee on Testing Moisture, Mr. E. B. Slack; Committee on Abstracts and Publications, Mr. J. N. Stephenson; Committee on Mechanical Standards Mr. John Stadler; Committee on Chemical Standards, Mr. A. G. Durgin; Committee on Statistics, Mr. S. L. Burns; New Business; Election of Officers.

Paper by F. J. Hoxie.—"Insurance of Pulpwood". Mr. Hoxie is well known to all paper men and his subject is a timely one. He will give plenty of illustrations of methods of spraying wood piles.

Paper by J. L. Gartland—"Microscopy and its relation to the manufacture of Pulp and Paper." Mr. Gartland has studied this subject for years, and in his paper will not only cover the mechanism of the microscope, but will also discuss the possibilities of its use in mill work.

Mr. H. N. Lee, whose work in the field of microscopy is well known, will also take part in the discussion.

1 o'clock.—Luncheon in Grill Room.

Paper by W. B. Campbell.—"Beating."

Paper by K. G. Wilen.—"Strength Testing of Pulp."

8.30 p.m.—Informal Smoker, Grill Room.

THURSDAY, JANUARY 20th 1921.

10 o'clock.—Paper by F. G. Warburton.—"Speed Interlock as applied to Paper Machinery Drives." Mr. Warburton is an authority on electric drives, and his paper will prove of special interest to all paper mill men.

1 o'clock.—Luncheon, Grill Room.

Paper by Howard S. Taylor.—"The Ventilation of Paper Machine Rooms". Mr. Taylor is an old favourite of the Technical section, and his papers have always proved of special interest. The present will be no exception.

Paper by C. W. Burroughs.—"Experiences in Using various types of Power Plant Appliances". Mr. Burroughs has had exceptional opportunities for studying the many accessories available for power plants.

Program of Eighth Annual Meeting of Canadian Pulp and Paper Association, Ritz-Carlton Hotel, Montreal, January 21st, 1921.

FRIDAY, 21st JANUARY, 1921.

10.00 a.m.—Business Meeting. Vice-Regal Suite, Second Floor. Minutes of Last Meeting. Presidential Address: Mr. Geo. Chahoon, Jnr.

Reports of sections.—News Section, Mr. Geo. M. McKee; Chemical Pulp Section, Mr. T. J. Stevenson; Mechanical Pulp Section, Mr. J. A. Bothwell; Book and Writing Section, Mr. H. F. E. Kent; Board Section, Mr. J. F. Taylor; Coated Section, Mr. Geo. Pauline; Felt Section, Mr. W. R. McNeil; Wrapping Section, Mr. F. J. Campbell; Tissue Section, Mr. Geo. Carruthers; Technical Section, Mr. L. H. Shipman; Woodlands Section, Gen. J. B. White.

Other Reports.—The Committee on Research.—Col. C. H. L. Jones, The Secretary's. New Business. Election of Officers.

1.30 o'clock.—Luncheon, in the Ball Room. Speaker: Gen. Sir Arthur Currie, K.C.M.G.

7.15 p.m.—Reception by the Officers.

7.30 p.m.—Dinner in the Ball Room. The price of the Dinner is $10. No seating reservations accepted after Thursday, 13th Jannuary, 1921.

Sectional Meetings.

WEDNESDAY, 19th JANUARY:—10 o'clock:—

Technical Section Meeting; Ritz Carlton Hotel; Woodlands Section Meeting, Windsor Hotel, Ladies Ordinary; Bag Section Meeting, Association Rooms. —2 o'clock:—Quebec Forest Protective Association; St. Maurice Forest Protective Association, Windsor Hotel, Ladies Ordinary; Wrapping Section Meeting, Association Rooms.—3.30 o'clock:—Tissue Section Meeting, Association Rooms.

THURSDAY, 20th JANUARY, 1921:—10 o'clock:—

Technical Section Meeting, Ritz Carlton Hotel; Canadian Forestry Association, Windsor Hotel, Ladies Ordinary. Felt Section Meeting, Association Rooms; Cost-Keeping Committee of Newsprint Service Bureau, Blue Room, Windsor Hotel; Chemical Pulp Section, Vice-Regal Suite, Ritz.—2.30 o'clock:—Book and Writing Section, Association Rooms; Mechanical Pulp Section, Vice-Regal Suite.—4 o'clock:—Board Section, Vice Regal Suite.

FRIDAY, JANUARY 21st, 1921:—10 o'clock:—

Eighth Annual Meeting C. P. & P. A., Vice-Regal Suite.—12 o'clock:—Coated Paper Section.—1 o'clock: —Luncheon, Ball Room.—3 o'clock:—Newsprint Service Bureau Meeting, Vice-Regal Suite. (The Newsprint Section of C. P. & P. A. will meet during the afternoon.)—7.30 o'clock:—Eighth Annual Dinner.

BETTER EXPRESS SERVICE AIM OF RIGHT WAY PLAN.

Shippers in every industry using express service, will be asked to co-operate in the "Right Way Plan," a new educational movement about to be inaugurated in the express business, by the American Railway Express Company.

Special emphasis is to be laid on what is called "Starting express shipments right," in which shippers will be asked to give special attention to complete and accurate addressing of shipments and to the packing rules laid down in the Express Classification, authorized by the Interstate Commerce Commission.

The carrier announces that having received shipments turned over to it in proper condition for shipping, it proposes to see that while in its hands all business will be carefully guarded, and expeditiously handled to destination. Numerous placards and pamphlets detailing the correct shipping methods will be distributed to express users.

This is considered an opportune time in the express business to call the attention of express employes to proper methods established by the carrier, for the handling of the business. Under the Right Way Plan selected employes, expert in their individual lines, will take a prominent part in a series of meetings to be held throughout the year, the first of which is called for January 11, 1921.

Technical Section

REVIEW OF RECENT LITERATURE.

PATENTS.

A-3, K-3. Process for obtaining paper pulp. Fr. patent No. 495,867, J. C. DURERE, F. F. ROBERT, C. FABRE, France, June 27, 1919. Chimie & Industrie, **4**, 516, (Oct. 1920). Two grades of pulp are prepared by two successive treatments of furze (a plant which grows abundantly on barren soils): 1) By the action of dil. NaOH (2-3%) under press. (2-3 kg.) for 5 hrs.' a first grade of pulp obtained; it is long-fibered and can be used as a rag substitute in the manuf. of paper pulps: 2) The residue from the 1st treatment is crushed and may or may not be cooked with NaOH under press.; this yields a 2nd grade pulp which can be used for the manuf. of cellulose acetates or plastics.—A.P.-C.

A-15. Alkyl ethers of starch. CLARENCE J. WEST. Paper, **27**, No. 5, 16, 36, (Oct. 6, 1920). A description of the prepn. and properties of alkyl ethers of starch, covered by U. S. patent No. 1,350,820, issued to Leon Lilienfeld, Vienna, Aug. 24, 1920. The Raw materials to be used consist of all carbohydrates of the type $(C_6H_{10}O_5)n$ (with the exception of cellulose), derivatives of these carbohydrates and materials containing such carbohydrates, either dissolved in suitable solvents or undissolved. The process consists in treating the carbohydrates or their derivatives with alkyl salts of inorg. acids, or other suitable alkyl esters, in the presence of basic substances, and thereafter isolating the alkyl ethers of the carbohydrates from the reaction mixt. Probably in many cases mixts. of various alkyl ethers of starch are produced. Mixed alkyl ethers of starch are produced by allowing 2 or more inorg. acid esters or other suitable esters (differing from one another as regards the alkyl radical) to act upon starch or its derivatives; or by producing alkyl ethers of starch containing free OH groups with one or more similar alkyl radicals, and then treating them with alkylating agents containing other alkyl radicals. The resulting ether possess an extremely great variety of properties according to the no. and nature of the alkyl radicals linked, ether-fashion, with the carbohydrate molecule, and also according to the particular carbohydrate employed. They all have in common an extremely high degree of stability, neutrality and indiff., and are relatively non-flammable. Some of its many possible uses are enumerated.—A.P.-C.

A-16. Acid-resistant alloy. U.S. patent No. 1,351,811 ARRIGO TEDESCO, assignor to Societa Anonima Stabilimenti Biak, Turin, Italy, Sept. 7, 1920. Chem. Met. Eng., **23**, 847, (Oct. 27, 1920). The alloy consists of Cu 35-44%, Fe 1.5-4.75%, W 3-6%, Ni 60. 5-45 .25% and is known as "biakmetal". Alloys of such compn. in cast condition have a tensile strength of about 55 kg. per sq. mm. and an elongation of about 20%. They may be forged and rolled both hot and cold. After drawing, the tensile strength in some cases exceeds 100 kg. per sq. mm. The alloy is said to resist the action of acids as follows: H_2SO_4, any strength at. temps. under 100°C; HCl, AcOH, citric and tannic acids any strength at any temp.; cold HNO_3, up to 1.40 sp. gr.—A.P.-C.

A-16; E-U. Acid-proof cement. U. S. patent. No. 1,287,995, A. E. HOLLEY and H. W. WEBB, assignors to Chance & Hunt, England. Chimie & Industrie, **4**, 506, (Oct. 1920). A cement consisting of about 17 parts by wt. of siliceous acid-resisting material, 0.12 part $CaSO_4$, 3 parts of 34°Be water glass.

E-2; L-7. Sulfite waste liquor as a precipitant for artificial threads, ribbons, films and sheets. Br. pat. No. 145,627, M. MUELLER, Finkenwalde, near Stettin, Sept. 1, 1920. Chem. Met. Eng., **23**, 1036, (Nov. 24, 1920). In the manufacture of artificial threads and of ribbons, films, or sheets from viscose, the soln, is introduced through suitably shaped apertures into a pptg. bath consisting of sulfite waste liquor to which has been added a mineral acid or an acid salt, e.g., H_2SO_4, H_2SO_3, or HCl. The waste liquor obtained in the manuf. of "sulfite ethers" may also be used. It is preferred to use a waste liquor which is free from CaO, e.g., a Na_2SO_3 liquor obtained when the wood is boiled with $NaHSO_3$ or "by conversion of Na salts from the waste lye of lime"; and the liquor should be concd. before use. Hardening agents such as formaldehyde or $Al_2(SO_4)_3$, and glue, seaweed mucilages, etc., may be added to the pptg. bath; by such additions the sensitiveness of the threads, etc., to water and their capacity for dyeing can be favorably affected.—A.P.-C.

E-2. Method of and means for the de-acidification of raw wood-pulp liquor. Br. patent No. 150,571, B. GRATZ, Nov. 26, 1919. J. Soc. Chem. Ind., 39, 686A, (Oct. 30, 1920). The liquor is allowed to flow along a trough through which the ashes of lignite or other brown coals are transported in an opposite direction by means of a mechanical conveyor. The cost of neutralization is small, and the liquor obtained may be used for prepg. artificial stone.—A.P.-C.

E-2. Manufacture of a material resembling dextrin from cellulose waste liquor. Ger. patent No. 322,688, M. CLAASS, Feb. 15, 1918. J. Soc. Chem. Ind., **39**, 719A, (Nov. 15, 1920). Cellulose waste liquor is improved both in adhesive properties and in color by treatment below 100°C with acids, sulfates, and a sulfoxylate.—A.P.-C.

E-5; F-5 Digester. Br. patent No. 124,676, E. SCHAUFFELBERGER, England. Chimie & Industrie, **4**, 516, (Oct. 1920). A digester for the prepn. of pulp from bamboo, esparto, groundwood, in which the liquor is made to circulate from bottom to top and in which the liquor is sprayed at the top of the digester. The liquor may also be heated in an exterior heater.—A.P.-C.

F-2. Process for the treatment of black liquor. U.S. patent No. 1,298,479, V. DREWSEN, Assignor to West Virginia Pulp & Paper Co., U.S.A. Chimie & Industrie, **4**, 517, (Oct. 1920). The black liquor is concentrated by adding powdered CaO so as to obtain a dry caustic mixt. This is distd. to obtain acetates and other volatile products.—A.P.-C.

F-2. Process for obtaining acetates from black liquor. U. S. patent No. 1,298,478, V. DREWSEN, assignor to the West Virginia Pulp & Paper Co., U.S.A. Chimie

& Industrie, **4**, 517, (Oct. 1920). The liquor is concd. to a sp. gr. of about 1.30, and 10% NaOH and 50% powdered CaO are added to obtain a strongly caustic and porous mixt. After heating to about 250°C, it is cooled out of contact with air and extracted with cold water so as to obtain an acetate soln. of about 30°Be. CO_2 is passed through the soln., the ppt. of $NaHCO_3$ is sepd., AcOH is added to purify the liquor and neutralize the carbonates, and an excess of 5% (of the solids) of powdered CaO is added. The liquor is filtered, concentrated, and the NaAc crystallized out. The mother liquor is acidified with H_2SO_4 and the AcOH distilled off.—A.P.-C.

F-2. Process for obtaining acetates from black liquor. U. S. patent No. 1,293,481, V. DREWSEN, assignor to West Virginia Pulp & Paper Co., U.S.A. Chimie & Industrie, **4**, 517, (Oct. 1920). The liquor is concd. until it contains about 50% solids, and the lignin compds. and $NaHCO_3$ are pptd. by passing CO_2 through the soln., this being done under press. to agglomerate the ppt. The ppt. is filtered off and the liquor is concd. by adding about half its wt. of powdered CaO, thus giving a drying caustic mixt. This is pulverized, moistened, treated with CO_2, heated to 160-200°C, and treated with a small quantity of cold water to extract only the NaAc which is then crystallized out.—A.P.-C.

F-2. Stationary digesters and the like used in paper-making. Br. patent No. 150,782, S. MILNE, June 4, 1919. J. Soc. Chem. Ind., **39**, 719A, (Nov.Nov. 15, 1920). A vertical cylindrical digester has a conical lower portion within which are perforated plates for supporting the grass or like material under treatment. A valve at the lowest part of the digester has a hollow spindle connected at the upper end with a perforated pipe passing into the lower part of the digester. During digestion the liquor drains through the perforated plates and the outer walls, and is returned to the top of the app. by a steam injector or pump; when the process is complete the valve at the bottom is opened and the contents are washed out by water, spent liquor, steam, or air, and forced under press. into the digester through the valve spindle and perforated pipe. —A.P.-C.

F-2. Process for treating black liquor. Ger. patent No. 322,771, H. ACHENBACH, Feb. 16, 1919. J. Soc. Chem. Ind., **39** 686A, (Oct. 30, 1920). The waste liquor passes down a tower, in which it is concd. from about 5°Be (sp. gr. 1.037) to about 10°B (sp. gr. 1.075) by means of furnace gases. It can then be evapd. in the usual app. without frothing.—A.P.-C.

F-5; K-3. Process for the separation of vegetable fibers. Fr. patent No. 506,292, ALBERT NODON, May 25, 1920. Papier, **23**, 228-9, (Oct. 1920). The raw material is impregnated with a conducting soln. containing either a salt or H_2SO_4, the latter helping to remove the mineral matter combined with the incrustants and ensuring a proper conductivity of the whole mass. The impregnated material is placed between vertical Pb electrodes and subjected to the action of an electric current. Through the combined action of the current, of the ozone formed through electrolysis and of the acid soln. the incrusting matters are rapidly oxidized and resinified, thus being rendered soluble in alkalies. The fibers are completely freed by boiling the mass for a few hrs.. in a weakly alkaline soln., without press. The alkaline soaps thus formed can easily be washed out with cold water. The isolated fibers are slightly colored and are very strong as they have not been appreciably weakened by the alkaline treatment.

H-4. Electrolytic chlorine cell. U. S. patent No. 1,349,597, HERBERT I. ALLEN and KENT R. FOX, Portland, Me., Assignors to Electron Chemical Co., Aug. 17, 1920. Chem. Met. Eng., **23**, 847, (Oct. 27, 1920). An improved form of electrolytic cell for the decompn. of brine consists of a suitable tank, a rectangular, box-shaped cathode having perforated active end, side and bottom walls, and a rectangular tabular anode. Certain advantages result from this construction. For example, practically the entire inner surface of the cathode, including the bottom, sides and end walls, is electrically active and the exterior faces of the cathode are wholly unsubmerged in any body of electrolyte. By providing a water-tight and gas-tight pressure joint between the cathode and the free-board section, it is possible to build up the column of electrolyte in the free-board section so as to secure the desired hydrostatic head as the diaphragm becomes more or less clogged with the impurities in the brine, thus insuring a longer diaphragm life than would otherwise be possible.—A.P.-C.

K-10; K-23. Sizing, waterproofing, dressing, etc., paper, fabrics, etc. Ger. patent No. 321,232, W. SCHMIDT and E. HEUSER, March 15, 1918; addition to 296,124. J. Soc. Chem. Ind., **39**, 653A, (Oct. 15, 1920). The paper pulp or fabric is treated with a solution of tar soap prepd. by saponification of wood-, lignite-, or coal-tar, previously extd. with water. Injurious acid substances may be removed from the tar by distn., and a soap prepd. by incomplete saponification of the tar may be used.—A.P.-C.

K-10; K-23. Sizing and waterprofing of paper, pulps, paper yarns and fabrics. Ger. patent No. 318,923, E. FUES and E. BRAUNMULLER, Jan. 3, 1917. J. Soc. Chem. Ind., **39**, 653A, (Oct. 15, .1920). The paper material is treated with colloids such as dialyzed solns. of hydroxides of trivalent metals, preferably Fe or Cr, with or without the addition of solutions of other, preferably org., colloids.—A.P.-C.

K3. Process for the manufacture of paper pulp from rags, cordage, twine and the like. Fr. patent No. 506,569, ARMAND BOILEAU, (Dordogne), France, June 1, 1920. Papier, **23**, 229-31, (Oct. 1920). The material in a proper state of subdivision is first of all subjected to the action of a very slightly alkaline and rather weak NaOCl soln. This may be carried out cold for a few hrs., and followed by washing with cold water for ½ hr. The material can then be cooked under press. with a relatively weak (as low as 1-2%) soln. of Na_2CO_3, NaOH, $NaHSO_3$, etc., for a relatively short time (2-4 hrs.). Or it may be treated with cold NH_4OH or ammoniacal $NaHSO_3$. It is then washed again and submitted to mechanical treatment. The essential characteristic of the process lies in the prelim. NaOCl treatment, which facilitates and hastens the saponification of the fatty material with which the fibers are more or less covered, thereby reducing the consumption of alkali, and also the press. and time required for the operation.—A.P.-C.

K-3. Utilization of the waste liquors from the alkaline digestion of straw. Ger. patent No. 319,068, S. HERZBERG, Nov. 13, 1917. J. Soc. Chem. Ind., **39**, 654A, (Oct. 15, 1920). Alkaline liquors from the treatment of straw are electrolyzed to obtain the NaOH in a concn. suitable for further use. The degree of evolution of O or of oxidation of org. substances at the anode varies with the strength of the current.—A.P.-C.

(Continued on page 46)

UNITED STATES NOTES

J. R. Carter, treasurer of Carter, Rice & Co., Boston, Mass., was honored last week at a celebration tendered by the trade, his business associates and employes in recognition of his 50th anniversary as a paper merchant. Following a reception arranged by employes of Carter, Rice & Co., Mr. Carter was tendered a complimentary dinner at the Algonquin Club by more than 100 men representative of Boston's paper trade. Mr. Carter began business in the paper field January 2, 1871 in Boston. He has been associated continuously since then with the same concern, known originally as Carter & Rice.

The Beaver Board Companies of Buffalo, N.Y. have received the consent of stockholders to an issue of notes. The proceeds of this issue are to be used as working capital to take care of the increase of business expected by the management during 1921.

O. M. Porter, secretary of the Woodlands Section of the American Pulp and Paper Asociation, reports that the membership of the organization has reached a total of sixty and that the numerous inquiries he is receiving presage a further accretion of members and the early fruition of some of the things planned. These plans include the mapping out of a system of cost accounting in woods operations; the establishment of a woodlands experiment station for trying out new methods and machines in woods operations, and the taking at regular intervals of statistics covering the pulpwood situation generally.

The Flower City Tissue Mills, Rochester, N. Y., through a recently effected reorganization, comes under the control of the owners of the Scottsville Paper Box Board Corporation. A certificate of incorporation was filed at Albany a week ago by the latter concern in which it was capitalized at $1,000,000. The corporation begins operations with $400,000 paid in. The office will be in Rochester and the box board plant in Scottsville. Part of the plants and products of the Flower City mills in Rochester will be taken over by the box board company. The plant of the latter at Scottsville will be enlarged for the manufacture of paper, folder stock and tag board. The Rochester plant will continue to be operated under the old name Flower City Tissue Mills and will continue its production of high grade tissue paper.

Paper firms in various parts of the country followed out their usual practice this year of giving bonuses to their employes. The bonus checks were forthcoming even from several concerns whose plant had been shut down due to the depression. At Menasha, Wis., W. M. Gilbert, head of the Gilbert Paper Company, presented checks to employes, the amounts of which were governed by the tenure of service. Bonus checks aggregating more than $7,000 were distributed to the employes of the Victor Bag and Paper Company at Marinette, Wis. The plant of this concern has been shut down since early in December. The letter accompanying the checks expressed the regrets of the company officials that no definite announcement as to when operations would be resumed could be made. Insurance policies for amounts ranging from $500 to $2,000 were made out on the group insurance plan, effective January 1, for all employees of the Sherman Paper Company, Watertown, N.Y., who have been in service six months or more.

John H. A. Acer, of Montreal, is named as president in a certificate of incorporation filed at Springfield, Ill., January 1, by Acer & Co., Inc., 366 Madison Ave., New York, dealers in wood pulp. The company is to transact business in Illinois, with a capital stock of $100,000, Headquarters in Illinois will be at 30 North La Salle street, Chicago. J. R. S. McLennon, Montreal, is secretary of the concern.

The total production of dyes in the United States in 1919 was more than 63,000,000 million pounds, according to an estimate contained in a report on the development of the American dye industry made public last week by the United States Tariff Commission. This total output of the domestic product exceeds pre-war dye imports by 38 per cent. The industry, states the report, has made marked progress and the dyes produced are of improved quality, giving the consumer better value for his money. Many instances are said by the commission to have been found of a decrease in those dyes relatively easy to make and the appearance of many new dyes. The output of certain dyes is said to have been developed to a point beyond the domestic consumption and large quantities of these were exported, particularly to China and Japan.

William H. McCarthy, of Lowville, N.Y., has been awarded the contract for cutting pulpwood on the $1,750,000 tract of timber in Northern New York, recently purchased by Harry P. Gould for the Gould Paper Company. Camps will be established during the coming summer and the first season should yield a cut of over 10,000 cords. Mr. McCarthy's contract with the Gould Paper Company ends his connection with the Dexter Sulphite and Paper Company which he has served for more than 25 years as a woodsman. The lumbering over the big tract of the Gould Company will be carried on through a period of 12 to 15 years. A state forester will be on the job and the cutting will be done under scientific methods, no trees under 11 inches in diameter being taken.

Paper making improvements that may work out as an important factor in the development of the industry in Maine are declared to have been devised in the laboratory of the Eastern Manufacturing Company. H. E. Fitch of this company has issued the following statement regarding the new discoveries: "Dr. Albert L. Fitch, of the University of Maine and the physics laboratory are helping us to develop an appliance for the measurement and control of the preparation of stock for paper in beaters and refining engines. An apparatus of this kind, if successful, would have a far reaching effect on the pulp and paper industry, as it wuld change the present "rule of thumb" method into scientific procedure."

PULP AND PAPER NEWS

The many friends of Mr. Robert J. Flynn, manager of Messrs. Buntin-Reid Company, Paper jobbers, Toronto, congratulated him on New Years day after having won a strenuous municipal fight at Weston where he was elected to the Mayor's chair. Mr. Flynn has been active in municipal affairs in that town for some time, especially in school board circles.

The death took place in Toronto of Charles Roddy, aged 74, printer and publisher. Deceased, about 37 years ago entered business for himself and established the firm of Charles Roddy & Company, printers and publishers. About two years ago he retired from active business life.

Mr. J. E. Dubuc, who has been on a sea voyage for his health, etc., has returned to Canada in a very optimistic mood. He went from Montreal to Chandler, Quebec, where his company has a sulphite mill.

Ernest Rossitter, assistant general manager of the Brompton Pulp and Paper Co. has gone to California for a much needed rest.

George M. Rose, president of the Hunter-Rose Company, Limited, publishers, was a successful candidate for the Toronto aldermanic race, having been elected for Ward Three.

The head office of the Provincial Paper Mills, Limited, at Toronto, substantially confirms the somewhat exaggerated press despatches concerning big expansion plans under way in the Port Arthur district. An official statement will soon be published in the Pulp and Paper Magazine.

C. B. Thomas, vice-president and technical director of the Riordon Co. is enjoying a holiday in his native land — the Land of the Midnight Sun—C. Howard Smith is in England on business.

The Kaministiqua Pulp & Paper Company is issuing bonds to finance an increase in the capacity of its plant from 25 to 100 tons per day. These three industries with the Fort William Paper Co. and the projected Great Lakes Pulp and Paper Co will make the Head of the Lakes one of the biggest pulp and paper centres in the Dominion.

Almost simultaneously John Stirrett & Sons, who procured the big plant of the Port Arthur Waggon Company, announces that Chicago capitalists have financed a pulp mill of 100 tons per day capacity, and that establishment of this industry will be commenced without delay.

The first of the Pulp and Paper Accessories, Ltd. chip screens to be manufactured in Canada has just been shipped to Price Bros. Ltd.. for installation in their mill at Jonquière, Que. These screens have hitherto only been manufactured in Norway, but are now being turned out by the Dominion Engineering Works, Montreal.

Among the Canadians in New York last week were George Chahoon, jr., president of the Laurentide Company and Geo. F. Steele, general manager of the Canadian Export Paper Co. Mr. Chahoon was seen in Montreal Friday.

Among the outside paper men in Toronto during the week were F. J. Campbell general manager of the Canada Paper Company, Limited, Windsor Mills, John Martin of the John Martin Paper Company, Limited, Winnipeg, and A. L. Dawe, Secretary of the Canadian Pulp and Paper Association.

The Pulp and Paper Mill Accessories, Ltd., Montreal, have sold the patent rights in the United States for the P. A. P. A. Screen to the Valley Iron Works, Appleton, Wisconsin.

H. Biermans, general manager of the Belgo Canadian Pulp and Paper Co. is on his way from New York to France and Belgium. He expects to be back in March.

Guy Tombs, transportation expert of the Canadian Export Paper Co. has been laid up with a carbuncle. (We almost said barnacle). It was no joke.

PUBLISHERS MET WITH PAPER MAKERS.

An important conference of the publishers of trade and class journals and the manufacturers of book papers was held in Toronto last week at the King Edward hotel and the situation regarding supply and prices for the coming year was talked over in a friendly spirit. The publishers set forth their case along the lines that a number of them were paying practically double for their paper to what they were a year ago and, as a consequence of the high cost of production, several journals had been forced out of business. They also stated that they were not able to advance their advertising rates any more as advertisers were not now in a mood where they would pay increased charges and some were contending that the cost of advertising should come down in accordance with the trend of all other commodities and supplies. The publishers argued that Canadian mills should reduce their prices and make new contracts in more favorable terms than the ones now expiring.

It is understood that the manufacturers stated that they would take care of the demand of the publishers for the coming year and set forth the fact that producing costs were still high while raw materials had come down some. It was only now that the mills were beginning to feel the benefit of the reduction in such commodities as soft coal, groundwood and sulphite pulp, rags, etc., after using up their high priced supplies which they had on hand. It is learned that the manufacturers will issue a new price list in a few days and that it will show a reduction from the present schedule.

NEW LAURENTIDE MACHINE MAKING PAPER.

F. A. Sabbaton and Johan Stadler of the Laurentide Co of the Belgo Canadian Paper Co. were in Montreal last Friday on business connected with the Technical Section. Mr. Sabbaton referred to Laurentide's new machine and said it was turning out paper for the New York Times. It was started at 650 feet and had run 6½ hours without a break.

REVIEW OF RECENT LITERATURE.

(Continued from page 43.)

K-18; L-4. The fiber container industry. J. D. MALCOLMSON, Industrial Fellow of the Mellon Institute of Industrial Research of the University of Pittsburg. Paper, **27,** No. 8, 14-5, 17, (Oct. 27, 1920). "A fiber shipping container is a tough, efficient and economical outer package built to withstand the wear and tear of freight, express and parcel post shipment." A brief description of the origin and growth of the industry, of the great saving of lumber it effects, of the raw materials used, and of the methods of manufacture of laminated solid fiber board and of double-faced corrugated board.—A. P.-C.

K-23. Paper allowing of the removal of ink stains. J. SCOTT. Paper Maker, **59,** No. 1, 321-2, (Jan. 1, 1920); Chimie et Industrie, **4,** 515, (Oct. 1920). Heavy white blotting paper is immersed in an oxalic acid solution (1 of acid to 4 of water), drained, and dried in a current of air. The author shown the behavior of this paper and also shows by means of a microphotograph, the appearance of the paper after an ink stain has been removed.—A. P.-C.

K-22. Corrosion-resisting paper. J. SCOTT. Paper Maker, **59,** No. 2, 166-7, (Feb. 2, 1920); Chimie et Industrie, **4,** 515, (Oct. 1920). A paper which can protect metals from oxidation is obtained by impregnating with a mixture consisting of 10-5 per cent of volatile hydrocarbons dissolved in 90-85 per cent of heavy mineral oil (lubricating oils, for example). There is no chemical reaction between the metal and the paper, and the thin oily layer adhering to the metal can easily be removed.—A. P.-C.

R-3. Cost accounting from an executive's standpoint. HENRY D. SCHMIDT, Vice-President, Schmidt & Ault Paper Co., York, Pa. Paper, **27,** No. 8, 16-7. (Oct. 27, 1920). A description of how the Cost Department can and should control the operations of other departments in any industrial enterprise.—A. P.-C.

R-7. Some economic aspects of welfare work. H. P. CARRUTH, General Manager, Mead Paper & Pulp Co., Chillicothe, Me. Paper, **27,** No. 8, 12-3, (Oct. 27, 1920). A discussion of "Welfare Work", mot. "as a sort of general specific for all the industrial ills, but as a part of a general industrial policy which is in line with the trend of the times and in sympathy with the modern idea that workmen are regular human beings, thinking, and reacting like the normal man in any walk of life."

PATENTS.

K-3. Utilization of the waste liquors from the alkaline digestion of straw. Ger. patent No. 321,453, S. HERZBERG, March 28, 1919; addition to 319,068 (preceding abstract). J. Soc. Chem. Ind., **39,** 654A, (Oct. 15, 1920). The liquor, or at last the portion to be used as anodic bath, is treated in the cold with mineral acid or bisulfate and heated to 70°C; it is then filtered from pptd. org. substances and electrolyzed. The pptd. lignin acid can be utilized, and if NaCl soln. is used as anodic electrolyte the Cl produced may be employed in the dissolution of chopped straw previously treated with milk of lime.—A.P.-C.

K-6. Reclaiming writing paper. Ger. patent No. 321,545, July 26, 1919. HEINRICH GOTHE, Dusseldorf. Paper **26,** No. 6, 30, (Oct. 13, 1920) and J. Soc. Chem. Ind., **39,** 653A (Oct. 15, 1920). The paper fastened on strings or bands, is passed through 4 baths. The first bath contains 2.5 kg. of oxalic acid to 25 kg. of water, to which 2.5 kg. of glycerine are added. This bath dissolves the ink. The next bath is composed of 25 kg. of water and 0.25 kg. of $NaMnO_4$, to be gradually dissolved. The 2nd bath removes all traces of ink. The 3rd bath holds 2.5 kg. of $PbAc_2$ in 25 kg. of water. The 4th bath contains $Al_2(SO_4)_3$. The last 2 baths are for the purpose of restoring the paper to its former quality. After being dried and repressed it may be used over again. It is claimed it is then as good as new.—A.P.-C.

K-6. Method of reclaiming paper stock. U. S. patent No. 1,351,092, C. BASKERVILLE and C. M. JOYCE, Aug. 31, 1920. J. Soc. Chem. Ind., **39, 686A,** (Oct. 30. 1920). Waste inked paper is satd. with a mixt. of kerosene, borax, soap and water.—A.P.-C.

PAPER COMPANY URGES PRACTICE OF FORESTRY.

The advertisement which is copied below is a full page advertisement on the inside cover of "American Forestry" of November, 1920. It indicates the interest of manufacturers of paper in the United States in the application of forestry to forest lands. The American Paper and Pulp Association is very appreciative of this advertisement, though it has not learned to whom it should extend its thanks. The advertisement is as follows:

PRACTICE OF FORESTRY WILL PROVIDE FOR THE FUTURE OF THE PULP AND PAPER INDUSTRY.

The problem of the timber supply affects every pulp and paper manufacturer in America, whether he owns timberland, purchases pulp or makes it.

It is a vital problem to the whole paper making industry and of special and immediate importance to the manufacturers of New England and the other eastern states.

Pulp and paper making is the one great industry using wood as a raw material in which there is much hope for the practice of forestry as a commercial undertaking upon privately owned land.

Pulp and paper manufacturers should concentrate on protecting their timberlands from fire and engage in timber planting and timber growing operations under the direction of qualified foresters so they may have a future supply of wood for their mills.

They Should Earnestly Support the Remedial Measures Proposed by the American Pulp and Paper Association.

(Paid for by a paper company in the best interests of the industry).

CATALOGS RECEIVED.

The Pulp & Paper Magazine acknowledges the receipt of Bulletins 1 and 2, in an attractive binder, from the Williams Apparatus Co., Watertown, N. Y.

Another interesting catalog is the sample book of Berkshire Cover Paper for which the Beveridge Paper Co., Montreal, is the agent for Eastern Canada. This is a deckle edge paper in two thicknesses and seven colors.

The Hughes-Owens Co., have arranged for an exhibit and demonstration of the Widney "Modulimeter" for paper testing at the Ritz-Carlton Hotel, next week, while the Technical Section is in session. Other articles of interest to the pulp and paper men that will be shown are chemical laboratory apparatus, glassware, microscopes and photo-micrographic apparatus.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, Jan. 8.—Paper trade conditions are in a state of evolution just now. The reign of high prices is at an end and the next few days will likely see reductions in paper lines hitherto untouched by falling prices conditions. Last week, wrapping paper, tissues, toilet and some other lines took a tumble as a result of the quiet period and lessened demand, and in sympathy with the falling prices in most other commodities. Book paper, ledgers and bonds will be the next to go under the knife and preparations are already under way by both the manufacturers and the jobbers to shave the prices in accordance with existing conditions. A new price list for fine papers will likely be issued next week and the downward revision will be worked out on present day costs and the new schedule will embrace practically all the lines of the finer grades of paper. The Pulp and Paper Magazine is informed that the new schedule will not be drastic but there will be a trimming in prices to meet present-day conditions and with a view to getting the trade back to a normal basis. There will not be any big reductions. The mills will shave their prices to the jobber and the jobber will reduce his price and take whatever losses there are philosophically. It is recognized in the trade generally that paper prices could not be expected to remain at their present level while other commodities are coming down and manufacturers and jobbers alike are accepting the situation as it exists. It is recognized that while there has been a reduction in raw stock, the overhead expenses remain at a high level, which means that there cannot be any heavy reductions in selling prices. Some lines of raw stock are higher today than they have ever been. Soda pulp may be mentioned as an instance, as high as 12c being paid by some of the manufacturers for that article alone. These conditions will all be taken into consideration in the preparation for the issuance of the new schedule of prices for fine paper next week.

FINE PAPERS.—Manufacturers of book papers, bonds and ledgers are operating with lessened orders but some of them are still running on back orders which will soon be finished up. The public has stopped buying and all the jobbing warehouses are carrying heavy stocks. It is generally expected, however, that buying will be resumed very shortly as a result of price reductions and that business will pick up again in response to the more favorable figures about to be fixed. Stock-taking is in progress generally among the wholesalers and the reductions will be welcomed for the sake of their inventories. The jobber will know the first month in the year exactly where he stands in regard to the value of his stock in the warehouse and his business generally will be on a more substantial basis.

WRAPPING PAPER AND BAGS.—Although orders coming in are small, jobbers in the wrapping paper and bag lines say that they are sufficiently large to constitute a fairly large volume of business. Stocks have been heavy and the buying small for some weeks past but there are signs that business is picking up considerably and the drop in prices is already having its effect in increased business. One jobber reports that wire orders are beginning to come in now and although the lots ordered are comparatively small, the fact that the telegraph is being used, indicates that the point had been reached when stocks of the users had very nearly reached the vanishing point. From now on it is expected that there will be fairly free buying and the wrapping paper trade is viewed optimistically. The decrease in the mill price of wrapping papers represents a cent and a half a pound and fifteen per cent. has been lopped off both paper bags and tissue papers. The manila bag discounts are now 35, 10. 10 and 5 per cent. and kraft bags now carry discounts of 50, 10 and 5 per cent. There is no change in white bags. Grey brown and news counter rolls are now quoted at $8.50: No. 3 manila, $9.50, No. 1 manila $11.50, fibre $10.50 and kraft $11.50, f.o.b. Toronto.

COATED PAPERS.—Although there are not many new orders coming in for the coating paper mills, one mill, at least, reports that it is still working on back orders representing operations of from a month to a month and a half. As yet there has been no drop in prices and manufacturers point out that this contingency will entirely depend upon the pulp and paper market. If the book paper market comes down it is quite likely that there will be a downward revision of coated paper lines. In the meantime the mills are doing a fair amount of business, although in harmony with the paper trade generally, they are going through a somewhat quiet period.

TISSUES AND TOILETS.—Light weight paper mills have no orders ahead to speak of and although there is no stocking by any of the jobbers there is a fair volume of business representing current requirements of the trade. The recent price reductions are not expected to make their effect felt for a few weeks but buying is expected to be resumed on a normal basis in another month or less. Toilets are down fifteen per cent. and tissues from ten to fifteen per cent. Jobbers' prices on tissues are as follows: twelve pound No. 2 manila, 24 x 36, $1.70; 20 x 30, $1.25; ten-pound cap, 24 x 36, $1.95; 20 x 30, $1.35; ten-pound natural sulphite 24 x 36, $2.30; 20 x 31, $1.60; No. 1 white 24 x 36, ten-pound $2.55; 20 x 30, $1.85.

NEW YORK MARKETS.

New York, January 8.—(Special Correspondence)—Probably the most important development in the paper market this week is an improvement in inquiry. Consumers in frequent cases have sounded out mills and jobbers concerning supplies, but, evidently not being in immediate need of paper, have mostly held off in placing orders, so that actual business has expanded but little, if any. Chief activity in the market at present surrounds the arranging of contracts covering deliveries over the course of the next few months. Publishers and printers and other large consumers who purchase the bulk of their supplies on contract are reported meeting the prices named by manufacturers and mill agents without apparent reluctance, and it is authoritatively

stated that some mills have contracted for the major portion of their production for the entire year of 1921.

In this connection, an interesting report was issued by a financial concern in the Wall Street district seveay days ago relative to the largest single manufacturer of newsprint in the United States, which says, in part: "The International Paper Company enters the new year with practically all its newsprint output contracted for twelve months in advance. The slowing up of activities taking place in other lines of business is not reflected in the newsprint industry and mills are running to capacity. Demands for print paper upon the International Paper Company for 1921 delivery were far in excess of its capacity and it was necessary to cut customers 20 per cent. below 1920 contracts. Production this year is expected to approximate the usual 500,000 tons of paper, of which 300,000 tons is news and the balance of various grades running from fine book papers to wrapping material. When the new mill of the company at Three Rivers, Quebec, is completed late this year or early in 1922, it should add approximately 72,000 tons of paper annually to the output."

Aside from contract business, trading in paper during the week has been mainly of routine character and involving in the aggregate a light tonnage. This is not unusual for the first week of a new year and has not served to shake the confidence felt by members of the trade that activity lies ahead. On the contrary, the increased inquiry from large buyers has been taken to indicate that consumers are actually in need of paper and that their looking around among mills and jobbers for supplies and quotations is but a forerunner to more concerted buying in the near future. The head of one of the largest paper distributing organizations in the States expresses the belief that by the end of January "things will be humming" in the paper trade. This authority states that there are bonafide indications that 1921 is to be a banner year for the industry, and that consumption of paper of various kinds during the current year will be of greater magnitude than ever before. It seems significant that opinion runs the same throughout the trade and that nearly everyone connected with the industry, from the jobbing house salesman on the street to officials of the largest manufacturing companies, are possessed of the same sort of confidence regarding the market outlook. And there is no denying that sentiment goes a long way in shaping the conditions of a commodity market!

Very little change has occurred in quotations. Newsprint rules firm at between 7 and 7.50 cents per pound on standard rolls to transient buyers and around 6.50 cents on contract. Publishers are buying as far ahead as mills accept commitments and are taking as large tonnage as is to be had. Fine papers are quiet but quotably steady. Wrappings and tissues are holding their own and manufacturers are not pressing sales even though they are in want of orders. Book papers rule steady in price, and are moving into consuming channels in more or less consistent volume at a quotable basis of about 12 to 13 cents at mills for machine finished book. Boards are unaltered in price at $50 per ton at mills for filled news and $45 for plain chip, and demand, if anything, is on the rise.

Everything would seem to point to paper values having reached bottom for the present movement. Contract prices are holding firm and quotations on spot shipments have steadied to a marked degree. The entire trade is expecting a strengthening up of matters, in view of which it is not surprising that most sellers are waiting for buyers to come to them and that selling pressure is an almost invisible characteristic of the market.

GROUND WOOD.—Mechanical wood pulp prices rule steady to firm at around $100, or slightly less, per ton at producing plants for No. 1 domestic ground wood, and between $85 and $90 ex-dock for imported pulp. No transactions involving large tonnages of spot pulp have been recorded this week but inquiry continues good, and most of the supply offered is finding a ready outlet among consumers, who nevertheless are still cautious buyers while presumably not being in pressing want of pulp.

CHEMICAL PULP.—A distinctly firm undertone marks the chemical pulp situation and there is a decided upward tendency exhibited by quotations on most grades. Producers and importers generally express the belief that stocks at consuming plants are near depletion and that papermakers will soon be obliged to resume buying, and it is stated that recent experiences go to prove that available supplies of pulp are abnormallly light. Another factor developing this week which may have important influence on the market is a strike of marine engineers in Sweden which has almost completely tied up Swedish shipping. Traffic over the Baltic is said to have come to a virtual halt and steamship officials say they will cancel all sailings unless an agreement is reached immediately with the striking engineers. Should this difficulty exist for any length of time the movement of wood pulp from Sweden to the States would be severely hampered, and would further curtail supplies of foreign sulphite and thereby enhance the value of pulp held unsold on this side.

Quotations hold firm at around 10 cents for foreign bleached sulphite, 8 cents for domestic bleached, 7.50 cents for foreign easy bleaching sulphite, 7 cents for domestic easy bleaching, 5 cents for domestic kraft, 5.50 cents for Scandinavian kraft, and 5.75 cents for news grade sulphite.

RAGS—Although paper mills continue to purchase rags in guarded fashion and in comparatively small amounts, they are inquiring more freely than in sometime, which prompts dealers to adopt a stronger attitude relative to prices and offerings with the result that the market displays a steadier tone. Sellers report that they could easily dispose of much larger quantities of rags provided they were willing to accept orders covering future deliveries, but dealers for the most part are refusing to sell on today's prices unless mills agree to accept shipments at once, which situation reflects the belief of the average packer that values are due for an advance. No important change has developed in quotations. New No. 1 white shirt cuttings are priced at around 20 cents a pound f.o.b. shipping point., washables at 8 to 8.50 cents, new white lawns at 18 cents, new unbleached muslins at 16.50 cents, fancy shirt cuttings at 10.50 cents, No. 1 old repacked whites at 9 to 10 cents, third and blues at 3 to 3.25 cents and No. 1 roofing rags at a cent per pound.

PAPER STOCK—A moderate trade is current in old paper stock. Board mills in the New York vicinity have been in the market for larger tonnages of low grades this week and there has been some expansion of demand for certain of the better qualities, and although buying has not been of a scope having much influence on values, prices exhibit a firmer tendency. Newspapers



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are selling fairly freely to mills at between 60 and 70 cents per 100 pounds f.o.b. New York, and No. 1 mixed papers are bringing 35 to 40 cents a hundred. White blank news cuttings find a ready sale at 3 to 3.25 cents a pound at shipping points, and heavy No. 1 book stock is in better demand at a quotable basis of around 1.50 cents. Shavings continue to be mainly neglected and offerings by packers at 5.50 cents a pound for No. 1 hard white and 4.50 cents for No. 1 soft white shavings meet with little worthwhile response, while colored shavings have sold down to 1.50 cents per pound. Most dealers believe that a little livelier demand would be productive of a rise in prices, and are consequently careful about making commitments involving forward deliveries.

OLD ROPE AND BAGGING.—There is but a slight demand for either old rope or bagging and prices are largely nominal. No. 1 manila rope is available to mills at 4.50 cents a pound at shipping points, and No. 1 scrap bagging at 2 cents, and the probabilities favor buyers getting some supply at lower figures.

News from Our Advertisers

The Cleveland Stone Company.

The Cleveland Stone Company of Cleveland, Ohio, who are represented in Canada by Bouffard-Bergevin, New Birks Building. Montreal, P.Q., have just opened a quarry in West Virginia, to produce pulp stones under their brand "Ironsides."

The manufacture of pulp stones is not a new venture with this company. They produced a high grade pulp stone, one of the first produced in the United States from the year 1892 until 1906 when the "Ironsides" grit was exhausted. They have been searching since that time for a stone which they could consider worthy to bear the brand "Ironsides" and they are satisfied they have it now.

This stone has been subjected to every laboratory test known, with flattering results, and while they realize that the only positive test is the actual use in a pulp grinder, still, their long experience in the grindstone business generally justifies their belief that they have one of the best pulp stone grits produced on this continent or abroad.

They say the "Ironsides" grit more nearly resembles the English stone in all its characteristics than any other American stone. It has that peculiar toughness and hard grain cemented together by an open, medium soft matrix necessary for pulp grinding.

The Cleveland Stone Company have already begun quarrying and are now producing pulp stone rock. This quarry is well southward and is not effected by winter weather as much other quarries. They have four different grits in the quarry varying in texture and hardness enabling them to furnish stone suitable to grind the different grades of pulp required.

The Hall Machinery Company with offices in the Birks Building, 14 Phillips Square, Montreal, and at Sherbrooke, Que., handle a complete line of Pulp Mill equipment from the Slasher to the screens, including also conveyor, boilers, digesters, diffusers and tanks of all kinds.

Mr. Hall was formerly with the Jenckes Machine Company, and has had many years experience with the Pulp Machinery.

The Company represent in Eastern Canada, "The Engineering & Machine Works of Canada, Ltd.," St. Catharines, Ont., who manufacture the well known Tidmarsh line of Pulp Mill Machinery.

Lagerloef Trading Company, Inc., 18 East 41st Street. New York City, have issued an exceptionally attractive leather calendar and desk pad which they are sending to their friends in the trade. The fact that each recipient's name is stamped on the pad in gold gives this New Year's remembrance a particularly personal touch.

Mr. Paul A. Buss who has been connected with Port Arthur Pulp and Paper Co., Ltd., and Provincial Paper Mills. has joined the staff of Mr. John Corcoran, 510 Dominion Express Bldg., Montreal. Mr. Buss will cover the pulp and paper mills with machinery and supplies.

PROGRESS OF THE PULP AND PAPER INDUSTRY.

Exports of pulp and paper products continue to increase in value even more rapidly than the growing capacity of the mills would lead one to expect. The contract market for newsprint continues extremely strong, and we need not repeat here the considerations already set forth in previous issues, which convince us that it will remain so for a considerable time to come. A feature of the export figures of recent months, which are set forth in detail in the supplement, (See Pulp and Paper, Oct 14) has been the large growth and high price of the exports of chemical pulp, which is mainly employed in the manufacture, not of newsprint, but of high-grade papers. The chemical pulp

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industry is one in which technical skill is as important as the supply of raw materials. The Canadian chemical pulp industry has now expanded in size and improved in organization to a point where it can and does attract the services of the ablest experts of the world. Its products now rank on an equality with those of its oldest and ablest rivals.

The next development in this direction will naturally be the further manufacture of this chemical pulp into high-grade papers; for the situation is closely similar to that of the newsprint industry on this continent, and the American market is, or will shortly be, in the same state of dependence upon this country for high-grade papers as for newsprint. The economic superiority which Canada possesses is due not only to proximity to the American market, but to its possession of an unrivalled combination of pulpwood supplies in great quantity and water powers of ample size and cheap development.

A charter has been granted to Ye Paris Printer Shoppe, Limited, with head office at Paris, Ont., and a capital stock of $40,000 to carry on a general printing and publishing business. Among the incorporators are Chas. C. Nixon, Francis H. Harris, of Toronto.

According to a provincial charter just granted to the United Growers' Packages, Limited, with head office at Niagara-on-the-Lake, the company, among other things is authorized to engage in business as pulp mill owners. The capital stock is $75,000.

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., January 20th, 1921. No. 3

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal,
'Phone Uptown 7773.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

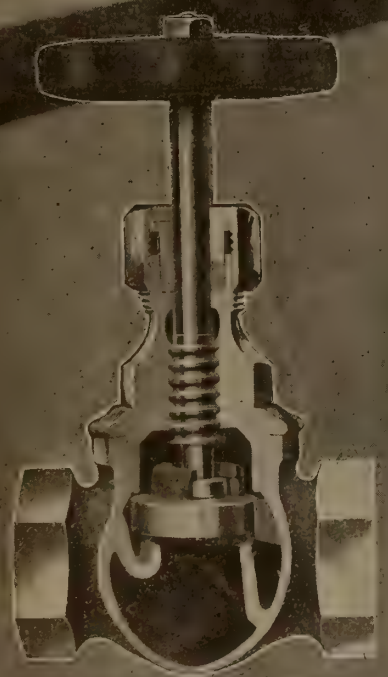
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Changes of advertisements should be in the Publishers' hands ten days before the date of issue.

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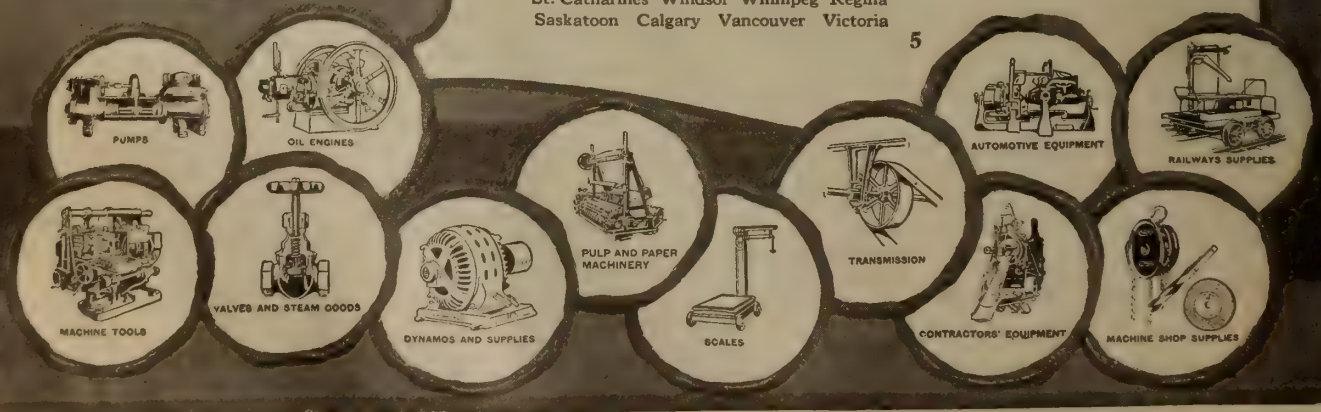
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EDITORIAL

THE SUPERINTENDENTS' ASSOCIATION.

One of the most important recent developments in the Pulp and Paper Industry, is the organisation of the Pulp and Paper Mill Superintendents' Association and the coordination of that association with the American Pulp and Paper Association. There is a distinct field for just such work as can be done by an association of the men who have charge of the actual manufacturing processes in our mills, and nothing is more conducive to the progress of the industry than to provide opportunities for these men to sit down together and discuss subjects of common interest. Because one man gives another his ideas regarding some feature of the business and in return gets his neighbor's method of carrying out some other part of the process, does not by any means indicate that the two mills where these men work will be conducted along identical lines or that their costs of manufacture or the qualities of their finished product will for that reason be identical. These points have been remarkably well expressed in the temporary chairman's address on the occasion of the organisation of the Eastern Canadian Superintendents which appears in this issue. Mr. Argy has not only laid at rest the principal objections that have been raised to such an organisation, but has clearly shown the great advantage that can result from such opportunities for superintendents to confer together.

One of the most striking features of Mr. Argy's remarks is the emphasis which he lays on the function of the superintendent in being the connecting link, or perhaps better, the interpreter between the management and the men. It will be a sad day for the industry if this ever ceases to be so. The superintendent must of necessity be familiar with all of the manufacturing processes, usually by having himself performed most of the operations in the mill. He is thus able to direct the mill work most effectively and as he has served his time in overalls, is perfectly familiar with the severity and hazard and working conditions at every stage in the process and is thoroughly familiar with the attitude of the workmen because he has seen every part of the mill through the workman's eyes. Perhaps early in his overall days he has held a somewhat cynical or perhaps even antagonistic attitude towards the men who had by hard work and self-denial accumulated sufficient capital to establish the mill which provided him an opportunity to work. As superintendent he comes closely in contact with these men and discovers how really human they are and that they have the welfare and prosperity of all their employees very much at heart. He is able to carry to the workmen something of the atmosphere and attitude of goodwill which prevails at the office end, and consequently, as Mr. Argy has stated, the superintendent is one of the three legs which, equally with labor and capital, support the stool of industry.

Lack of space in this issue unfortunately prevents printing at this time, all the excellent papers that were read at the superintendents' meeting. Our best wishes are extended to them for the success of their organization and may their tribe increase.

GOD'S WORK.

In the Pulp and Paper Magazine for January 6 we made an appeal for gifts to help keep from starving a few of those in famine stricken Europe and China who will surely die unless we help them. It is a pleasure to acknowledge an immediate response from Mr. O. W. Hovey of Fraser, Brace, Ltd. His check has been transmitted to headquarters. Most of our pulp and paper companies are constantly giving generously, as are many individuals in the industry, to such worthy causes as this.

We have omitted mention of the heart-melting pictures of pitiful want that urge us to speak of this opportunity to prove the Christianity of Canada, but we know that there is not a man among our friends in this industry, who could watch a small boy trying to crack a bone that he might ravenously lick out the bit of marrow and not gladly give the $10 that would keep life in that little body till the next harvest.

COBWEBS.

The Paper Makers' Journal is again urging the establishment of an association of manufacturers and workers in the Pulp and Paper Industry for providing out-of-work insurance, death benefit insurance, and an unemployment bureau. Such a movement must assuredly deserves success. We stand ready to help.

Canadian Santa Claus Fairbanks-Morse has been round again. This time the remembrance is a penknife with stainless steel blades, a feature that will be appreciated at those times when we don't have time for breakfast before leaving for Montreal and grab an orange to eat on the train.

Out of gas.

Superintendent is the Keystone of the Industry

In opening the meeting M. J.Argy, of the Cliff Paper Co., Niagara Falls, N.Y., our temporary chairman, said:

We are assembled here today to inaugurate the first Canadian Division, to be known as the Ontario Division of the American Pulp and Paper Mill Superintendents' Association. While a meeting of this character has been contemplated for some time by our National Association officers, circumstances over which they had no control, have prevented them from complying to the numerous requests of the Canadian membership for a division on this side of the border.

Our National officers are serving without salary and as they are all Superintendents of large enterprises, you can readily realize that it is not possible for them to leave their work at too frequent intervals. In order, therefore, that this meeting should not be delayed any longer, our worthy president, Mr. Boyce and the Executive Committee, after having consulted the Canadian members who were present at the Chicago convention, decided upon this date for the meeting and he appointed a Committee to make the necessary arrangements and bring to realization the wishes of the Canadian superintendents.

I have the honor of being appointed Temporary Chairman and represent the Executive Committee at this meeting and I will endeavor to fulfill the duties to the best of my knowledge and ability.

Now in regard to the Superintendents' Association, I do not know how I could possibly explain its ideals and what it stands for in as good or as clear a manner as does the emblem on the cover of the book you have in your hands, which typifies the Superintendent as the keystone of the arch of industry; the connecting link between management and production, between capital and labor and supported upon the foundation of confidence. Here you have in a very concise form the ideal for which our Association stands—to develop its members so that each individual Superintendent may be a fitting keystone to the industrial arch of the Company by whom he is employed.

The Superintendents' Association idea is not a new fad by any means. It has been tried for many years and in many countries and has proven itself of great assistance to the industries that have adopted it.

The first organization of this character in America, was instituted by that canny Scotchman Andrew Carnegie, who organized all his Superintendents into a club or association. Several weeks after this Association had been perfected and upon his suggestion, a trip was taken by this body, to the heights overlooking the Pittsburgh manufacturing district. After they had reached the summit and had had sufficient time to visualize the wonderful industrial empire that stretched before them, a sight which many of you are well acquainted with, he turned to them and said "Here before you is spread the greatest basic industry in the world and each and everyone of you is an integral part of this industry. This is all yours if you wish it. Yes, you can be more powerful than all the crowned heads of Europe and all you need to accomplish this is to have confidence—confidence in your industry, in your Association and in one another."

Gentlemen, to paraphrase our dear old friend Andy, I may truthfully say that the third greatest basic industry lies before you and it is yours if you wish it—if you have the confidence that it is a great industry—confidence in your Association and confidence in one another.

A Superintendents' Association in our own particular industry has long been talked of but owing to the numerous duties, the isolated position in which the majority of the Superintendents have been placed and the small amount of leisure time at their disposal its earlier materialization has been prevented, but the propaganda of a Superintendents' Association which was spread by such men as Bill Fogarty and Fred Boyce did not fall on barren ground, so that when finally the opportunity was offered at Appleton, Wis., in June of 1919, the idea of an American Pulp and Paper Mill Superintendents' Association, that had been in the air for so many years, was given an opportunity to crystalize and this crystal has been growing almost miraculously ever since, until now it is one of the principal jewels in that crown of the paper industry—The American Paper and Pulp Association. Since that first meeting we have developed from twelve Superintendents to an Association having five Divisions and three hundred members and all this was accomplished in the short space of one year and six months. You can, therefore, realize that the Association has fulfilled a need in our industry and just so long as we follow the policies laid out by the Executive Committee up to the present time, endeavor to do the greatest good for the greatest number, there is nothing that can prevent us from being even more successful.

The programs at our various divisional meetings are on a smaller scale but identical with the conventions held by the National Association and consist of papers and addresses by members of some of our standing committees and the best authorities we can obtain on subjects that are of lively interest to all pulp and paper mill superintendents.

These meetings will not make a paper maker of the layman, nor of the man who knows little or nothing about his own industry and endeavors to keep that to himself; but to the superintendents who are paper makers, there is no doubt but that they are made better paper makers by attending our meetings. If you are thinking of joining the Association with the one idea in view of getting all you can out of it and giving nothing, your are sadly mistaken, as under no conditions can you get something for nothing. You will get out of this Association just what you put into it and it is by this mutual exchange of knowledge that the Association has been enabled to make the wonderful progress it has.

One of the subjects that we have had presented to us at several of our meetings in the past and which I am pleased to note is on the program for this afternoon, is "Industrial Relations." While this is not a technical paper making subject, it is one of the most important questions that could be discussed by men who are directing the efforts of thousands of workers. You indeed are the keystone of the industrial arch. Upon one hand you have capital, which is placed in your hands by the officers of the company that you represent. You have the disbursement of this capital and must, if you are to be successful in your chosen field,

show a profit upon the capital expended by you. On the other hands you have labor. You must make this labor productive and earn dividends for your company; at the same time see that they are given their just share and sell them the idea that they are not working for the company but "with it." You indeed hold responsible positions, not only with your industry but with society at large, especially during this period of readjustment, when the smallest spark may set all civilization back a hundred years.

The time for the Czar and autocrat in industrial affairs is past. It is the man who can direct big business and at the same time take into consideration that the most menial worker in his organization is a human being, who is the real leader in industry to-day. There are bound to arise differences of opinion between yourselves and the men whom you employ and if you bear in mind, when a situation of this kind confronts you, that the other fellow is also human and that none of us are infallible, you will get together with your men and discuss with them the points at issue, — not through any intermediary or third person of any kind, but get together with the men themselves. Put your feet under the same table with them and you will be surprised how quickly the differences will disappear.

Industry is well represented by the three-legged stool — with Capital, Labor and the Superintendent representing the three legs, and the whole is no stronger than the weakest of the three. If each one of these three divisions are held firmly together by the strong bond of common interest, there is no doubt but what the industrial organization represented will be very sturdy.

On the subject of Industrial Relations, the Superintendents' Association is of particular value to the Superintendents. It gives you an opportunity to get together and know that the Superintendents of other mills are common ordinary fellows like yourself and are not trying to steal all your help and make labor conditions in your locality as unstable as possible by constantly granting some concessions to their help.

At the various divisional meetings this subject is discussed very frankly and thoroughly, and all the rumors of what the other mill was doing, which perhaps was causing your mill to be a hot bed of discontent, are thoroughly discussed.

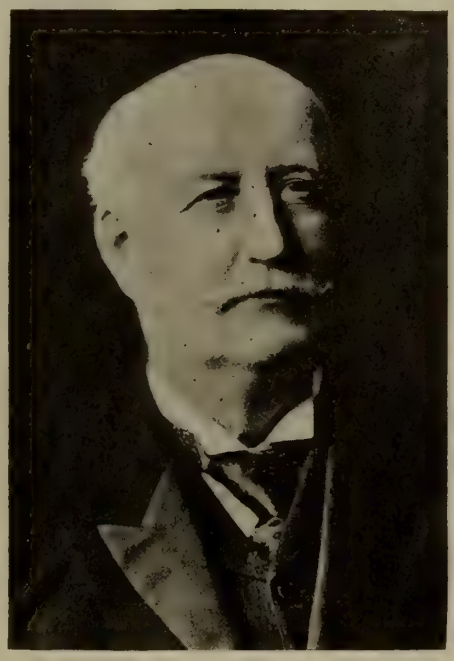
Bill Jones will ask Tom Smith whether it is true, as has been rumored around his mill, that he was going to give machine tenders $5.00 an hour. Tom Smith will ask Bill Jones whether the rumors that he heard at his mill is true that the hours were going to be cut to three and a half a day and two hours for lunch. In this way the Superintendent is given the opportunity to combat any ill rumors that may hurt the morale of his organization and should something of this character arise between meetings, he will consider himself sufficiently acquainted with Bill Jones to call him up on the telephone and ask him if it is true; so you see that the advantage of membership in the Association is not limited to the information you may receive in regard to making better paper cheaper, but will assist you in many other ways and make all of you much more valuable to the company you represent.

Now the success or failure of any organization, while it may be settled on to the shoulders of the officers who are directing its affairs, rests really upon the membership body itself. You are given the opportunity of selecting the officers that are to direct the destinies of the Ontario Division and it is upon your selection of the right calibre of man for the positions of Chairman, Vice-Chairman and Secretary of this Association that will spell its success or failury.

In closing I wish to impress upon you the importance of the selections you are about to make for the officers of this Division and I hope that you will endeavor to make your choice with the one idea in mind that responsibility for the success or failure of the Ontario Division rests individually upon each and everyone of you.

SIR WILLIAM GAGE IS MOURNED.

The death is announced in Toronto of Sir William Gage, well-known as the founder and head of the William Gage Publishing Co., on Spadina Avenue, and for some years prominently associated with social betterment movements. The late Sir William Gage was born in Peel County in 1849 and was educated at Brampton High School and Toronto Normal School. He taught school for several years and in 1874 he entered partnership with Adam Miller & Co. in the publishing business, which later changed to the present firm name of W. G. Gage & Co., of which Sir William



had been president since 1876. He was president of the Educational Book Co., of Toronto; president of the Kinleith Paper Mills, St. Catherines; director of the Imperial Bank and vice-president of the Chartered Trusts & Executors. The deceased was known most widely through his interest in the relief work for consumptives. He was the founder of the King Edward Memorial Fund of one million dollars for consumptives in 1912 and was founder and president of the National Sanitarium Association. Only just recently he personally applied to the city for funds to assist with the rebuilding of the burned Muskoka Hospital. It was in consideration, largely, for his splendid activities along philanthropic lines that he received his knighthood from the King.

The good Lord gave every man so much brains, but the brains that he gave to some people in this world are somewhat like swampy land—it doesn't produce much.

Mill Superintendents Organized at Niagara

Canadian pulp and paper mill superintendents are now organized as part of the American Pulp and Paper Association as a result of an enthusiastic and well-attended meeting held at the Clifton Hotel at Niagara Falls, Ont., on Jan. 8th. It has been originally intended to make the branch an Ontario one but it was generally felt that the ends of the organization would be better served by including the whole of Canada, and allowing the different sections to organize individually if they saw fit, as part of the Canadian section. The new organization therefore comes into existence as the "Eastern Section of the Canadian Division of the American Pulp and Paper Mill Superintendent's Association" and in the meantime it will be all-Canadian as far as membership is concerned. The parent organization is the American Association which is composed of both Canadian and American mill superintendents. It was emphasized in the discussion that there should be no line between Canadian and American members, for, as was pointed out, the parent organization is international in its scope, the American Pulp and Paper Association including in its membership men engaged in the trade on both sides of the international boundary.

The Canadian Division starts out with an efficient and enthusiastic executive. The chairmanship went to William A. Anderson, of the Kinleith Paper Mills,



The Pulp and Paper Mill Superintendents before the camera at Niagara Falls, Ont.

St. Catharines, Ont., and W. E. Ziemann, of the Abitibi Power and Paper Co., Iroquois Falls, was made vice-chairman. The secretary is C. Nelson Gain, of the Don Valley Paper Company, Toronto.

The gathering was presided over at the start by the temporary chairman, M. J. Argy, of the Cliff Paper Company, Niagara Falls, who, in an excellent address outlined the aims and objects and the work to be accomplished through the organization of the Canadian branch. Mr. Argy described the mill superintendents as the keystone of the industrial arch extending between capital and labor and referred to the fact that the first organization of mill superintendents had been formed by the late Andrew Carnegie. Other papers read included on "The Paper Machine—Its History and Future Development" by Stuart D. Lansing, President of the Bagley and Sewall Company, Watertown, N.Y.: "A Plea for Accident Prevention" by A. P. Costigane, Secretary of the Ontario Pulp and Paper Makers' Safety Association and "Drying Paper: Temperature Control; Fuel Saving" by F. C. Farnsworth, President of the Farnsworth Co. of Canada. In addition there was a brief address by F.W. Monaghan, of the Bagley & Sewall Co. of Watertown, N.Y., who at one time ran a one-thousand-feet-a-minute paper machine at Mosinee, Wis., and who predicted that some time in the future paper would be turned out of the machines at a mile a minute, although it might not be within the lifetime of his hearers.

A pleasant and enjoyable feature of the gathering was a banquet on Saturday night which was presided over by Chairman Anderson, with Mayor Battle of Thorold as toastmaster. Brief addresses were given by a number of the mill superintendents, with orchestral and vocal music in between.

Among those present at the meeting were the following:

J. J. Herb, Interlake Tissue Mills, Merritton, Ont.
G. Bradley, Alexander McArthur & Co., Montreal, Can.
W. A. Anderson, Kinleith Paper Mills, St. Catharine, Ont.
George K. Walker, Finch Pryne & Co., Glenns Falls, N. Y.
Edward Simonson, Buffalo.
S. Byrne, Riordon Co. Ltd., Merritton, Ont.
E. D. Burgess, Garden City Paper Mills, St. Catharines, Ont.
M. J. Argy, Cliff Paper Co., Nigara Falls, N.Y.
Dan Daverin, Provincial Paper Mills Ltd, Thorold, Ont.
Alexander Beique, Canada Paper Co., Windsor Mills.
Frank McHenry, Belgo & Pulp & Paper Co., Shawinigan Falls, Que.
William White, Fairbanks Morse Co., Montreal, Can.
G. J. Armbruster, Lincoln Paper Mills, Merritton, Ont.
W. H. Brydgess, Defiance Paper Co., Niagara Falls, N. Y.
Fred J. Rooney, Upson Co. Board Mills, Lockport, N. Y.
L. N. McIntyre, McIntyre Brothers Paper Co., Fayetteville, N. Y.
F. C. Farnsworth, President, Canadian Farnsworth Co., Toronto.
C. Nelson Gain, Don Valley Paper Mills, Limited, Toronto.
A. P. Costigane, Secretary, Ontario Pulp and Paper Makers Safety Association, Toronto.
F. W. Monaghan, Bagley and Sewall Co., Watertown, N. Y.
Steward D. Lansing, Bagley & Sewall, Watertown, N. Y.
W. E. Ziemann, Abitibi Power and Paper Co., Iroquois Falls, ~~N. Y.~~ Ont
John F. Kilawee, Ontario Paper Co., Thorold
William H. Rose, agent Farnsworth Co., Toronto.
W. E. Pickard, Hammermill Paper Co., Erie, Pa.
J. A. Bowers, Hammermill Paper Co., Erie, Pa.
Carl G. Thurman, New Hartford.
K. S. MacLachlan, Lincoln Paper Mills Co., Ltd., Merritton, Ont.
J. G. Dunn, Ontario Paper Co., Thorold, Ont.

I may truthfully say that we ...

WHAT DEMURRAGE COSTS.

Over 71,000 days of Demurrage Were Charged on Freight Cars in Canada in the Month of June last Year.

This means 71,000 car-days wasted over and above the usual 3 days free time allowance for loading, unloading, and clearing the Customs.

The sum paid by shippers for this demurrage was $186,791—or say $2,000,000 a year!

This is only a Fraction of the Loss Involved!

There are in Canada about 200,000 freight cars available for 30 days per month, or, in railway parlance, 6,000,000 car days. Approximately 71,000 of these are accounted for by the above-mentioned delays, or say 1.1 p.c. of the month's freight carrying capacity of the Canadian railways.

While these delays do not occur simultaneously, the effect in the end is as expensive as would be the total cessation of freight loading in Canada for a period of, say, four days each year.

Conversely, if such delays did not occur (and most of them not occur), the railways would be in a position to move theoretically about 1,300,000 additional tons during the year.

Watch your demurrage bills, see that your Head Shipper trims them to the lowest point, and if possible release your cars even a whole day before the margin of the free time has expired.

Sometimes it does apparently pay you to pay demurrage. By waiting a few days you may be able to use your own trucking facilities at a time when they would otherwise be idle. It is quite true you do not desire to get your truck driver into the habit of thinking that outside help may be called in whenever there is rush of work.

But may we suggest other considerations that should come into effect?

Your delay is contributing to a car shortage that may come back against **you** next week or next month!

The car you hold out of service to-day may be the car someone desperately needs—or that you yourself may be eager to obtain next week or next month!

Demurrage bills **never** pay.

Not only is this true, but it will be a sign of high public spirit on your part if, in addition to cutting out demurrage, you will **actually unload your cars before the limit of free time has expired.**

You have now practically three days' free time, including 24 hours allowed for Customs purposes.*

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* So acute is the car situation, especially in regard to coal, that the Department of Customs has arranged to release incoming cars of coal so that you may begin unloading them before entries are passed, provided only that you file the necessary papers with the local Customs officer. Thus in case of coal delays in the Customs should be eliminated.

Will you not co-operate by releasing your cars if possible within the first 24 hours after receiving them? Do not use the full limit of free time if you can help it.

You will be assisting the railways to give you good service and you will be saving actual money to yourself if you put your best "watch-dog" on your demurrage bills and if you urge your Head Shipper along the lines just indicated.

To watch your demurrage bills will require only half an hour or an hour's time once a month! But it will remind your staff that nothing is overlooked by your Management.

MORE POWER AT PORT ARTHUR.

The photograph depicts Mr. Brackinreid, as Mephistopheles, representing Hydro Electric Power, presenting "Optimism," Miss McTeigue, at Port Arthur Ont., part of a clever playlet portraying the electrocution of Pessimism and birth of Optimism in connection with celebrating, on New Years' Day, the turning on of Hydro Electric Power from the Development in the Nipigon which makes available for Port Arthur, a large surplus of electrical energy to take care of her fast growing requirements industrially, among which are several pulp and paper enterprises, 72,000 h.p. a portion of the 300,000 h.p. possible of development, becomes available by this enterprise. The power was turned on December 20th. On New Years' Day Port Arthur duly celebrated this event with the Carnival and Masquerade, the whole show ending with the playlet "Death of Pessimism and Birth of Optimism."



Announcement was made during the celebration of the proposed expansion of the Provincial Paper Co. Ltd., doubling their present pulp output and adding paper manufacturing, also the successful conclusion of the plans of the Shuniah Pulp & Paper Co. Ltd., a 100 ton pulp proposition, and the proposed expansion of the Kaministiqua Pulp and Paper Co. Ltd., to 100 tons, expansions which will employ an additional 1000 men in Port Arthur's industrial life.

1921 surely ushered in bright prospects for Port Arthur, Ontario.

Mr. James Logie, Front Street, W. the popular Toronto representative of the Canada Paperboard Company, Limited, has had the principal points in Ontario added to his territory and will cover the trade in the district at frequent intervals.

HEAVY CHEMICALS, CANADIAN MARKET,

Toronto, Jan. 15, 1921.

Soda Ash.—Small lots 3-3½ cents ex store, 2.8 cents car load lots, Amherstburg. The price has been set for this year and the market is becoming quite firm.

Sulphuric Acid.—Market quite unsettled. $22.00 per ton ex works is quoted today.

Alum,English.—Steady. $4.40 per 100 cwt, Toronto and Montreal in small lots.

Salk Cake, Muriatic and Bleaching powder.—Market rather unsettled ,tendency to slight over production. Salt cake is quite weak.

PAPER AND FORESTS.

The paper problem of the United States is primarily a forest problem.

The paper industry of the United States is now concentrated largely in the coniferous forest belts of the Great Lakes, the northern Alleghenies, New York, and New England. Twelve years ago these forests furnished all of the raw material for the industry. Year by year, as they have been depleted, the adjacent timber belts of Canada have been drawn upon until now a full third of our paper or paper-making materials comes from the Dominion. The pulp woods left in the Northern and Eastern States can not last, under the present rate of cutting, more than 15 or 18 years. The spruce forests of Canada will continue to furnish pulpwoods for a longer period but in their turn are no less exhaustible. Meantime our consumption of paper is steadily increasing and now exceeds 35 pounds per year for every man, woman, and child in the country.

Paper Shortage World-Wide.

The rest of the world is in the same situation. Nearly everywhere the progress of civilization has been marked by an increased per capital consumption of paper; and nearly everywhere paper is short. From far-off Australia, from China, from Japan, and from South America are coming demands upon the paper-making resources of the North American continent. Large publishing houses of England are acquiring pulp factories and forests on this side of the Atlantic. Confronted by a world hungry for paper the United States will indeed find a foreign source of supply a broken reed upon which to lean.

What, then, is the answer? The New England and Middle Atlantic States contain 31 million acres of heavily culled or logged-off lands. The Lake States contain 33 million acres of logged-off forest. Here are 64 million acres of timber-growing land within a stone's throw of our paper mills, land which could supply these mills several times over with pulpwood if they were but kept at work growing it. In the application of forestry to these enormous areas, much of which are now practically waste land, lies the only effective solution of the national paper problem in the future, as well as the problems arising from shortages of other essential forest products. There is no situation that emphasizes more clearly the need for a national forestry policy, enlisting the owner of the land and the public alike in the restoration of these areas to producing forests.

Western Resources Should Be Drawn Upon.

There will be a gap, of course, between the end of the old forest crop and the beginning of the new. To fill that gap and at the same time distribute our paper industry in a much more logical relation to the resources of the country as a whole, we must turn to the paper-making woods of the West. The Western States contain easily 400 million cords of paper-making woods, and southern Alaska contains another 100 million cords. With 5-cent newsprint in our principal paper markets there is no fundamental reason why these western resources should be drawn upon for a national supply as well as the local requirements of their own States.

While the pulpwood forests of the West offer an immediate opportunity to increase the production of paper on American soil and will contribute largely to our future supply, it is undesirable from every standpoint that the paper industry should eat itself out of existence in the Eastern and Northern States. And there is no reason why a large paper industry in our eastern forest regions should not be permanent, supported by raw material produced wholly within our own borders. All that is required is the intelligent use of land for the production of timber when not suited by its nature to more valuable products.

Regulation of price, control of distribution, restraint upon profiteering, however necessary as temporary expedients, will not solve the paper problem. There is but one effective solution—increased production of paper and continuous crops of the raw material whereof it is made. Our need for paper to-day is simply one concrete measure of our need for a national forestry policy.

HOLD ON!

Those who invested their earnings in luxuries during the past two years will now find themselves without any money in the bank, and in thousands of instances without a job. One labor leader started a factory to make silk shirts and neckties for laboring men, and the doors of his mill are now closed. Those men who turned their chicken yards and gardens into garages will now wish that they had had a little more foresight. "More than 1,000 employees of the Inland Steel Company, Indiana Harbor, have been laid off for lack of orders." "The employees of Anawan Mills, waste manufacturers, and of the Erco Company Spinning Mills, Fall River, Mass., have agreed to accept 15 per cent. and 20 per cent. reduction in wages respectively in order to keep the plants in operation." "At a meeting of Georgia, Fla., Sawmills Association, comprising the biggest operators in two states, it was decided to cut wage for common labor in the mills to $2.50 per day and proportionately, beginning November 8th."

During the past six years there has been an army of men who have travelled from one end of the continent to the other, working in this mill and that for short periods of time, saving up enough money to go to another mill. Thousands of men today are out of employment in Montreal and Toronto. Money is tight. It is almost impossible to secure it except at very high rates in a great many instances. The time has arrived when a man who has been a steady employee in any company over a period of years can look with more or less pride upon the fact that he has remained a steady man when the temptation was present to flit about. A man who has a job today will do well to hold on to it. It looks as though is would not be very long before there will be more than one man for every job. We have in the Spanish River Company 400 men who have worked for the Spanish River Company between five and ten years. Five years from now we should have twice that number. Long and steady service is valuable to the man and to the company. Hold on to your job.

Thus saith the Spanish River News. Better advice could not be given at any time. The world has too many drifters.

The next event to look forward to will be the annual meeting of the American Paper and Pulp Association in New York. Let's see if the Gothamites can beat Montreal for a paper convention work.

Speed Inter-Lock as Applied to the Paper Machine*

By F. G. WARBURTON, Harland Engineering Co.

In regard to the time considered desirable for reading a paper before the Technical section of the Canadian Pulp and Paper Association, I have confined my remarks, as far as possible, to mechanical considerations and the general effect of same on the production of paper, referring as briefly as possible to allied subjects such as thermo-dynamic mill efficiency, which fascinating subject alone could easily take up the whole of the time available.

Almost every paper machine in the world today has some form of belt, or rope and belt drive. Over a considerable number of years in various countries attempts have been made to drive paper machines sectionally by individual electric motors. In the past the result has been the same in each country, generally a pitiful failure, sometimes after really heroic struggles, to save the drive. Why this desire for some other form of driving? What has impelled men in the past all over the world to depart from accepted practice in the driving arrangements of the paper machine? Not, I think, simply the desire of change, that does not square with human psychology; was it not because they realised at least some of the imperfections of usual drives, dirt, danger, power consumption, stoppage, maintenance, etc.? I suppose, having motors in the rest of the mill, they realized the great advantages of individual motor drives. Whatever may have been the prime reason in each particular case, collectively there is no doubt that the desire for change reflected dissatisfaction with drives existing, but, unhappily for manufacturers and for the industry, in the state of the art as it then was, they were indeed "Out of the frying pan into the fire." They had not their troubles to seek.

I sometimes wonder where the ignorance lay. Was it a lack of knowledge of the accuracy of speed regulation required as between the sections; or, was it a disregard of the inherent characteristics of motors on the part of those responsible for such installations? In practice, the performance of the paper machine with uncontrolled motors was worse than with belts, and no wonder; the marvel is that such installations allowed paper to be produced at all. In brief, a variable speed motor "uncontrolled," can, between full and no load, have a speed characteristic as much as 50% bad. I will show later how such a motor, or collection of motors, controlled by the "Inter-lock" are made to act as though they had speed characteristics 100% perfect. Before doing so, however, I wish to analyse present driving arrangements, in other words, mechanical drives in which at last one belt is used per section. Various names are given to such drives, e.g., "Marshall," some have no names,—perhaps just as well!

The drawings of a modern 166" paper machine by a well-known builder, so modern that the machine is still being built, showed five links of transmission between the couch and press rolls and the prime mover, each comprising one rope, three belt, and one gear connections, the other sections had less links.

Let us consider the action of a single belt under working conditions. For the moment we will consider only flat pulleys, or pulleys having a slight crown. Later, we will consider the special case of cone pulleys. Power is transmitted by a belt due to tension difference between the two sides of the belt. When at rest, with no torque or resistance to torque, the tensions on each length of the belt are equal, but directly the driving pulley commences to exert torque the tensions on the top and bottom sides of the belt are no longer equal, and, as soon as the difference in tensions becomes great enough to overcome the resisting torque, motion commences. When running, all other things being equal, the amount of power transmitted by a belt is directly proportional to the difference of tensions.

Which of us, having a prime mover with a pulley 24" diameter, running at 500 revs. and a driven shaft that we desire should run at 500 revs. would put on the driven shaft a 24" inch diameter pulley? Some of us, perhaps, in our early days tried. Those who did, found, as I did, in my early days on the test-bed, that it cannot be done. We got into the habit of allowing that the driven pulley should be a few per cent smaller in diameter than the driver as compared with the arithmetical ratio of diameters and speeds.

Why is this necessary? Where the difference? The difference is made up of two factors, stretch and slip. A belt, like all other materials, has a coefficient of elasticity, and with every strain there is a relative elongation, and the greater the strain the greater the elongation. As seen above the strain on one side of the belt is greater than on the other side of the belt when driving is taking place, and so one pulley is receiving a greater length of belt than is being received by the other pulley. To compensate for this the driven pulley runs slower. This factor may be described as stretch or creep. There is still another factor which causes the driven pulley to run still slower than if only creep came into consideration—"Slip."

Now the other factor, "Slip." I apologise for bringing authorities to bear on the slip factor. My justification is that I have been told several times by well-known men, some engineers, that there is no such thing as belt slip, but only creep, that there would seem to be the need.

Unwin "Elements of Machine Design" (1919 edition), says:—"The earlier writers assumed that there was no slipping of the belt on the pulley, and that if slipping occurred the belt would cease to drive. So far is this from being the case that there is always some slip of the belt."

Again, "A belt is not used in cases where a very exact velocity ratio is necessary."

Lewis, Tran. Soc. M. Engrs., Vol. VII. "The usual slip in driving may be 1% each pulley, i.e., 2% altogether. At 10% usually the belt throws off."

Imagine 10% stretch!

Professor Lanza. (Trans. Am. Soc. Mech. Engrs. VII 374) shows that the coefficient of friction itself between the belt and the pulley depends on the amount of slip, and that whereas with a 1% slip on a pulley the coefficient of friction was ·33, at a slip of 14% the coefficient had risen to ·82.

Professor Sawdon, M.M.E., of Cornell University, is the only other authority that I will quote. Some of you may have read Prof. Sawdon's paper en-

*Paper read at the Annual Meeting of the Technical Section of the Canadian Pulp and Paper Association, Montreal, Jan. 19 and 20, 1920.

titled "Test of the Transmitting Capacities of Different Pulleys in Leather Belt Drives," read before the National Association of Cotton Manufacturers, Sept. 29, 1911. Prof. Sawdon claims that the eleven months of testing at Sibley College, Cornell University, are perhaps the most thorough tests ever taken on belt slip and creep. No less than eleven months of steady testing, during which 9,000 observations were taken on a machine especially constructed to measure slip and creep, etc.

He says, "By taking continuous observations of slip over long intervals of time, with the machine running under constant conditions of tension, brake load and speed, data was collected and curves plotted between per cent of slip and time. Those on Figure 3 are typical."

("Figure 3" was shown as a slide).

Most of us, I fancy, would expect over a period of thirty minutes, that with a constant load, slip and stretch would be nearly constant. Look at the curves, the load a pony brake, no workshop conditions, no mess, no oil around, no steam, and yet we see, that with a dead load, the slip varies over a period of 30 minutes between ·5 and 15% on the top curve, and on the bottom curve between 1% and over 10%. Our authority says that these are perfectly typical curves. "From these it would be seen that the slip is continually varying. By comparing a large number of such curves, it was found that this variation takes place through no clearly defined cycle." Had the belt speed during test been high, one might have suggested air pockets, but the conditions of test prevent any such thought; the belt speed over all tests was low, 2,200 F. P. M.

Let us now look at a condition of load variation. On page 19 of this pamphlet we find, reduced to figures, the average of eleven months' work. Let us take one class only on account of time, a load increase of 20%. The belt is supposed to be normally loaded after the 20% increase, i.e., ratio T/t 3·57, a very normal figure. The slip has changed from 2·26 to 3·29%, i.e., more than 1% change.

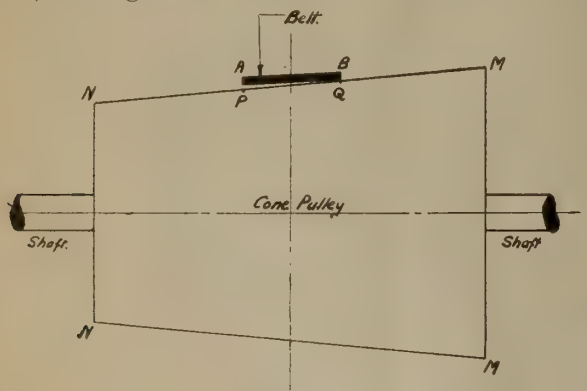


Fig. 1.

Now let us consider the condition above on the paper machine itself. The sectional draw is set at less than 1%, perhaps at ·5· A 20% change of load takes place, such as is caused by the addition of weights or increase of bearing friction, we find that the slip has changed on the section 1%. But the draw was only at the most 1%; therefore, the draw has changed 100%. If we used ·5 figure for draw, the change of draw would of course be 200%.

We have all seen this in practice. Many have smoothed out this annoyance by altering the draw handwheels along the whole machine until this undesired draw was stroked out. Consideration of the Sawdon curves clearly shows that even a change of load is not necessary to alter the speed relationship between sections, but the peculiarities of belt performance will do all this without load change at all. All the more credit to the operators, who by skill of eye and hand, beat out such belt transmission peculiarities.

Just a moment, on Cone Pulleys. The pulley shown in Fig. 1 is the driven pulley. The smaller diameter is NN, the larger MM. The belt AB and the points of extreme contact P Q. Now points NPQM are all making the same revolutions per minute, but point M is making a greater peripheral speed than N, and in like manner Q a greater speed than P. But the point of the belt A is making the same linear speed as the belt point B. Now we know that normally the intensity of contact at BQ is greater than at AP. Suppose that the centre of driving force of the belt is located at the point BQ, then the slip at AP must be very great. On the other hand, suppose that the centre of driving is towards A, but nearer to B, then we find that the point of the pulley most closely in contact with the belt viz. Q is running faster than the belt, and that the pulley at Q, so closely in contact, is actually trying to drive the belt, although this is the driven pulley we are considering. Look at "cone pulleys;" see the point "Q" bright, and a little way down a dull portion, and then again bright and then again dull. A battle of friction, positive and negative, not very efficient! a method of giving constant draw! it is used as such. When discussing flat pulley drives once with a paper maker, I was told "the best paper is made on machines with flat pulleys" on the face of which paper is stuck. Is there any wonder?



Fig. 2.

Since writing the above, I have been fortunate in obtaining a photograph of a new cone pulley where the battle of frictions had not had time to wear out the tool marks all over the pulley, the draw at that time had not been changed, and so we can see all the bright and dull spots as discussed above in a most illuminating fashion. The pulley shown in Fig. 2 is the reel pulley on No. 8 Laurentide Machine, the time of running only a matter of days to run in the bearings, load light, the initial tension that usually put in by mill mechanics—rather severe! Could a tale be more clearly told than this picture tells?

Let me say also that I was able to push a 15/1000 feeler a considerable way in between the belt and the pulley at the small diameter end of the pulley, in spite of the high initial tension.

It is quite easy to make both edges of the belt grip the pulley with almost equal intensity by setting the pulleys out of alignment as referred to a line at right angles to the two shafts and running though the centre of each pulley, both shafts still being parallel to each other. Let us call this a positive direction of staggering the pulleys; what do we find in practice? The staggering is done in just the opposite direction, and instead of bringing each edge of the belt into closer contact with each pulley, actually an attempt would appear to be made to accentuate the gap on the narrow end of each pulley, evidently it has been found that the battle of forces is too great even when the pulleys are set in a normal fashion without staggering, for all over the world cone pulleys are so staggered in a way to make the belt free at the narrow diameter of the pulley.

It is clear that power is transmitted to the belt by the driving pulley near one edge and that power is taken out by the driven pulley from near the other edge of the belt, an interesting way of transmitting power and one which the belt objects to as indicated by the way the fasteners or laces more rapidly tear out at each edge of the belt than at the centre.

Another thing which is quite clear from our picture, which is well known in practice, is that one cannot indefinitely widen a belt on a cone pulley, because the wider the belt the more fierce the battle of forces, the lower the efficiency of drive, and the shorter the life of the belt.

Individual driving of paper machines has shown how inefficient the transmission of power by cone pulleys can be.

I suppose no one will disagree that, other things being equal, the machine that has the most perfect speed control as a whole, and particularly the most perfect Inter-Speed control will produce the best paper. A paper-mill owner in Scotland a few years ago told me, that, by taking out the engine which previously drove the variable speed end of his paper machine, and replacing same by an electric motor, he was able to produce, on the same machine, paper to a 15% keener whole machine. Today it is possible for the paper maker to have perfect speed harmony as well in beduce, on the same machine, paper to a 15% keener specification than ever he was able to do before. He had all the belts as before, but a motor in the place of the engine; the governing was better, that's all, for the whole machine. Today it is impossible for the paper tween sections where it counts most in the product produced and in the cost of production.

For the first time in the history of paper making, the paper machine may now be a positive instrument in the hands of the operator. Such a machine has been in operation since the early days of the war with Inter-lock control, some six years of continuous operation. The machine may almost be described as a jobbing machine; its usual service is to run a few hours on one class of paper and then to change over to another class of paper and speed. The speed variation for running conditions is on that machine, 10 to 1. The machine was one of the type mentioned early in the paper with a sectional drive, which had given so much trouble that the management were on the point of throwing it out. The motors were in many ways unsuitable for Inter-lock control. But, in spite of that the machine with Inter-lock control is running today and has been producing paper throughout the war.

Your Council have asked me to describe to you the Inter-lock particularly as installed in connection with new Laurentide machines, and I wish to thank the management thereof for their permission to do so.

In a short paper it is impossible to cover the whole subject of sectional motor driving of paper machines. I will need be content with covering some of the major considerations of the Inter-lock, but I most earnestly ask any members present at the close of the paper to put forward questions, and I will do my best to answer them.

Each section has its own motor. The drive may be through any form of gearing, or the motor may be direct—coupled to the section. In the case of slow speed machines there is no doubt that some form of gear box is the best, be it worm or of the herringbone type. For high speed machines, to direct-couple is probably the best on account of space considerations; on account of efficiency there is nothing to choose. The slow speed motor has an efficiency about the same as the combined efficiency of the higher speed motor and the gear box if of the herringbone type; a combination of both systems is used at Grand 'Mere.

The motors and interlocking regulators are of the totally enclosed type with forced ventilation and all motors and regulators being in the machine room, this arrangement protects the plant against hose displays at the wet end! and against the high temperature air conditions around the dryers, and as filtered air is used, the motors are kept clean. A nice arrangement sometimes possible in the case of a new mill is to build an annex for all the electrical equipment, to keep this clean and dry, and to allow the driving in shafts to pass through a wall of the annex to the machine room. (Lantern slide).

The motors at Laurentide are shunt or compound wound direct current motors, fed from common busses with separately excited fields, also dealt with collectively. The source of common supply may be the usual direct current supply in the case of a mill having this source of power; a separate D. C. Generator may be installed; or, again, a motor-generator set may be used where A.C. supply is produced only by the prime movers.

A separate motor-generator set or generator may be used for each paper machine, or a common supply for several machines with a special booster set for each machine. Where very small speed variation is required by all the machines in the mill, the whole of the motors may be supplied by common busses, and the entire speed variation be accomplished by shunt control of the motors collectively, the Inter-lock deal-

ing with each motor specially and harmonizing common voltage supply and particular speed required.

A light master shaft (1½-in. diameter at Laurentide) runs the full length of the paper machine. This shaft may be located in any suitable place, above the floor, on the floor, under the floor, or in the floor. A visitor to the machine room at Grand' Mere will have difficulty in finding it at all. At every section of the machine a spur shaft is driven from this master shaft through a ball bearing bevel gear box, the small bevels running in an oil bath. Each motor through a cone or expanding pulley drives a second spur shaft supported in ball bearings, both spurs terminate in a differential gear box, the one spur is an index of the speed of the master section, the other is a correct and accurate speed index of the section motor speed in each case.

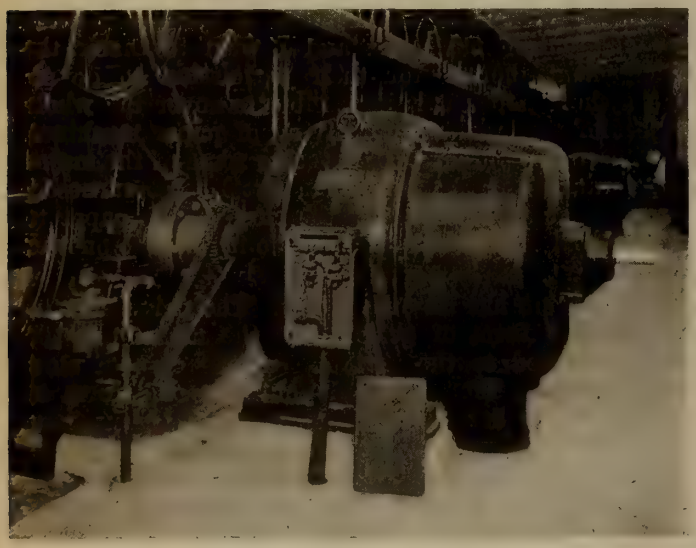


Fig. 3.
Typical sectional drive unit as installed on Laurentide's new machines.

At this point I would like to repeat once again. The only way to transmit power by a belt is by having a difference between T and t. If there is not any difference in the tensions no power can be transmitted. If there is a difference in the tensions between the two sides of the belt such as is met with in power transmission the ratio of stretch and slip will vary between full torque and no torque about three per cent. But, if "T" is the same as "t" the stretches are equal, and the slip is zero. Such is the case with the Inter-lock pilot belt. It is not called upon to transmit any power at all, except what is required to drive a 1½-in. shaft, a foot or so long, in two ball bearings and what torque there is remains for all practical purposes constant. The belt is able to deal with any torque met for this tiny duty a thousand fold, therefore:—(in the case of the Inter-lock) "T" is equal to "t"; stretch 1 is equal to stretch 2; slip is zero; and so the spur shaft driven by the motor is a true and perfect index of the motor speed at all times.

To return to description; (Fig. 4) the master shaft A runs the full length of the machine, and has at the side of each section, a bevel gear box B and a master spur shaft C inserted. Now, it will be clear that as all these master spur shafts are gear connected to the common master shaft, they will all run at exactly the same speed as the master shaft at all times, granted equal gears.

Each master spur terminates in a differential gear box, D such as is used on every motor car, another spur shaft E terminates in the other side of the differential gear box but in this case the spur is driven by section motor. F.

Every differential comprises three movements, one of which is the exact reflection of the difference in movement of the other two. In the case of a motor car the third member is a third shaft, the case being stationary; in the case of the Inter-lock, the third member which reflects any difference in speed between the two spur shafts is the differential case itself. The case is supported by the two shafts, C and E, and is free to move and indicate any angular variation of the two shafts.

Now so long as the motor makes the same number of revolutions per unit of time as the master shaft, the motor driven spur will make the same number of revolutions as the master spur (granted the draw control belt is set for equal diameters of cone pulleys H) and if the motor makes the same angular speed in degrees per unit of time as the master shaft, then the motor driven spur will make the same number of degrees movement as the master spur and there is no tendency for the differential case to move at all. So long as the two spurs move at the same angular speed, the case of the differential cannot be moved, except by such force as will strip the teeth of the differential gear. We see therefore that the case is a complete and accurate reflection of the difference in speed between the master and motor spurs, no matter if this difference in movement can be measured in revolutions or only in degrees regardless of time; so, if in any period of time the motor spur has moved out of synchronism one degree, the case of the differential gears, and one revolution of the differential

Shunt regulators G are used in conjunction with the differentials, and the combination of these elements holds in relative synchronism the speed of each motor in relationship with the master shaft. The effect of a shunt regulator is so well known that there is no need to describe effects of same here.

The arm of the shunt regulator G in circuit with each section motor is mounted on the case of the differential gear, D, and one revolution of the differential gear case will move the arm of the shunt regulator

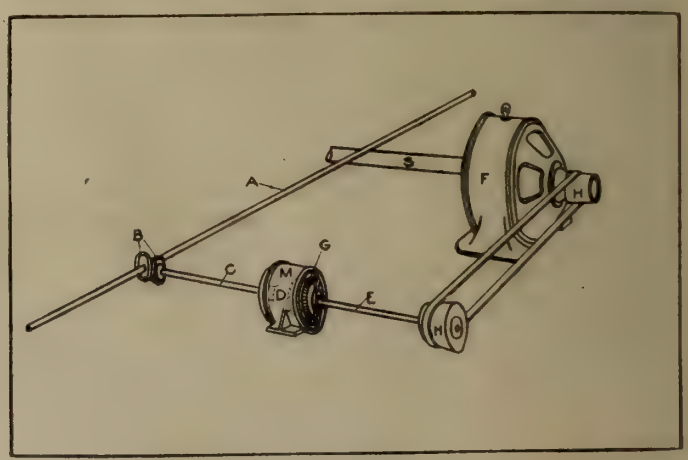


Fig. 4.—Diagrammatic arrangement of Inter-lock; showing master shaft A; spur gear B; master spur shaft C; motor spur shaft E; differential gear D, connecting C and E; gear housing M carrying contact circle of shunt regulator G (regulator arm is carried by differential case); sectional motorF; dryer driving shaft S; and cone (or expansion) pulleys H connected by belt L, which has only to turn shaft E in its ball bearings. It is the setting of this belt which controls changes in draw up to 20%.

one complete revolution, or in other words from minimum speed setting to maximum speed setting of the motor; this speed variation control may be as much as 100% of the normal motor speed, that is to say one revolution of the differential case and therefore one revolution of the shunt regulator arm will have swung the motor speed from slowest speed to double this speed.

This powerful force of speed control is used to synchronize the motors with the master shaft; in operation the differential case is almost stationary, therefore, as must be the case, the master and motor driven spurs make the same speed exactly, which is the desired result.

There would appear to be some difficulty in understanding the synchronizing feature of the Inter-lock and it seems to me that it would be helpful in understanding this feature today if I quoted what one man has written and then to answer it. In an article dealing with sectionalized drive some months ago, was written:

The following words referred to above are written under the nams of an engineer:—

"There are several types of sectionalized drives on the market.....which have some form of speed governor which cannot act until a change in speed has actually taken place, in other words, something must happen before it can be corrected and there is a possibility of breaking the sheet before the governor functions."

Now let us look at this matter together, let us see if we can find the difficulty that this engineer has. Let us see if we can show that he is worried without a cause.

We have seen that a single belt drive on a section may, with a change of load as little as 20% cause a change of draw of 100% to 200%; sometimes the paper breaks, sometimes it does not. Now let us see how the Inter-lock behaves. The motors are controlled in speed by shunt regulators operated by the sensitive differential gear which reflects on the regulator any *tendency* to get out of step, by any motor, not in revolutions, hardly in degrees, 360 of which go to make one revolution; the two shafts terminating in the differential gear box, one geared to the master shaft and the other as good as geared to the motor, will make the same number of revolutions per second, per minute or per day. The one is a correct reflection of the revolutions made by the master shaft, the other of the motor to be controlled. If the master spur has ticked off on a cyclometer dial during a continuous run of the paper machine one million revolutions, the corresponding motor spur shaft will also have ticked off one million revolutions plus or minus one depending which is phasially in advance; that is if the cyclometer dials are accurate!! How can it be otherwise, for if the differential gear case moved one revolution the motor would in such period of time have doubled its speed, and for every revolution of the differential case the motor would have varied in speed 100%, the motor swinging between a normal speed and double speed per revolution of the case. Certainly no paper could be produced under such wild conditions. No, that shunt regulator is securely locked in space, also the differential case, and so, the master and motor spurs run at the same speed exactly; they are synchronized, and so the motors also are compelled to run in synchronism with the master shaft and so with each other. Let us see why. The contacts on the shunt regulator are relatively few in number. If there were a million speed contacts it would not be possible on any one contact to obtain such speed synchronism as mentioned, such equilibrium as would give the cyclometer dial readings as mentioned above between the two spur shafts, and so the regulator arm quietly "breathes" a few degrees in between two neighboring contacts.

No contact on a shunt regulator could give 100% speed perfection and so the regulator gives this in effect by using electrically a selection of two contacts to get exact speed synchronism.

Suppose the master shaft to be running at 500 revolutions exactly, and that it be desired to run the motor at 500 revolutions as well, suppose that the setting on the cone pulleys was 50/50 or midway position, then the spur shaft would run at 500 revolutions as long as the motor driving it ran at this speed. The brush on the shunt regulator lies electrically on a contact at an instant which would give, say, a speed on the motor of 525 revolutions; this is too high a speed, and so the brush actuated by the movable case of the differential moves a few thousandths of an inch away from this contact. The new position says in effect to the motor, you shall run at 475 revolutions. This immediately starts the brush on its return travel a few thousandths. It is then told to run at 525 revolutions again and so it returns a few thousandths of an inch to the 475 revolutions stop. In practice it is very difficult to see this operation with the naked eye, the movement is so small, but electrically that is the effect, the motor actually running at the desired 500 revolutions all the time.

It is not a case of the motor running for a few seconds at 475 revolutions and then a few at 525 revolutions; that is clear, for if such was the fact the case would be running at the difference in speed in one direction or another, but we have seen that the differential case is for all practical purposes stationary; the electrical effect is to give an average field on the motor which exactly corresponds to the 500 revolutions desired without any speed fluctuation at all.

Now let us examine a change of load conditions. Let us take say 20% load increase the same as taken with the belt. We have seen that such a load variation could make a speed change of 1% or a draw change of 100 to 200%.

A normal variable speed motor uncontrolled under similar conditions might vary in speed anything from 1 to 6% depending on the portion of the paper machine range of speed it was operating under, or in other words might be six times as sensitive as a belt under normal average behavior.

Let us assume 5% change in speed tendency and trace the operation out through the Inter-lock control.

We have seen the motor shunt regulator slowly moving between two contacts and giving a speed of 500 revolutions per minute; now the motor tries to run at 5% less speed, or in other words at a speed of 475 revolutions.

Under the old condition we had two contacts on the shunt regulator which at that load gave speeds of 475 and 525 revolutions, respectively. Under the new condition of load these two contacts would become respectively 450 and 500 revolution contacts, so theoretically we have a condition where the brush arm would, with the change of load, remain quietly on the higher speed contact.

In practice such a state of equilibrium never exists but the brush arm would lie a tiny fraction of its time electrically in connection with the old 475 revolution contact, which is now a 450 revolution contact, and the majority of its time electrically in connection with the new 500 revolution contact, or it would decide to move between the next higher contact and the 500 revolution contact and there remain until the condition varied again.

The effect on the motor is like that on a synchronous motor, in regard to its fellows; it has moved a few degrees out of phase and then rested so much out of phase with its fellows, but the periodicity of turning is exactly the same as before. These direct current motors are made to behave together exactly as synchronous motors with any one setting of draw, but any draw can be obtained by moving the belt on the motor speed index pulley (H in the diagram).

Now let us examine how change of draw is achieved. We desire the motor as indicated first to run at 501 revolutions instead of 500, the belt is shifted on the motor and motor spur cones in a way that would tend to make the motor spur run 1 revolution per minute slower, the regulator arm would according to the law of the differential try to run at one-half a revolution per minute slower than previously, but this would bring the arm first of all electrically in connection with the 525 revolution contact which is too fast, and so in effect what happens is that no change is observed by the eye on the differential arm but actually it pauses a little longer electrically on the 525 revolution contact and a little shorter on the 475 revolution contact and the speed of the motor driven spur is still the same, but the speed of the motor shaft is 1% faster than before, i.e., the motor is now running at 501 revolutions, whereas before it was running at 500 revolutions. The naked eye cannot see any change of position of the regulator brush at all, but a speed counter will show the motor running one-fifth of one per cent faster than before; the motor will continue to run at exactly 501 revolutions for all time so long as the belt setting remains the same and the master shaft runs at 500 revolutions.

If the master shaft is varied in speed 10%, which is accomplished by deliberately changing the speed of motor which drives this shaft, every motor will vary its own speed 10%, and the proportional speed relationship of all the motors to each other will remain just as before, *exactly as before*, and the draws will remain constant in percentage although the speed of the paper machine as a whole has been changed 10%.

On the No. 8 Laurentide machine, with paper web for the first time passing over the fourth press only at about 600 feet per minute, the word went to the control room—"1,000 feet', the speed rapidly rose, draws remained untouched, and the catenary of the paper between presses indicated no change of sag or tightness, things went on merrily until the strainers overflowed from some cause unknown to me—I am not a paper maker—and the stock gave out at a speed of about 950 feet per minute; then of course the experiment stopped!

I think we have dealt with our engineer friend's difficulty (of snapping the web due to functioning of the governor) but if any point has not been made clear, I shall be glad to answer questions.

It may be said that such a degree of perfection is not necessary. We have seen how crude the mechanical drive of a paper machine is when analysed, but what does such perfection of speed control mean to you? It means dollars and cents. It means less stoppage, less "broke," the possibility of producing paper to a keener specification, the possibility of producing paper at a higher speed; paper to the same specification from cheaper materials; more uniformly tough paper;—a more uniform quality of the product in every respect.

Let me suggest to those of you who carefully analyse conditions that you try different draws per section along with microscopic and other analysis of stock. You know now that the draws will be constant, and see which draw produces the test results.

On old machines you will be able to creep up in speed inch by inch, limited only by the mechanical condition of the paper machine itself.

One day, a dear old man said to me: "Yes, I would like an Inter-lock between the dryers of my machine and the calendars, that is where most of my broke is made." But as in the human body, the trouble does not always express itself at the original place of error. The origin of his trouble might easily have been between the couch and the first press where undue strain crept in unobserved and only showed up at the calendar.

Gentlemen, I am at your service to answer any questions dealing with the matter just read that are within my power to answer.



W. A. ANDERSON, Chairman, Eastern Canadian Division Pulp and Paper Superintendents' Association.

Beating—Today and Tomorrow*

By W. B. CAMPBELL, Process Engineers, Montreal.

Before attempting to say anything about the beater of today, a brief reference must be made to the beating practise of yesterday. The reference is necessarily brief not only on account of the limitations of time for this present paper but also because a much more interesting account of early beaters has recently appeared. I refer to the illustrated article by Mr. Dard Hunter in the Paper Trade Journal of November 4th, 1920.

When rags were first used for paper making, in about the year 1100 A.D., they were first partially disintegrated by a rotting process and then beaten to a pulp by hand, using a mortar and a pestle or by pounding the cloth with heavy paddles while it lay on a stone.

This primitive method was improved upon by applying mechanical power to the mortar and pestle, thus making it in principle the same as the modern stamp mill. The old stamping mills consisted of rows of heavy wooden hammers which were caused, by means of a series of cams on a stout axis, to rise and fall into pans containing rags. These stamps were slowly developed from the first crude machines until mills had as many as six pans with three stampers to each pan. The stampers in each machine were divided into three classes: The first set were shod with heavy, rough, iron teeth which would mangle the cloth. When sufficiently treated in this pan the rags were bailed out and put into the next pan where the stamps were less heavily shod. The final treatment was given by stamps of plain wood. The whole process of beating took about thirty-two hours, and a mill with six pans could produce about five hundred pounds of paper a week.

Paper mills using the stampers were general in Germany and operated by water power. They were also used during the first century of paper-making in America. In Holland, however, there was no water power and the inventive Dutchmen were forced to devise something which could be operated by the wind and they evolved the "Hollander" some time about 1670. It consisted, as it does at the present day, of a roll with knives turning in an oblong tub rounded at both ends and fitted with a backfall and midfeather.

It is rather humbling to look at the old prints such as are shown in Mr. Hunter's article and consider how little we have progressed in the last two hundred years. Mechanical improvements there have been, of course. We have substituted metal for the original wooden roll; we no longer drive by wind power transmitted through wooden cog wheels; our machines are larger and much better constructed. But in principle, we have made no great progress, certainly none equivalent to the big step taken in 1670 when the Hollander was substituted for the stamp mill.

Attempts to improve beaters have not been lacking and a complete account of the various inventions would require a large book. As many of these modifications contained ideas of value it is reasonable to inquire why they failed, for if survival be the test they must be considered failures. With the exception of the Jordan, they have all gone to the scrap heap and would be quite forgotten if they did not appear before us embalmed on the pages of all the older text books on paper-making. Such things do not happen by chance, and it must be that the ordinary beater, crude as it is, has some valuable features that outweigh the advantages contained in the modifications. If permanent improvement is to be effected these inherent good qualities of the old Hollander must be kept in mind.

The outstanding feature of the ordinary beater that has kept it in use all these years is the fatal facility with which it can be used to secure any result desired. Whether this stock is wanted long or short, slow or free the beater can produce it. Inefficiently it is true, but if properly handled it does produce the desired product. This is unquestioned. That the beater is inefficient is almost equally unquestioned.

Before discussing further the design of beaters it is well to consider the functions which it performs. In most mills it is made to act first as a shredder; heavy laps of pulp, frequently frozen, are fed to it and it is expected to chew them up with ease. It is expected to tease out and separate the individual fibers whether these be originally in rags, in woody bundles or simply felted together as in the lap pulp. It must brush these fibres so as to fray the ends—at least in the case of cotton. It must cut the long fibres to a suitable length. It must, by its action, cause the fibers to become hydrated and form more or less of what some authorities term "mucilage." It must act as a mixer for the incorporation of loading, colors and size. In many cases, it is expected also to act as a washing machine for the removal of undesired impurities. And late in years, it has been expected to do most of these things under the supervision of unskilled labor.

Many of these duties are not really duties of the beater, yet as they are loaded on it they must be considered. It is unfair, for instance, to expect the beater to be an efficient shredder and as this is becoming realized, it is more common to find lap stock passed through a shredder before going to the beater. There is little to be said against the use of the beater as a mixer as this does not interfere with its real beating action. It does seem questionable whether it is good practice to go on beating after the size has been precipitated on the fiber. Using a beater as a washer does not interfere with the beating action but surely some more efficient washing methods could be devised—probably along the lines of a Decker. Of the duties to be performed by the beater we have left only those of cutting the fibers, separating them from each other and bringing about those peculiar physical and chemical changes included under the term of hydration or making the stock greasy.

In the earlier days of papermaking, the raw materials were chiefly rags, either cotton or linen, together with some jute—all long fibred material. Under these conditions it was imperative that these fibers be shortened for the production of fine paper,

*Read at the annual meeting of the Technical Section of the Canadian Pulp and Paper Association, Montreal, January 19th, 1921.

and the equipment of the Hollander with steel bars was the natural thing to do. In early days beaters were small and rolls were light—they could be let down so that nearly all their weight was on the bedplate and the cutting action was not out of proportion to the rubbing action to produce a good pulp. But as beaters were made larger and the rolls heavier it was found that even with rag stocks it was necessary to keep the roll up longer so as to give time for the hydration without unduly shortening the fiber. To put it another way, the beater bars had too much edge in proportion to surface when heavy rolls were used. Had it not been for the adaptability of the Hollander, this would have been sufficiently marked to call for a change in design but as simply keeping the roll up allowed the production of properly prepared stuff, no alterations appeared neecssary.

Then wood pulps came along. Having naturally short fibers, cutting was rarely necessary so that the functions of the beater were reduced to separating the fibers from each other and producing whatever hydration was necessary. Beater bars were made wider and blunter. The weight of the roll was seldom allowed to come fully on the bedplate. Kollergangs were frequently used as they provided a pure rubbing action although giving but small production for the power expended. The logical alteration of the beater roll brought into use the lava stone rolls—thus giving greatly enlarged rubbing surface and suppressing the cutting action. To those who had come to believe that time was the important factor in producing hydration and the increased strength that goes with it, the results were amazing. Beating time was, in some cases, reduced to one-eighth. Indeed the stone beater roll is claimed by some to make the stock too greasy simply because they cannot bring themselves to stop beating after the short time really necessary to finish the work.

Aside from considerations of beating surface there must be taken into account the movement of the stock to and from the point where the beating action takes place. In both the original Hollander and type of beater seen in ninety-nine out of every hundred American mills today, the stock must move in a trough having almost rectangular cross section and the very sharpest bends. Not an engineer in the country would consider forcing a stream of air or water around such a sharp bend as is provided for the movement of the thick viscous mass of stock and water in the usual beater. When the stock does complete its slow and stately progress to the roll, it is snatched up and, at the expenditure of much good energy, it is given a very brisk velocity indeed. But it loses this velocity and energy almost immediately as it is banged against the hood and so drops down to resume its unexciting travel around the tub under the impelling force of nothing more than the hydraulic head provided by the height of the backfall. These defects were in part remedied by European engineers by widening the midfeather, raising the backfall, giving the tub a bottom with a slope all the way from the backfall to the front of the roll and making the trough more nearly semi-circular in section. Such a design is found in the Marx beater introduced here about ten years ago and in the recent Niagara beater. The change made it possible to circulate stock of seven or eight per cent consistancy at speeds of about twenty-five feet per minute as against four or five per cent at ten or fifteen feet per minute. A still later advance in the same direction is the Rabus beater, the first American installation of which is just now going into operation. In this the stock is carried right back over the top of the roll, thus conserving nearly all of the momentum of the stock and doubling the static head which gives circulation. The trough is nearly circular in plan, giving little resistance to flow. Such beaters are operating with consistencies of ten to fifteen per cent and circulation speeds of forty-five to sixty feet per minute.

Such has been the development of the beater itself; there has been another line of advance in beater practice,—the increasing use of the Jordan. As originally intended, the function of the Jordan was simply to give a final shaking out to the stock, which at the comparatively high consistency of the beater, had a tendency to bunch together in clots. But of late the Jordan has been made to encroach on the work of the beater. By widening the bars or by giving it a lava stone filling and backing up the stock at an increased consistency, the Jordan can be made to do nearly all the work of the beater. In such instances two or more Jordans are placed in series. For some classes of work, at least, the system has many advantages and it is to be expected that it will increase in favor. It may even be that the Jordan will be so developed as to replace the beater entirely, but this is doubtful. It is more likely that the beater and the Jordan will develop side by side, each doing the work for which it is best fitted.

The directions which the development will take are, of course, entirely a matter of surmise and personal opinion. Where real beating is wanted, and by that is meant the production of more or less hydrated stock either for increased strength or for parchmentising qualities, it seems logical to expect that the rubbing surface will be greatly increased, either by the use of lava stone or by some similar material. The same holds for those cases where a refining action is wanted, such as with knots or screenings. Here it is necessary to rub apart the fiber bundles with as little damage as possible to the fibers themselves. To do this it is not necessary actually to rub the fibers between two more or less rough surfaces—the same effect can be secured by bringing the stock at high velocity against a rough surface. This might be done by lining the entire hood with lava stone, for instance, in beaters where the stock is brought up over the roll. That this will effectually break up fiber bundles is shown by the Stobie disintegrator which depends entirely on this action for results. Although wasteful of power in many respects, it is reported that this apparatus is about as efficient as the ordinary beater.

This change might even be carried farther and the hood, at a distance of only a foot or so, be brought down in front of the roll so as to return the stock immediately to the working space between the roll and the plate. A very few turns of the stock in such an arrangement would give quite sufficient beating action and it would be necessary to make the beater continuous by feeding fresh stock at one side of the roll and withdrawing it at the other. Control could be effected by adjusting the flow of stock to

and from the beater. Such an arrangement would utilize to the full the velocity imparted by the roll and would, in effect, be a continuous beater having a circulation speed approaching the circumferential speed of the roll. It would provide all the flexibility of the beater which has kept it in use these many years, yet it would be an efficient machine. It will be noticed that this is a hydrid of the Rabus beater and the Jordan refiner. Evolution usually proceeds by crossing varieties so as to combine the advantages of each.

Before leaving the subject, something should be said of the recent researches on the subject of beating and the lines along which future research may well be pursued. Miss Miner, in recent papers, has thrown a great deal of light on the intricate physico-chemical reactions which go to create the parchmentising effect and, when not carried to an extreme, the increase is strength. It is rather dangerous to attempt to describe her work in a few words but it may be summariezd about as follows:—

The parchmentising effect is due to the production of gelatinous cellulose which, for want of a better term, is called "mucilage." This mucilage is a complex of cellulose, hydrocellulose and water in one of those peculiar combinations, half chemical and half physical which are so frequently encountered in colloids. If the original stock contains hydrocellulose, the mucilage is developed very quickly by the mechanical action of the beating. If it does not contain hydrocellulose, then the mechanical action first causes the water to dissolve in the cellulose forming a cellulose hydrate and then a part of this breaks down to hydrocellulose and a jelly is formed. Further action of the water causes further breaking down and the formation of soluble compounds. If the cellulose is such that it can form hydrocellulose only very slowly under these conditions then the second breaking down may be at such a rate as to destroy the "mucilage" as fast as it is formed and it will be impossible to secure a parchmentising effect. If, on the other hand, hydrocellulose is formed by preliminary action of acid or in some other way, then the production of "mucilage" is extremely rapid. It is to be hoped that this work will continue as it is of great value in providing a basis for intelligent work on beating.

Kress and MacNaughton in a paper published in 1917 described some interesting experiments which they made at the Forest Products Laboratory at Madison. Unfortunately, their report leaves out data as to power and circulation which seem necessary to show its full value. Without this data their conclusions may be reduced to the fact that a 2 per cent stock was acted upon with greater rapidity than was stock of greater consistency and that the sedimentation test, while it does indicate the slowness on the machine, is no way an indication of the character of the beating. Taking their experiments in conjunction with some unpublished—and unfinished—work at the Forest Products Laboratories of Canada, some interesting conclusions may be reached. Although they rest on rather unstable foundations they may be briefly stated here in hope of future confirmation. They are as follows: The production of a beater, other things being equal, is in proportion to the weight of fiber which passes the roll per minute; and that in any one beater the amount of fiber which passes the roll per minute per horse power, or in other words, the production per horse power, is constant over a considerable range of consistencies. A few weeks work with beaters such as those at the Forest Products Laboratories, together with a hand sheet apparatus as described on the next page by Wilen, should be sufficient to confirm or modify these points, which, if proved, would be a considerable step toward the handling of beating on a scientific basis.

SALESMEN SHOULD KNOW PAPER QUALITY.

Mr. F. C. Clark, Director of the Department of Technical Control of the American Writing Paper Company, recently addressed the salesmen of A. Storrs & Bement Company, of Boston, on the subject of paper testing methods.

He said in part: "It is a well recognized fact that an accurate knowledge of the materials and chemicals entering into the composition of a paper is of great value to every paper-maker, paper-buyer, or salesman. At the present time there is developing, both within and without the paper trade, a growing interest in the subject of paper testing. There is a demand on the part of the buyer for better methods to enable him to determine the quality of a paper for his particular need, and how is the salesman to answer the questions of the buyer if he does not know something about the quality of the paper he is trying to sell and what tests it will be subjected to before it is accepted? That there is this growing interest in the subject and a general demand for standard methods of testing, is most conclusively shown by the work which is being accomplished in the commercial paper testing laboratories that are starting up in various parts of the country.

"This increasing general interest in paper testing has been a stimulant to the manufacturer to produce a paper that will more than meet the specifications required, and it gives the salesman real facts to talk about. How few of the salesmen of the pas knew the quality of the paper they were trying to sell, and how it compared in strength and furnish with a competitor's paper! There is no reason to-day for the salesman's not knowing every fact about the paper handled by his company."

Mr. Clark then explained in detail the methods used in testing paper, dividing them into three classes—microscopical, physical and chemical. He also showed the value and relation of these tests in determining the quality of a paper.

A. W. P. Co. Sends Stock Card Index.

Something new in paper merchandising has just been forwarded all agents for the American Writing Paper Company Eagle-A Mill Brand lines in the form of a mahogany finished Desk File for the semi-monthly Stock Record Cards that the Company has customarily issued on all of its mill brand lines.

This container provides places for pens, pencils, and filing space for the stock record cards.

These cards show all standard Eagle-A lines as they are stocked at the mill giving exact quantities of all items available, together with suggested resale prices. This list includes Bonds, Books, Blue Prints, Envelope Stock, Covers, Index Bristols, Ledgers, Weddings and Papeteries, Writings and Typewriter Papers.

If Safety was given the same consideration as other business you would see a great change in this old world.

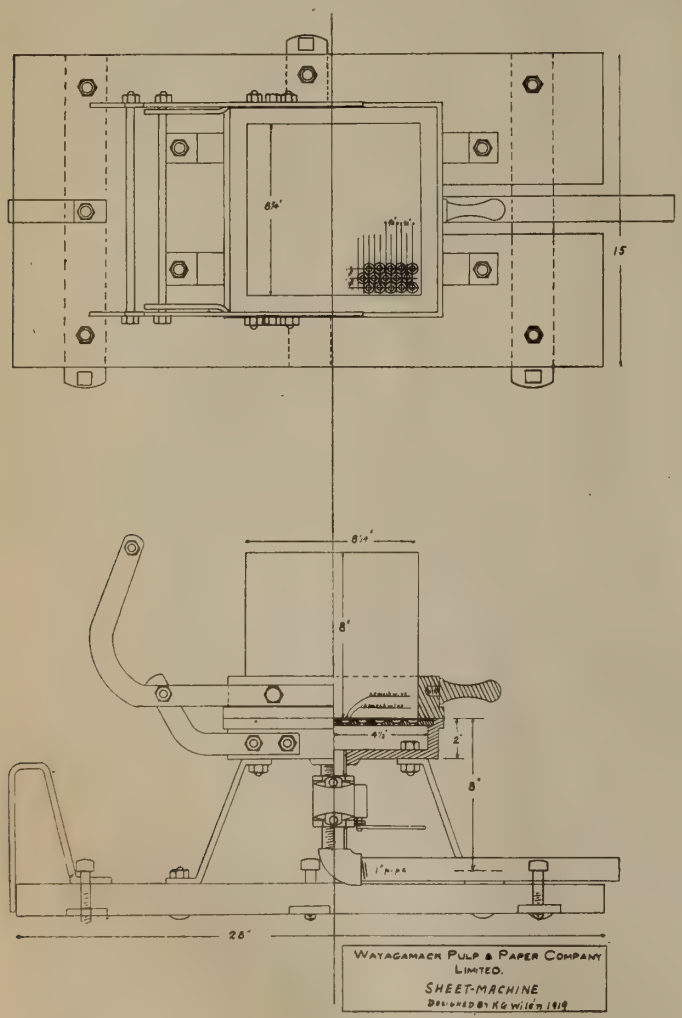
Testing Sulphate Pulp for Strength*

K. G. WILEN.

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The necessity of testing pulps in general, and kraft pulps in particular, for strength, is too obvious to need any further elaboration.

The old way of testing pulp for strength by simply tearing a piece of pulp taken from a wet lap or from a dry sheet has only within the last few years been superseded by methods which really give results which may be taken as an indication of the strength of the pulp for papermaking purposes. The first published method which I have been able to find is described in an article by E. Sutermeister in "Paper" of November 10th, 1915. The method employed by Sutermeister consisted of the making of handmade sheets of pulp which had been beaten in a ball mill, and testing these sheets for bursting strength with an Ashcroft or a Mullen tester. Various modifications of Sutermeister's method have been published from time to time but in most cases the strength of sulfite pulp only has been dealt with. A few years ago an investigation of the properties of sulphate pulp produced under different cooking conditions was started in the laboratory of the Wayagamack Pulp and Paper Co., Ltd., and then it became necessary to have a method for testing sulphate pulp for strength. After trying out the methods used or recommended for testing of sulphite pulp the following method was found to give satisfactory results with sulphate pulp.



The method of testing sulphite pulp for strength published by the Committee on Sulphite pulp of the T.A.P.P.I. in "Paper" November 8th, 1916, was tried out on kraft pulp but proved to be unsuitable in several respects. The proportions of pulp, water and pebbles in a jar of given size, as published by the above Committee, did not give the most satisfactory results as regards beating, and according to our experience the hand mould leaves much to be desired with regard to the uniformity of the hand made sheets. There did not seem to be any obvious reasons for testing the sheets with the Asheroft tester, as long as the Mullen tester is universally used for commercial purposes. It appeared to us more desirable to express the results of the strength test on a basis which would give a direct comparison with results obtained in actual practice on the paper machines, particularly as the method finally adopted could then be used for placing the blame for any paper not showing the proper test on the pulp mill or the paper mill.

The method of testing pulp for strength which has been followed in the laboratory of the Wayagamack Pulp and Paper Co., Ltd., for the last three years is briefly as follows:

25 grs. of air-dry pulp are thoroughly broken up by forcing the pulp through a screen with 1-16-in. round holes by means of a jet of water. The screened pulp is then collected on the sheet-machine described below, and placed in a tared weighing cylinder. The contents of the cylinder are then made up to 3 kgs. with water and transferred to the ball mill jar. The volume of the jar is 4.50 litres and it contains 2,500 grs. of pebbles of such a size that there are 250 pebbles in each jar. The pulp is beaten for one hour in the ball mill at a speed of 66 r.p.m. The beaten pulp is then washed out of the jar and made up to 10 litres in a vat from which three measures of 450 ccs. each are placed in a pail and made up to approximately 5 litres with water. After thorough stirring the contents of the pail are poured on to the sheet-machine.

The sheet-machine consists of a rectangular box, the upper surface of which is made of a perforated brass plate. A 14 mesh backing wire and a 60 mesh machine wire are soldered to the plate. When a sheet is made the "deckle box" is placed on the wire. A quick opening gate valve is used for draining the water from the machine. (See diagram).

The "coucher" consists of a square block of wood about 10-in. x 12-in. The under side of it is curved on a 30-in. radius. The thickness in the centre is about 1¼-in. and at the edges ½-in.

* Paper read at the annual meeting of the Technical Section of the Canadian Pulp and Paper Association, Montreal, January 19 and 20, 1921.

As soon as the pulp is transferred to the machine the drain valve is opened and the water allowed to drain off until the suction on the sheet is released by air entering the drain pipe. The "deckle box" is lifted off the machine and the coucher is covered with a wet felt and the front edge of it placed on the wire. The coucher is then pressed down rapidly until the back of it comes in contact with the wire. The sheet will then be firmly held by the felt. The felt is next removed from the coucher and placed on a board which fits into a letter press. In this manner 5 sheets are made and placed on the board. The top sheet is covered with a felt and the board is placed under the press. The sheets are pressed for about 15 seconds under all the pressure that can be put on the press by hand. The sheets are then transferred on to wire trays and placed in a drying oven and dried at 180 deg. F. When thoroughly dry the sheets are taken out and allowed to reabsorb the hygroscopic moisture for 1 hour. They are then cut to 6-in. x 6-in. and weighed to the nearest .05 of a gram. The weight of the sheets is calculated to lbs. per ream of 480 sheets 24-in. x 36-in. *i.e.* the commercial weight-standard for kraft. The sheets are tested on the Mullen tester in the four corners and in the centre. The average Mullen test multiplied by 100 and divided by the ream weight of the sheets is the expression for the strength of the pulp, in other words the strength is expressed as per cent of "point per pound."

Generally speaking, the results obtained by this method of testing pulp for strength can be taken as a very fair indication of the strength to be expected from the pulp on the paper machine as long as the degree of hydration imparted to the pulp in the beaters is not materially different from the hydration produced in the ball mill. It is usually only in the case of extra soft kraft bag paper that the relation between the strength of the hand made sheets and the paper made on the machines varies from a definite figure.

In arriving at the above method of testing pulp for strength a number of experiments were made in order to ascertain the influence of the different factors involved, on the final result.

Some of the factors studied were:

(1) Dryness and methods of drying pulp samples before testing.
(2) Concentration of pulp in ball mill.
(3) Weight of test sheet made.
(4) Weight of pebbles.
(5) Duration of beating.
(6) Method of drying test sheets.
(7) Effect of smoothing wet sheets by pressing between sheets of heavy paper.
(8) Influence of pressure applied in couching sheets.
(9) Influence of pressure applied on wet sheets after couching.

The influence of the factors will be discussed in the same order as they are enumerated above.

DRYNESS OF SAMPLES BEFORE TESTING.—A sample of pulp was taken from the vat of a wet machine when a lap was being made. The lap was then treated as follows: one part of the lap pulp was allowed to dry in the air and another part was dried in the drying even at 210 deg. F. The four samples of the same pulp were then tested for strength with the following results.

Sample from vat	1	hour beating	142%
Wet sample from lap	1	" "	141%
Air dried sample from lap	1	" "	120%
Air dried sample from lap	1½	" "	134%
Air dried sample from lap	2	" "	137%
Oven dried sample from lap	1	" "	108%
Oven dried sample from lap	1½	" "	118%
Oven dried sample from lap	2	" "	126%
Oven dried sample from lap	2½	" "	125%

These tests have been confirmed a number of times and show clearly that the method of drying which pulp undergoes before it is tested for strength is of very great importance, in fact, some of the differences in strength obtained by quite radical changes in cooking conditions of kraft pulp proved to be much less than the differences caused by testing wet and dry samples of the same pulp. For convenience in breaking up the samples in the screen wet samples should always be tested whenever possible. The existence of a definite relation between the strength of the wet kraft pulp and the air-dry pulp has not yet been satisfactorily proved by us.

In testing a large number of dry kraft pulps it has invariably been found that these machine-dried pulps are weaker than the average run of wet pulp. While some of the dry pulps in their wet state, are undoubtly equal in strength to most kraft pulp manufactured, the drying of the pulp on the machines apparently makes dry pulps less desirable than wet pulp when maximum strength is required, both for kraft paper and test board.

Below are given a few tests of dry pulps:

1	121	
2	130	
3	113	beaten 1½ hrs.
4	124	
5	115	

Wayagamack kraft average (wet) 155 beaten 1 hr.

CONCENTRATION OF PULP IN BALL MILL.—The following amounts of pulp were placed in the ball mill jars with the same quantity of water beaten for the same length of time. The variation in strength is shown below:

Grs.	% Strength.
25	143
50	130
100	72
150	52
Unbeaten pulp	54

While it is easily possible to keep the quantity of pulp taken constant within 2 or 3 grams in each case, a large variation from the standard weight apparently does not influence the result very seriously.

INFLUENCE OF WEIGHT OF PAPER MADE.—For this experiment a sample of pulp was taken from the flow box of a paper machine when making 41 lb. kraft bag paper, in order to have the weight of the paper made as the only variable.

Weight of paper.	Mullen test.	% Strength.
31 lbs.	42	135
65 lbs.	95	146
114 lbs.	150	132

The strength of the paper made on the paper machine at the time the pulp was taken for the above experiment was 100% of "point per pound." From

the above figures it is seen that variations of 100% in the weight of paper made do not influence the results by more than 10%. In actual practice, the weight of the paper made on the sheet-machine is allowed to vary from 55 lbs. to 65 lbs. per ream because repeated tests have shown that no variation in strength occurs with this variation of weight, with the machine used by us. It has been noted that if light weight sheets are made on the sheet-machine thin spots are likely to occur and a low average test results. If, on the other hand, heavy sheets are made they crease in couching and low results again result. From 50 to 60 lb. paper has been found to give the most satisfactory sheets as regards uniformity of formation, etc.

WEIGHT OF PEBBLES USED.—A variation of 100 grams in the weight of the pebbles used. with all other factors constant, does not influence the strength of the resulting sheets noticeably.

DURATION OF BEATING.—The influence of the time of beating was found to be very marked until maximum strength is obtained but after maximum strength is reached further beating has comparatively little influence. It is of interest to note, however, that the "slowness" of the pulp increases uniformly with the time of beating, even after maximum strength has been reached. The slowness was determined with the Standard Schopper-Klem Sedimentation tester 0.5 gram of pulp in 200 ccs. of water were allowed to drain off for 15 secs.

Beating Time Hrs.	Mullen Test %	Sedimentation Test. ccs.
0	68	42
½	135	63
1	161	84
1½	168	103
2	166	120
2½	158	137

It should be noted that after beating for 1½ hrs. the pulp was too "slow" for the ordinary run of commercial kraft paper. The curves (p. 71) show graphically the influence of the time of beating on the strength and "slowness" of kraft pulp.

INFLUENCE OF METHOD OF DRYING THE TEST SHEETS.—Repeated tests made by air-drying 2 sheets and oven drying 3 sheets at 170 deg. F. from the same set of 5 sheets, have shown that oven drying at 170 deg. F. does not influence the strength of the sheets, provided they are left in the air for about 1 hr. after drying.

The following experiment was made in order to determine approximately at what drying temperature the sheets were made from pulp taken from a paper machine. The sheets were then treated as follows:

(1) 3 sheets were dried in a drying oven and the temperature was then raised to 240 deg. F. for 15 minutes. The sheets were immediately tested.

(2) 3 sheets were dried and heated to 240 deg. F. for 15 minutes and left in air showing a relative humidity of 60% at 80 deg. F. for 16 hrs. before testing.

(3) 3 sheets were dried at 214 deg. F. and tested after being exposed to air with 60 p.c. relative humidity at 80 deg. F.

(4) 3 sheets were dried at 180 deg. F. and tested after being exposed to air with 60% relative humidity for 1 hr.

(5) 3 sheets were allowed to dry in air with 70% relative humidity at 80 deg. F.

Sheets.	Strength %
1	100
2	126
3	150
4	150
5	152

It would thus appear that the sheets are not weakened by drying in the drying oven at temperatures below 200 deg. F. Drying in the oven at this temperature requires about 20 minutes, which means a considerable saving of time compared with the time required for air-drying, even when using a fan.

INFLUENCE OF SMOOTHING WET SHEETS BY PRESSING BETWEEN SHEETS OF HEAVY PAPER.—Attempts were made to improve the surface of the sheets by pressing them between sheets of heavy paper, but this procedure was found to increase the strength of the sheets very considerably. in some cases 25 to 30 points in 150. The smoothing had to be abandoned, however, on account of the irregularities in the increase of strength produced. To date no satisfactory explanation of these irregularities has been found.

INFLUENCE OF PRESSURE APPLIED IN COUCHING SHEETS.—In designing the sheet-machine the wire was purposely placed 1-16-in. below the edge of the box and the coucher made 2-in. wider than the box in order to minimise the effects, if any, of uneven couching pressure. With the machine as made, no difference has been found in strength of the sheets when they are couched off with the least pressure which will lift them off the wire and when they are taken off with all the weight a man can place on the coucher.

INFLUENCE OF PRESSURE APPLIED TO WET SHEETS BETWEEN FELTS.—The effect of the pressure to which the sheets are subjected between the wet felts was studied while varying the pressure from the lowest pressure which would remove enough water from the sheets to enable them to be handled, to the pressure exerted on them in a 500 ton bailing press. No variation in strength was noticed within the range of pressure obtainable with a letter press, but when the full pressure of the bailing press was exerted the strength increased about 12%. It is of interest to note in this connection that the sheets pressed with the baling press showed a parchmentizing effect and were nearly transparent.

Comparison of Pulps and Methods.

The principal difference between this method and other published methods is in the making in the sheets. It seems to be generally recognized by now that the hand mould is very unsatisfactory for making the sheets for several reasons. Firstly, the formation of the sheets depends very largely on the skill of the operator and secondly, when working with small quantities of pulp it is next to impossible to make sheets of uniform weight. Small circular sheets 5 or 6 inches in diameter are useless if the sheets are to be tested with the Mullen tester. The sheets being 7½-in. x 7½-in. as made on the above machine it is possible to cut 2 diagonal strips from each sheet for determination of breaking length and resistance to folding, as determined by Schopper's machines. and still have enough paper left to make six

Mullen tests on each sheet. The time required for making a set of 5 sheets is about 3 minutes and this is fast enough for all testing purposes.

In order to find what the difference in strength between different samples of kraft can amount to, samples from nearly all American mills and most Scandinavian mills have been tested, in addition to more than 3,000 samples of kraft of our own manufacture and over 100 different samples of pulp made in the cooking experiments.

The strength of commercial kraft pulps has been found to vary from 130% of point per lb. to 170% of point per lb. and the strength of the pulp made in the cooking experiments varied from 124% to 193%. The above figures all refer to samples which have been tested wet. The strength of the dried samples which have been tested varied from 90% to 140%, after beating for 1½ hrs. Under identical conditions of testing, sulphite pulps have been found to vary in strength from about 60% of point per lb. to about 110%. The number of samples of sulphite tested were, however, not sufficiently great to enable us to draw definite conclusions, but, apparently, the variations in strength of sulphite pulp are larger than in the case of sulphate pulp.

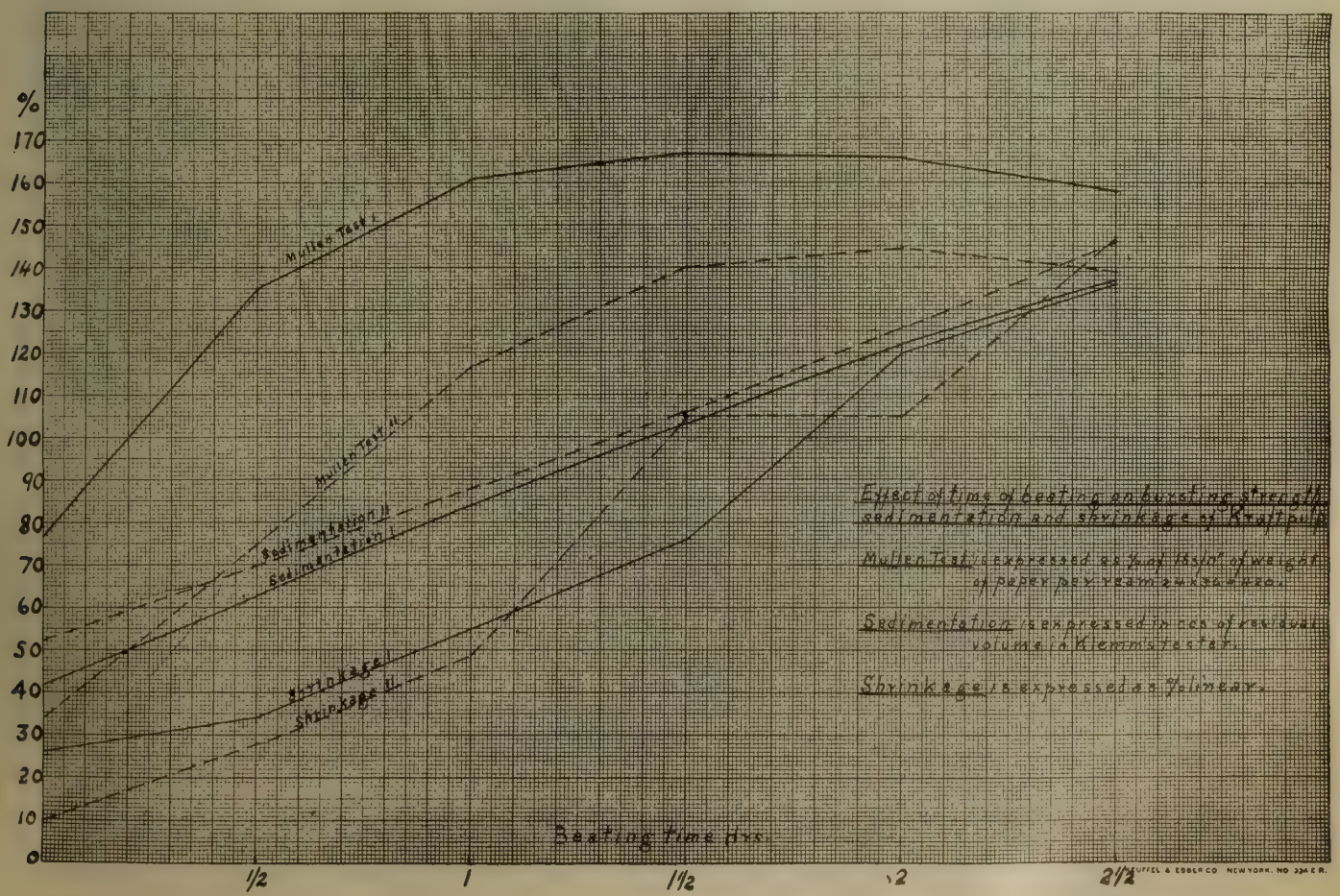
From a large number of comparisons of the strength of the pulp, as determined by the above method, and the strength of the paper made from it on the paper machines it has been found that as a general rule the paper machines do not develop more than about 75% of the strength of the pulp. A large number of tests have been made by taking pulp from the screens of the paper machines and making sheets by hand and comparing the strength of these sheets with the strength of the machine made paper. The hand made sheets have in every case been found to be from 20 to 50% stronger and are very often equal in strength to the hand made sheets made of the same pulp beaten in the ball mills. This is not only due to the better formation obtainable by making hand made sheets but also due to the fact that in making hand made sheets the whole of the pulp is retained on the wire but on the paper machine from 5 to 20% of the pulp passes through the wire and an examination of this pulp which passes through the wire shows it to be extremely hydrated and possess quite remarkable cementing properties.* It is therefore unreasonable to expect that machine made paper will ever be equal to hand made paper in strength. The strength of the hand made sheets, will, however, serve the purpose of showing if a low strength of paper is due to weak pulp or to faulty beating or to poor manipulation on the machine.

Conclusions.

As far as this method of testing pulp for strength has been investigated by us at the present time it appears to give a true indication of the strength of kraft pulps. A number of samples of sulphite pulps have also been tested by this method although the

*Note:—The editor once devised a sheet machine which was intended to approximate more closely the conditions on this paper machine by applying the same suction as is used on the boxes.

It would be interesting to have a comparison of strength factors in hand made and cylinder machine papers.



time of beating has been shortened to ½ hr. for sulphite, as sulphite pulp hydrates much more easily than kraft pulp. In general it has been found that different grades of sulphite pulp show a much greater variation in strength than sulphate pulps. The difference in strength of the strong and the easy bleaching sulphite pulp, made by a large Canadian concern showed a difference of about 45%, while the difference between the strongest kraft pulp and easy bleaching sulphate pulp is only about 20%.

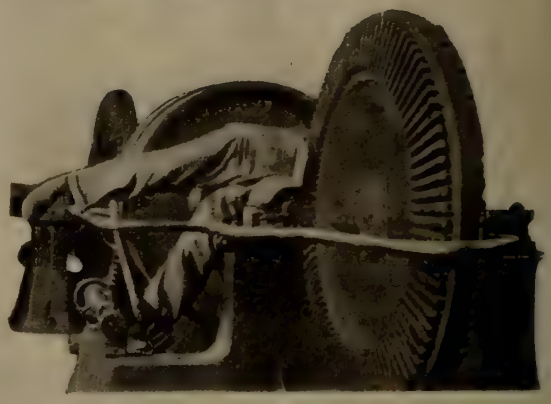
Kraft pulp is at present used not only in the manufacture of pure kraft papers but also in the making of various other grades of paper and board. It becomes particularly important to have a standard method for testing pulp for strength when mixtures of pulp are used because then the finished paper does not furnish any indication of the strength of any of the pulps used. An acceptable method for testing of strength of pulp must, of course, give concordant results on a given sample of pulp and as far as our experience with the method described above goes, there is no difficulty whatever in duplicating results within 2% even when the tests are made by 2 or 3 different operators.

The time required for a test is approximately 3½ hrs. and with a 4-jar ball mill 15 samples have been tested by one operator in 10 hrs.

Several attempts have been made to establish a relation between the time of beating and the Mullen test and the breaking length as determined with Schopper's machine, but so far no entirely satisfactory relation has been found.

Our object in publishing our experience with this method of testing pulp for strength is to obtain all possible constructive criticism of it, as the question of strength of pulp is of such importance to the industry in general that it merits all possible co-operation in order to establish a standard method.

CAUGHT!



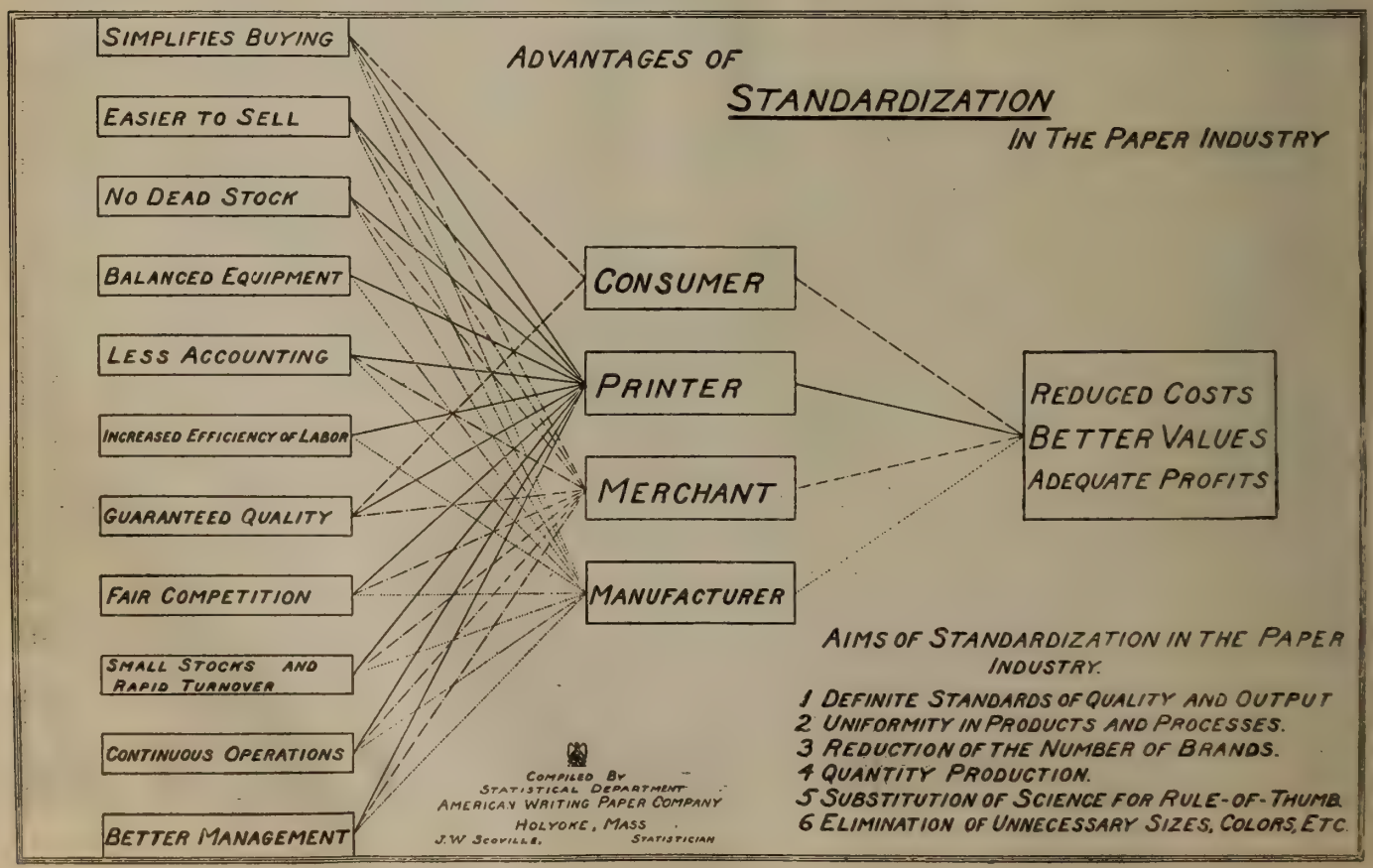
He had shut down the engine to make some repairs and was caught when a fellow employee started up.

If he had used this sign he would not have been injured.



Courtesy, Champion Fibre Co.

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Reports of Technical Section Committees

COMMITTEE ON MECHANICAL STANDARDS.

Previous to the Annual Meeting held in January, 1920, your Committee sent out a questionnaire covering various items on which the Committee on Mechanical Standards considered information should be obtained and tabulated. Nearly one year has passed since, and in spite of repeated requests, only a very small number of questionnaires have been received, hence it is very difficult to make a reliable tabulation from these questionnaires. Furthermore, even the questionnaires received give, to a very large extent, rather incomplete information, and your Committee is of the opinion that the majority of the mills have not fully realized the advantages that would be obtained from standardization of mechanical equipment.

Under the circumstances the Committee considers that it shall make no further endeavour to compile information in accordance with the standards adopted by the various plants, as apparently the co-operation anticipated is not forthcoming.

Your Committee has viewed various publications in connection with metal alloys used extensively in the industry, and has authorized the publication of a translation from the Italian Chemical Gazette of an article on "Special Bronzes—Lead Bronzes" by **F. Giolitti** and **M. Marantonio.** The subject of acid-resisting bronzes was further gone into, and in appendix "A" you will please find particulars as to the findings. Under "B" in the appendix you will also find various data collected regarding lead and antimony alloys. The subject of Bearing Metal is referred to under "C," but we believe that the information collected thereon is not conclusive, and we would suggest further investigation on this subject.

Your Committee has reviewed various publications in being able to report satisfactory data in connection with the flow resistance of paper stock in pipes. Although numerous tests have been made, on account of the presence of fibre, it has been impossible to keep the observing instruments clear when the consistency of stock was in excess of about 1%. Your Committee has spent considerable time in trying to perfect a method which would eliminate this trouble, and believes that the problem has been practically solved by the application of compressed air to keep free of stock all orifices of the instrument used, but unfortunately tests could not be made since the adoption of this method. We hope, however, to be able to complete these observations at a later date, and when completed purpose to publish this information in the Pulp and Paper Magazine, and we hope it will meet with your approval.

Respectfully submitted,—J. Stadler, J. O. Mason, A. P. Costigane.

A—Report on Investigation of Acid Resisting Bronze.

The present investigation covers the ordinary copper—tin—lead bronzes principally used in the chemical pulp industry.

In addition a few metal alloys, put on the market under various claims for strength and acid resisting qualities, have also been investigated.

An investigation of this nature naturally divides itself into the following parts:—The physical properties of the alloy, and its acid resisting qualities.

The Mechanical Properties of Copper-Tin-Lead Bronze

The alloys used for the investigation had the following composition:—

The Physical Properties of Copper-Tin-Lead Bronze

The alloys used for the investigation had the following composition:-

	Formula				Analysis			
	Copper	Tin	Lead	Phosphorus	Copper	Tin	Lead	Phosphor
1	90%	10%	0%	0.05%	89.92%	10.25%	0%	0.011%
2	85	10	5	0.05	84.97	10.33	4.5	0.024
3	85	5	10	0.05	84.77	5.54	9.63	0.062
4	80	10	10	0.05	79.73	10.27	9.87	0.066
5	80	5	15	0.05	81.10	5.12	13.66	0.066
6	76	9	15	0.05	75.85	9.40	14.72	0.066
7	70	15	15	0.05	70.23	15.54	14.03	0.066
8	70	10	20	0.05	71.00	9.93	19.00	0.048

Three test pieces were made from each of these alloys, with the exception of lots 4 and 5, from which four pieces were made.

The results of the physical tests given below are accordingly the mean value of three and, in two cases, four tests.

The casting of the test pieces presented considerable difficulties and, in overcoming these difficulties, a great deal of useful information applicable to foundry practice was obtained.

In the report of the Mechanical Standards Committee, submitted to the previous meeting of the Technical Section, some preliminary figures were presented on the physical properties of copper-tin-lead bronzes.

These figures are very interesting in the light of the present investigation, and, in the following discussion of the results below, references will be made to these figures.

In addition to the physical tests made, the alloys were examined under the microscope for the purpose of examination of their crystaline structure.

These microphotographs, having a magnification of 100 times their diameters, are re-produced below:—

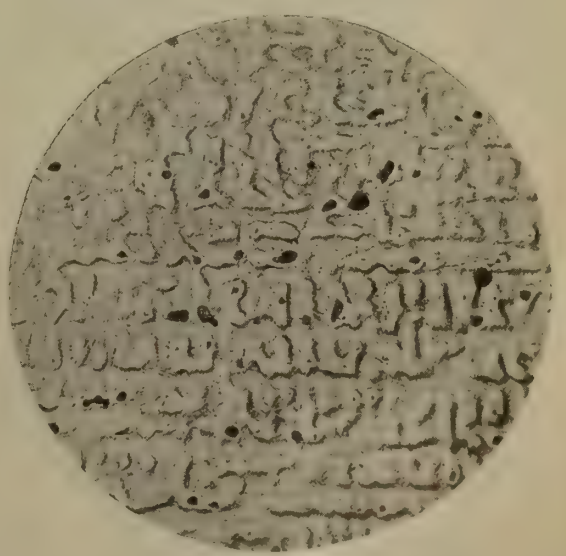


Fig. 1. Copper 90, Tin 10.—Round black spots are due to trace of lead markings; dendritic structure—same composition as balance of the metal. Note the globular form of the lead, like oil drops. It will not dissolve in the other metals.

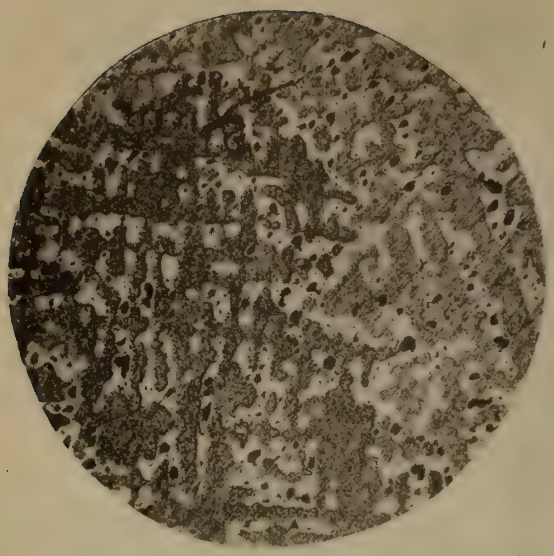


Fig. 2. Copper 85, Tin 10, Lead 5.—Shows oriented crystals, dark and light areas, dendritic forms well defined.

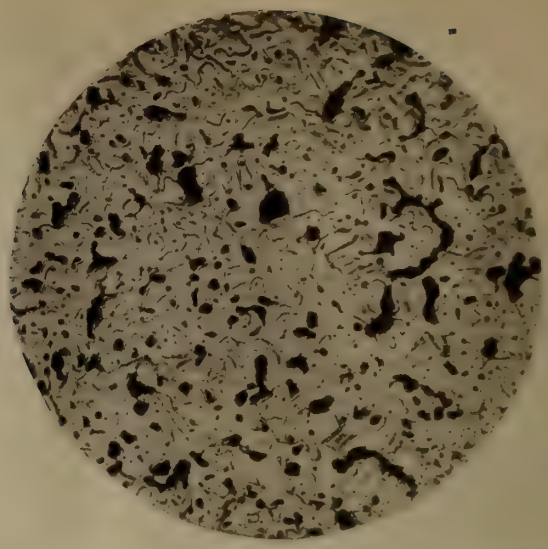


Fig. 5. Copper 80, Tin 5, Lead 15.—Shows lead lining out between the crystals. Due to increase in proportion of lead.

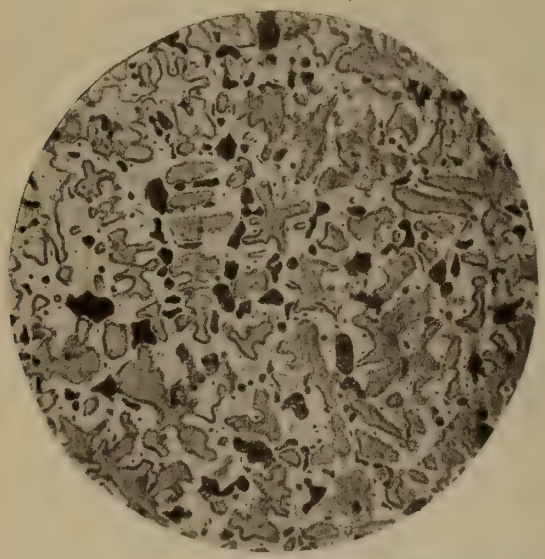


Fig. 3. Copper 85, Tin 5, Lead 10.—Black areas lead, no dross or porous spots, dendritic forms pronounced.



Fig. 6. Copper 76, Tin 9, Lead 15.—Lead dead black, and dendrites very dark and not to be confused with lead.



Fig. 4. Copper 80, Tin 10, Lead 10.—Dendritic form less marked than No. 3. Distribution of lead finer and more even.



Fig. 7. Copper 70, Tin 15, Lead 15.—Note how lead has gathered into large globules. It is segregated badly (not shown by photograph). In light areas, with a glass, the network of copper-tin eutectic is plainly visible. This alloy was most resistant to etching solution.

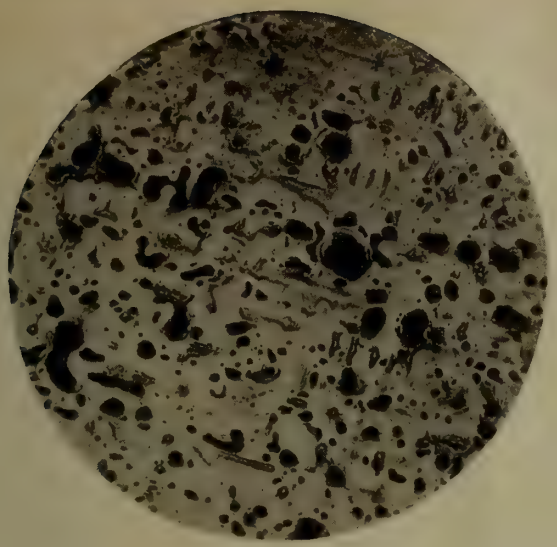


Fig. 8. Copper 71, Tin 10, Lead 19.—Lead more evenly distributed. Dendritic form again makes its appearance.

An examination of the microphotographs shows that all the alloys were made of sound metal. No oxides, dross or porous spots are found in the castings. In other words, the foundry practice has been very good.

In examining Fig. 1 round black spots are noted. These spots consist of lead globules. The lead is present in this as an impurity. It should however be noted that the lead does not unite with the copper and tin. Rather it appears throughout the alloy—up to a certain percentage—as globules resembling oil drops.

Figures 2, 3, 4, 5 and 6 show the dissemination of the lead throughout alloy.

In all these mixtures the non-tendency of the lead to unite with the copper and tin is clearly shown. The copper and tin, on the other hand, unite freely. As the proportion of lead increases, it shows the increasing tendency to separate into larger globules.

In Fig. 5, the lead has increased so that this metal

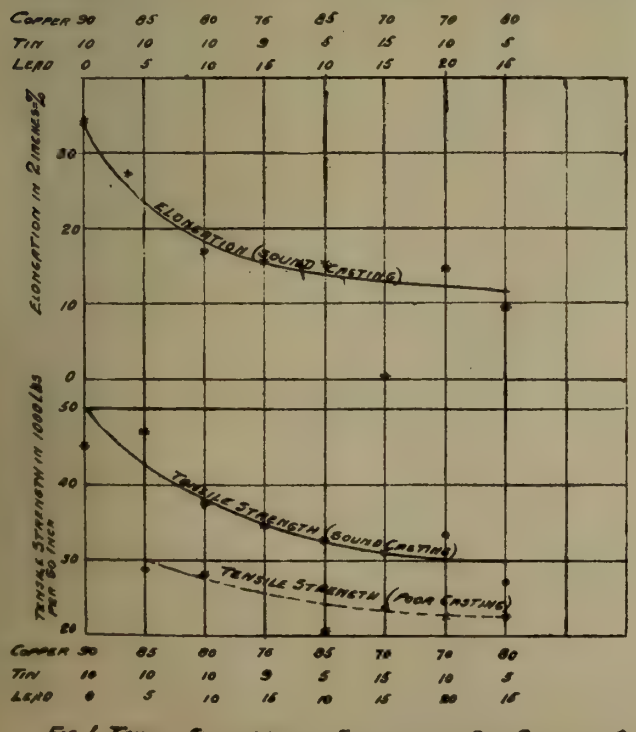


FIG. 1 TENSILE STRENGTH AND ELONGATION OF ACID RESISTING BRONZE

Graph 1.

begins to line out between the crystals. Finally, in Fig. 7, containing 15% lead, a very bad segregation of the lead is noticed. This is a most important feature of the alloy containing lead from 15% and up.

Examined with a magnifying glass the network of Cu_3 Sn is plainly visible. This chemical compound of copper and tin does not show where the percentage of tin is below 10%.

In Fig. 8 a better distribution of the lead is shown. It should be noticed that this is due to an increased rate of solidification, an important feature which will be discussed later.

The physical tests were made in accordance with the test code of the American Society for Testing Materials and included tensile strength, yield point, elongation and reduction of area. In addition, hardness tests were made by means of a Shore scleroscope.

Table No. 1 gives the results of these tests, omitting the yield point and reduction of area as being of less interest.

Table No. 2 gives the results of the tests made for the preliminary report. (See Pulp & Paper, p. 134, 1920).

The mean value of the figures in the tables are shown in graphical form in Graphs 1 and 2.

TABLE NO. 1.

Alloy No.		Composition Cu-Sn-Pb	Tensile strength lbs. per sq. inch	Elongation per cent	Hardness Shore Scale
1	a	90-10	44,650	36.6	10
	b		44,650	30·0	
	c		44,700	36·0	
2	a	85-10-5	39,250	16·0(1)	10·5
	b		46,100	29·0	10·5
	c		47,350	36·0	
3	a	85-5-10	31,750	12·0	8·5
	b		33,850	12.0	
	c		32,800	22·5	
4	a	80-10-10	34,050	9·5(2)	10
	b		37,450	16.0	
	c		36,650	18·0	
	d		41,300	24·0	
5	a	80-5-15	28,300	16·2	7·2
	b		27,100	10·1	
	c		24,450	9·2	
	d		26,000	14·6	
6	a	76-9-15	34,000	13·4	10·2
	b		35,000	18·0	
	c		34,350	19·4	
7	a	70-15-15	31,000	none	17·5
	b		31,000	none	
	c		31,250	none	
8	a	70-10-20	32,300	20·1	10
	b		34,400	21·7	
	c		35,200	20·1	

Note—(1) Small dross spot, (2) slight flaw.

TABLE NO. 2.

Alloy No.	Composition	Tensile strength per sq. inch
1	85-10-5	28,706
2	85 5-10	20,427
3	80-10-10	28,150
4	80- 5-15	22,810
5	70-15-15	24,630
6	70-10-20	22,985

Along the abscissa on Graph No. 1 the composition of the various alloys has been arranged so as to show the effect of the increasing amounts of lead on the strength and ductility of the alloy, while Graph No. 2 shows the effect of decreasing amounts of tin on the hardness of the alloy.

An examination of these graphs reveals facts of great interest, and the conclusions to be drawn should be of considerable value to the users of acid resisting bronze.

In the first place, it is evident that, by increasing the tin (up to 20%), an alloy of great strength and hardness is obtained. Note that alloys Nos. 1 and 2 have a tensile strength nearly as great as that of soft steel.

Alloy No. 1, containing no lead, is however very hard to cast, and it was found to be very difficult to obtain sound castings.

The addition of a small percentage of lead greatly eliminated this troublesome feature, and, as shown by the curves in graph No. 1, up to 5% lead the strength and ductility are not greatly affected.

Beyond 5% lead, however, the strength of the alloy decreases rapidly, and it becomes also very brittle. No. 7 for instance, containing 15% tin, shows no elongation whatever.

Graph No. 2 demonstrates the fact that the tin is the element principally influencing the hardness of the alloy. Alloy No. 7, in spite of the presence of a high percentage of lead, has the greatest hardness. The general conception that lead makes the alloy soft therefore does not seem to be borne out by the investigation. That lead cannot have a very great influence on the hardness is furthermore evident from examination of the microphotographs.

The lead does not amalgamate with the other metals, but appears, when the percentage is sufficiently high, as solid masses of solidified lead in metal.

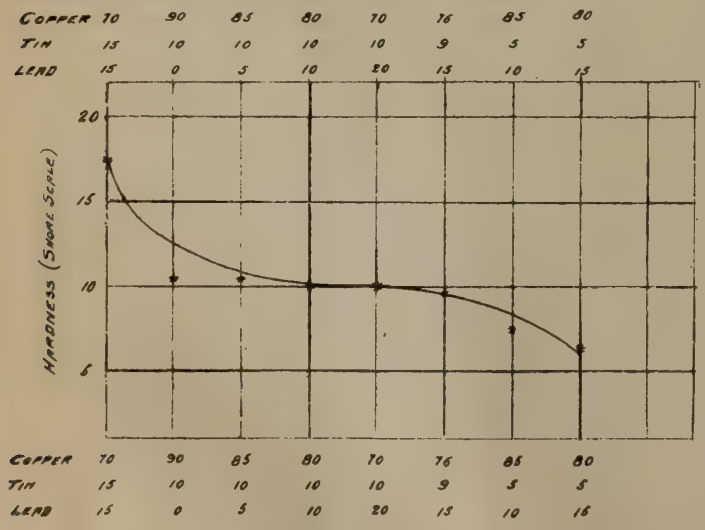


Fig. 2 Hardness of Acid Resisting Bronze

Graph 2.

The dotted curve in Graph 1 shows the strength of the various alloys obtained from a certain foundry, and represents extremely poor foundry practice. It will be noted that the tensile strengths of these castings are over 10,000 lbs. less than that for the sound castings.

This fact is further brought out by the tests made on a test piece taken from a bronze digester sleeve which had given very poor service, and which had to be removed after a short time. The results of this test show:—

Composition—Copper 85%, tin 10%, lead 5%; tensile strength lbs. per sq. inch, 19,387; elongation in two inches 3·5%.

This casting was very porous and spongy, which of course accounts for its poor wearing qualities, also the extreme brittleness of this casting. Fig. 9 shows the structure of the test pieces. It is extremely porous and contains blow holes over the entire surface. This condition is due to defects in the foundry practice.

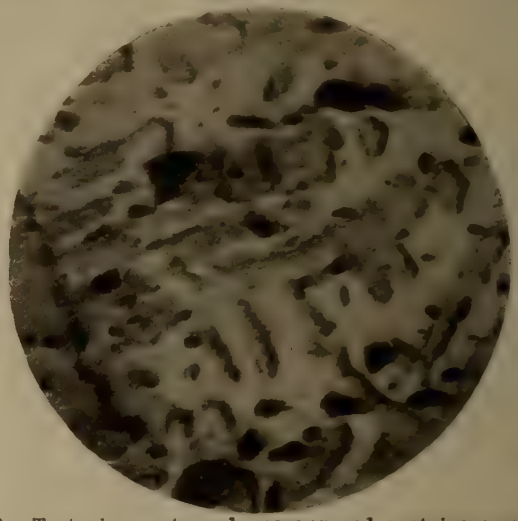


Fig. 9.—Test piece extremely porous and contains small blow holes over entire surface.

The acid resisting qualities of the bronzes.

The present investigation has established the fact that little or no conclusions can be drawn from laboratory tests as to which alloy best resists the action of sulphite liquor.

The different alloys have also been exposed to this action in a sulphite digester during a considerable period. In presenting the results of this test for what they are worth (table 3), it is recommended that fittings of various composition be tested under actual operating conditions and accurate records kept to show the performance.

Table 3 shows, however, that the increased content of lead in the alloy has no very appreciable effect on its acid resisting qualities.

TABLE No. 3.

Alloy No.	Composition Copper	Tin	Lead	% loss in weight after 3 weeks exposure in Sulphite Digester
1	90	10	0	9·9
2	85	10	5	10·5
3	85	5	10	8·9
44	80	10	10	12.1
5	80	5	15	8·5
6	76	9	15	11·7
7	70	15	20	12
8	70	10	15	11·7

Conclusion.

The present investigation has brought out the great importance of a good foundry practice. No matter what the composition of the alloy is, with poor foundry practice, the required strength, ductility or toughness and hardness is not obtained.

It should therefore be insisted on that all castings be free from flaws, dross, porous spots, and the surfaces free from scale, sand or loam.

Castings which do not meet these requirements should therfore be rejected.

As to the composition of the alloy, it is apparent that an increase in lead above 5% does not fulfil any useful purpose. The strength and toughness rapidly decrease while, as far as can be concluded from the present tests, the acid resisting qualities are not materially affected.

Any effect of this constituent is probably due to the fact that the presence of a high percentage of lead makes it very difficult to obtain a sound casting, with the result that acid eats its way into the interior of the casting, quickly disintegrating it.

The addition of tin, up to 20%, on the other hand, gives an alloy possessing great strength and hardness.

It should be noted, however, that an alloy containing over 10% tin has a very complex freezing point curve; between 10 to 20% there being no less than three distinct freezing points.

In its practical application this means that such an alloy solidifies in three separate portions, thus accelerating the tendency to segregation with the consequennt decrease in strength and ductility.

The presence of phosphorus in the bronze, up to 0·1%, has a very marked effect upon its properties, greatly increasing its strength and toughness and also notably facilitating the founding. It is therefore recommended that in any specification for bronze the presence of not less than 0·05% phosphorus should be insisted on.

In taking the points brought out by the present investigation into consideration, the suggested specification for acid resisting bronze will then be as follows:

Copper	84½ — 85 %
Tin	9½ — 10½%
Lead	4½ — 5½%
Phosphorous not less than	0·05%
Impurities not more than	0· 5%

Addenda.

In addition to the above, a few acid resisting metals, sold under trade names, have been investigated.

Of these metals, two, "Aterite" and "Meco," have a very similar chemical composition.

They are both alloys, containing chiefly copper, nickel, zinc with a small addition of lead, silicon and iron. Of the two "Meco" is the higher in copper, while "Aterite" is the higher in nickel. "Aterite," as a matter of fact, appears very similar in composition to Monel metal.

Both metals have a very satisfactory tensile strength —40,000 lbs. per sq. inch—and the hardness ranges from 25—30 points (Shore scale).

The exposure of these metals to moist SO_2-gas shows that they are both affected to some degree. "Aterite" lost during an exposure equivalent to 31 days 2·5% in weight, while in the same period "Meco" lost 1%.

Both metals therefore appear to possess notable acid resisting qualities.

At the present time, however, the market price of these metals does not allow them to compete with the copper-tin-lead alloys.

The third metal investigated is sold under the name of "Promet Bronze." It is a copper-zinc alloy, with a tensile strength of 40,000 lbs. per sq. inch, an elongation of 48%, and a hardness equal to 10 points. It is a very strong and tough alloy, but, owing to its high content of zinc, is hardly suitable for sulphite mill work.

B—Report on Investigation of Antimonial Lead.

This investigation was made for the purpose of ascertaining the most suitable composition of antimonial lead used in the chemical pulp industry.

The questionnaire sent out by the Committee on Mechanical Standards brought out the fact that there is a great diversity of opinion among the different mills in regard to this composition. Some mills advocate lead with as little as 2% antimony, while others favor a lead alloy containing 15% antimony.

It is therefore apparent that an investigation of the physical properties of antimonial lead alloys should be of considerable interest to the members of the Technical Section.

Preliminary to carrying out the physical tests, a great deal of experimenting was done to obtain homogeneous test pieces. Chemical analysis showed that the antimony has a great tendency to segregate from the lead in mixtures containing over 13·5% antimony.

This is particularly the case when the rate of solidification is slow. The test pieces, finally used for the testing, were carefully analysed and were found to be sufficiently homogeneous The test pieces contained antimony in proportions varying from 2.5% to 17.8%.

On each of these alloys the following tests were made—tensile, compressive and transverse strength; elongation; reduction of area and hardness.

The tensile strength, elongation and reduction of area were determined on test pieces of the usual half inch cross section, and are given in lbs. per square inch.

The compressive tests were made on cylinders having a height equal to 2 diameters, and are given in lbs. per square inch.

The transverse tests were made on 1" square bars, supported 8" apart. The hardness tests are expressed in points of the Shore scale.

The results of the tests are given in Table No. 1, and these figures representing the mean value of, in some instances, three tests, are presented in graphical form in Diagrams 1, 2 and 3.

In the table the figures giving the reduction of area have been omitted as being of less interest.

Physical Properties of Antimonial Lead:

Test Piece No.	Composition Sb	Pb	Transverse Test (1)	Max. Load	Tensile Strength	% Elongation	Compressive Strength (1)	Hardness
1	2.8	97.2	257	746	3696	35	3084	1.7
2	5.5	94.5	615	1065	3610	30	2664	2.1
3	7.5	92.5	777	1150	4810	30	6174	2.4
4	10.00	90.0	527	1386	7240	18	8838	2.9
5	11.95	88.05	944	1442	8000	20	7250	2.9
6	12.76	87.24	815	1442	7653	14.5	6978	2.6
7	14.10	85.90	-	-	5344	4.5	8050	2.6
8	14.93	85.07	1007	1636	-	6.0	-	2.8
9	15.93	84.07	1052	1605	6456	4.5	7870	2.6
10	17.49	82.51	1302	1538	6759	3.0	9170	2.6

(1) To elastic limit

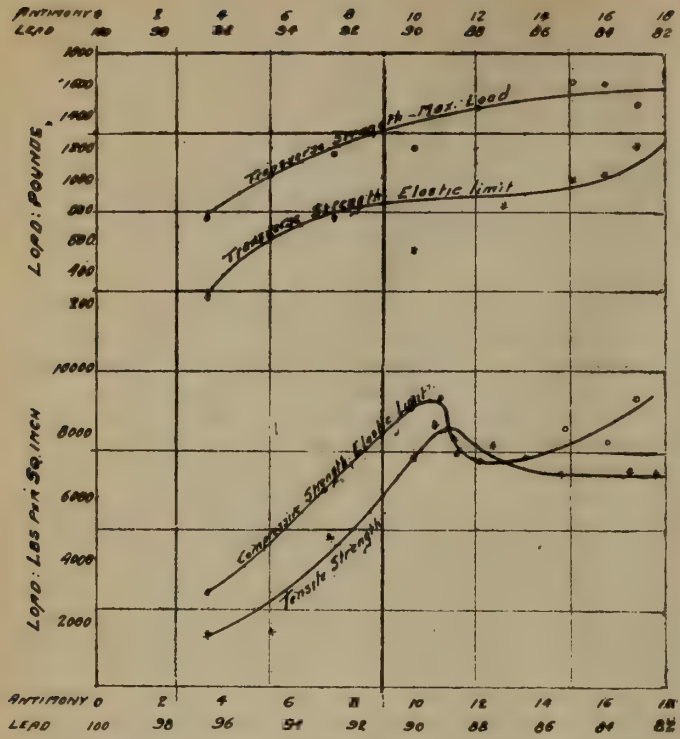


Diagram 1.—Tensile, compressive, and transverse strengths of antimonial lead.

Diag. 1 shows graphically the tensile, compressive, and transverse strength, and Diag. 2 the elongation and hardness of the various mixtures.

Diag. 3 shows diagramatically how the test bars stand bending, the curved lines representing the bending of the bars at the point of failure.

An examination of the diagrams reveals some very interesting information.

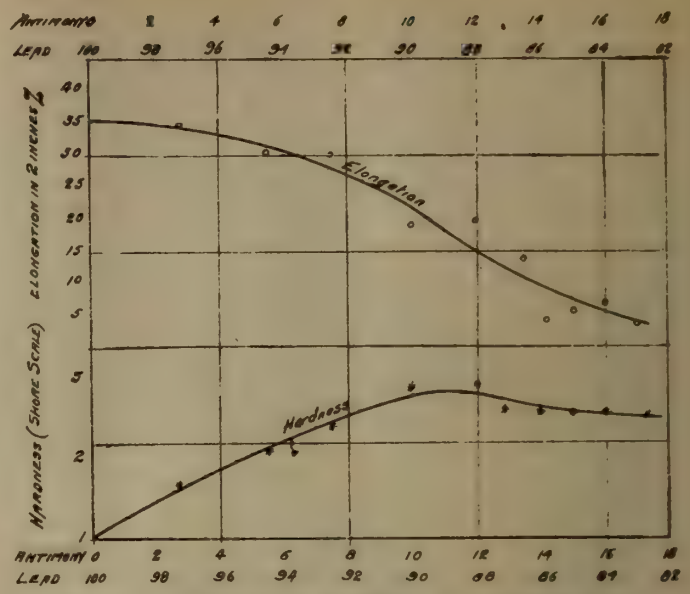


Diagram 2.—Hardness and elongation of antimonial lead.

The tensile strength and the elongation increase with the addition of antimony up to 11%.

Above 11% the strength rapidly decreases, and above 13% the metal becomes very brittle.

The compressive strength also increases up to about 11% antimony; beyond this percentage, it shows an extreme irregularity. It should be remarked that compressive tests were made on cylinders compressd to one half of their height. In many of the specimens containing a higher per cent of antimony, however, the test pieces partially broke along several cleavage planes in a crumbling way. These tests have therefore been omitted in the table as not representing the maximum load to one half the height.

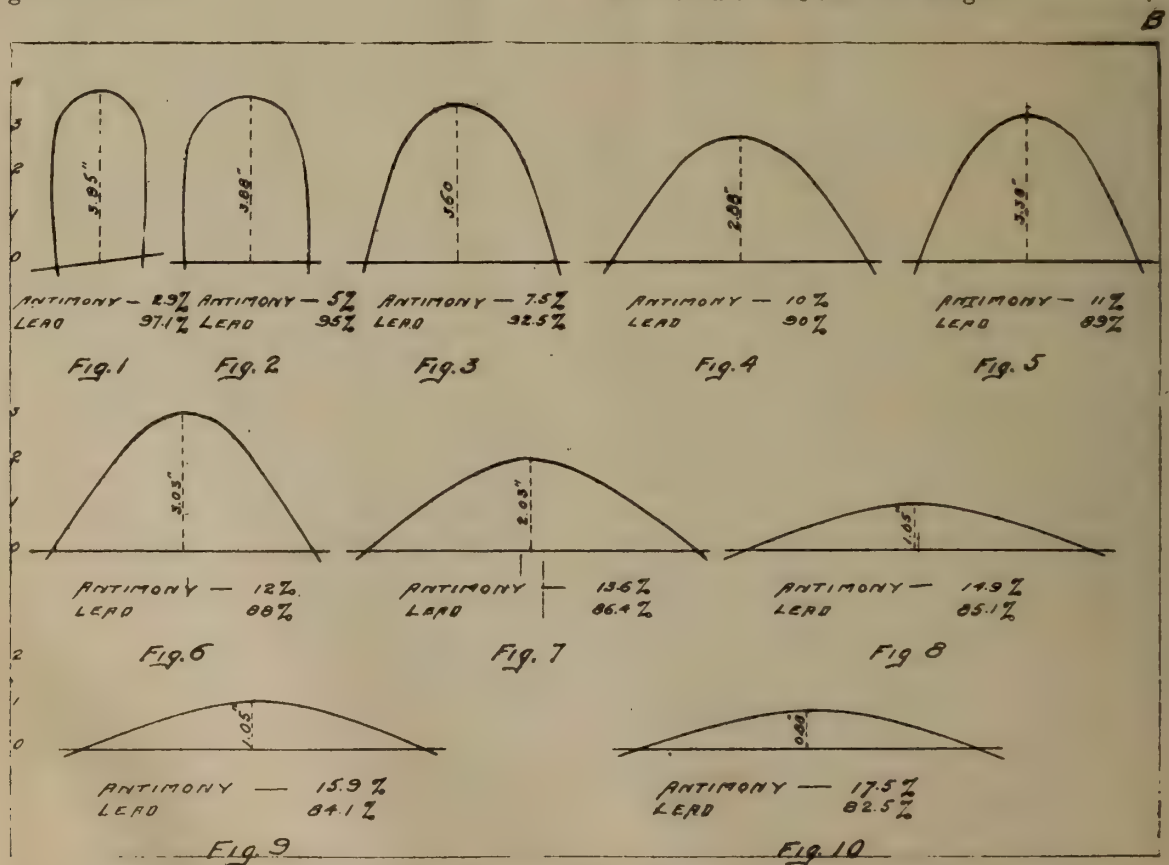


Diagram 3.—Antimonial lead alloys: Transverse tests of 1 in. square bars, supports 8 ins. apart. Curves show amount of bending where failure occurred.

The maximum transverse load represents the pressure at which the bars failed.

It was attained shortly after the elastic limit had been reached.

The hardness tests show a considerable variation above 10% antimony. When it is remembered, however, that above 13·5 antimony the alloy consists of hard antimony crystals imbedded in a softer lead-antimony eutectic, it appears quite natural that a uniform hardness cannot be expected.

Conclusion.

As antimonial lead is used principally for lead piping, the physical requirements of this will naturally be the governing factors in determining the composition to be used.

The requirements of a lead pipe is that it does not collapse under its own weight, and that it does not sag, creep or bend under exposure to the pressure and temperature of the digester relief gases.

On the other hand, it should withstand the blow of a heavy object and, if bent, it should not break. In other words, it should not be brittle.

A study of diagrams 1, 2 and 3 indicates that the alloy containing 10 to 11% antimony best fills these conditions. Below 10% of antimony the tensile and compressive strength of the alloy decrease rapidly and while more plastic it is very soft. By an addition of more than 11% antimony, on the other hand, no advantage is gained, as above this percentage the alloy becomes rapidly brittle. It is furthermore extremely difficult to obtain homogeneous castings with antimony present in proportions above this percentage.

The investigation has braought out the fact that good foundry practice is necessary in order to obtain a homogeneous alloy, and it is therefore recommended that the necessary chemical and physical tests be included in the specification for antimonial lead.

C—Report on Investgation of Bearing Metals.

The investigation covered in this report is hardly more than preliminary, inasmuch as a subject of this magnitude requires a good deal more time than has been at our disposal.

A rather extensive search of the technical literature has been made for the purpose of finding out what has been done to standardize the bearing metals used for various duties.

It appears, however, that little or nothing is to be found, except what has been published by some of the railroads.

One most important fact has been brought out in regard to white bearing metals, namely that Babbitts with a high per cent tin have been entirely superceded by alloys containing chiefly lead and antimony.

The following formula is given as an example of the composition generally in vogue some years ago:—

Tin	80%
Antimony	10%
Copper	10%

This Babbitt has now been discarded by some of the largest railroads in America for a Babbitt, used for all general purposes, with the following composition:—

Tin, not below	6½%
Copper	½ to ¾%
Antimony	14—16%
Lead	77—79%
Phosphorous	0·025—0·110%
Total impurities including zinc, iron, etc.	under 0·5%

This Babbitt is also used in bearings for electric motors under 5 H.P. in size.

Another metal, containing less copper and a somewhat higher percentage of antimony, and appearing under the name of Zero metal, has the following composition:—

Tin	6·14%
Copper	·10%
Antimony	18·53%
Lead	75·23%

The present investigation has been confined to white metal alloys. It has consisted in an investigation of the physical characteristics of two Babbitts which, according to the returned questionnaires of the Mechanical Standards Committee, seem to be extensively used by some of the mills.

In addition, three metals, thought to be of considerable interest, have been similarly investigated. These metals appear on the market under trade names and are not sold on an analysis basis.

The results of these tests together with the composition of the metals is given in table No. 1.

The factors chiefly influencing the selection of a bearing metal are, its antifriction properties, wearing qualities, and price.

Of these three factors, the first two can only be determined through actual tests under actual operating conditions.

The third factor, price, is of course of considerable importance.

TABLE 1—Physical Characteristics of a unmber of Bearing Metals:

Name	Composition					Hardness	Tensile Strength		Compressive strength	
	Copper %	Tin %	Anti-mony %	Lead %	Arse-nic %	Shore scale	Tensile strength	Elonga-tion %	Elastic limit	To ½ original height
Babbit #1	1.0	60.0	8.9	30.1		2.86	9450	10.0	4615	12438
							9622	15.8	6446	12154
Babbit #2	2.0	44.5	9.0	44.5		2.78	7281	2.5	6585	9631
							7675	3.5	7015	9714
Promet "Genuine"	0.25	0.47	13.49	84.9	0.89	3.24	8546	5.0	4080	22945
							7730	2.5	4621	21060
Promet "X X"	0.25	0.38	13.58	84.60	1.19	3.29	8674	2.5	7040	20730
							8036	3.5	6552	21983
Frary Metal (1)	-	-	-	99.8	-	4.39	13327	14.5	6115	14462
							15295	13.5	5308	11080

(1) Barium = 0.82 %
Calcium = 0.12 %

It is therefore thought that it would be of interest to give the relative cost of the bearing metals investigated. These costs are given in table No. 2, and they are based on the present market price of the metals of which they are composed.

The prices of the metals constituting the alloys as quoted by Canadian manufacturers or wholesalers during the month of December, 1920, were as follows:—

Copper	Lb.	$0·18½
Tin	"	0·50
Antimony	"	0·09
Lead	"	0·09½
Arsenic	"	0·12

The physical characteristics given in table No. 1 are very interesting.

Alloys Nos. 1 and 2 show good compressive strength, although No. 2 appears to be a good deal more brittle than No. 1. This resistance to pressure, one of the most important of the qualities of a bearing metal, is due to the presence of antimony.

The two alloys called Promet "Genuine" and "XX," although very low in tin, have a remarkably high tensile strength. Except for the presence of arsenic in these alloys, they appear to be very similar in composition with the railroad standard bearing metals. This presence of arsenic should be particularly noted. Together with antimony, it raises the resistance to pressure remarkably.

At the same time, it should be noted however, it makes the alloy very brittle, as is shown in the low elongation of the Promet metals.

The last of the series, the metal called "Frary Metal," is one of the most interesting alloys appearing in recent years. It was developed in the United States during the war. As is shown in the analysis given in the table, it contains lead with a very small addition of metallic calcium and barium. This presence of small quantities of alkaline earth metals has completely changed the properties of the lead. Note its extreme hardness and high tensile strength. Although not quite so high in resistance to compression as Promet metals, it has an elongation more than four times that of the latter. It therefore has none of the brittleness of antimonial lead.

Tests made by the United States Bureau of Standards showed that a bearing made up of this metal, running under a load of 1000 lbs. per square inch, at a speed of 400 R.P.M., was still in good condition after 23,200 revolutions, while a genuine Babbitt bearing, running under a load of 400 lbs per square inch, at 600 R.P.M., seized and began smoking after only 6.600 revolutions.

Table No. 2, taken in conjunction with table No.1, shows pretty clearly that the strength, according to the wearing qualities, of the lead-antimony-tin alloys increases with the antimony, while the price increases with the tin. In general it can be said that the bearing metals mostly used are unnecessarily expensive. They too often contain higher percentages of high priced metals than is really required, a fact which, it may be mentioned, was borne out by the experience of European machine builders during the war, when cheaper substitutes had to be used.

It is apparent that there is a great deal to be done along the lines of investigations of the properties of bearing metals, particularly in regard to many of the metals, such as the alkaline earths, magnesium, etc., which have recently been applied to the manufacture of bearing metals.

A good deal of work could furthermore be profitably expended on the standardization of the alloys at hand.

TABLE 2—Metallic Value of a number of Bearing Metals:

Name of Alloy	Composition					Metallic Value
	Copper %	Tin %	Antimony %	Lead %	Arsenic %	Cents per lb.
Genuine Babbit	10	80	10			42.75
Babbit #1 (1)	1.0	60	8.9	30.1		33.79
Babbit #2 (1)	2.0	44.5	9.0	44.5		27.65
Railway Standard	0.5	6.5	16.5	76.5		12.08
Zero Metal	0.1	6.14	18.53	75.23		12.91
Promet "G"	0.25	0.47	13.49	84.9	0.89	9.67
Promet " X X "	0.25	0.38	13.58	84.6	1.19	9.64
Frary Metal (2)	-	-	-	99.8	-	9.48 (3)

(1) Babbit used in Pulp & Paper Mills - See table #1.

(2) Barium = 0.82 %
Calcium = 0.12 %

(3) The prices of Barium and Calcium are not included.

COMMITTEE ON CHEMICAL STANDARDS.

The Committee on Chemical Standards wishes to submit the following report for the consideration of the Technical Section:

Strength of Sulphite Pulp.

Your committee has reviewed the report of the committee presented on January 30th, 1919, by Messrs. Decew, Hovey, Cooper and Mason, and has no suggestions or alterations to make in reference to the methods in the report. Through correspondence with different laboratories we have discovered that the present ball mill method for measuring strength of sulphite does not give comparable results when performed by different operators. This leads us to believe that the method produces results which may be considered more directly as a measurement of the effect of beating than as a true determination of sulphite strength. It is our recommendation that this particular question be referred to a committee on sulphite pulp for consideration, and that this committee be requested to consider the subject in its broad aspect and endeavor by co-operation with different mill laboratories to develop a method which will give a true indication on the actual strength of sulphite pulp.

Coal Tar Dye Stuffs.

Your Committee has made several examinations into the various coal tar dye stuffs marketed in Canada. The differences in quality in dye stuffs sold under the same name has been particularly noticeable, and it is the recommendation of your committee that a special committee be appointed to completely review and carefully study the entire question of dye stuffs in relation to their use in paper manufacture.

Paper.

This committee would recommend to the consideration of the Association a detailed study of methods which can be presented for adoption as standard for grading of news print and wrapping papers. We would recommend development of this study with the idea of making a report of quality on a definite percentage basis. We believe that each of the following factors should be considered:—Weight, finish, cleanliness, strength, formation, thickness, color and moisture.

In the opinion of the committee it appears reasonable that a definite value can be derived which will represent 100%, and that this value can be preserved in the form of comparison standards where such standards are needed. Working from these standards the percentage value of each individual factor may be determined, e.g., the paper may have a formation of 90%, finish of 85%, and cleanliness of 60%, etc. The committee would further recommend that weighted values be assigned to each quality factor, to the end that final numerical quality percentage may be determined and percentage value representing the actual value of the paper.

Evaluation of Clay Filler.

WATER.—Ignite 2 grams of the clay in a porcelain crucible at red heat. The loss in weight X 50 = per cent of free and combined water.

COLOR.—The comparison of different clays for color or whiteness should be carried out with both the dry and the wet clay. The dry clays should be placed side by side on a porcelain slab for examination and comparison with mill standards. The wet clays should be made up with water to the consistency of a thick paste and compared in the same manner.

FINENESS.—Fineness should be measured by mixing a 20 gram sample with water, rubbing up in a mortar and straining through a 100 mesh sieve. The residue remaining shall be dried and weighed.

ELUTRIATION.—Weigh 2 grams of the sample into a Nobel or Schultze elutriating apparatus and continue flow of water at a rate not to exceed 20 c.c. per minute until an effluent from the last reservoir is free from the suspended material. Filter, dry and weigh the residue in each reservoir separately.

ALTERNATIVE METHODS.—Weigh a 2 gram sample into a 2 meter round bottom flask and introduce water through a 5 m.m. tube just touching the bottom of the flask. At a rate not greater than 20 c.c. per minute continue flowage until the effluent is free from suspended particles. Filter, wash, dry the residue in the flask.

PLASTICITY.—Make up a thin starch paste by boiling 1 gram of starch in a litre of water. Place 100 c.c. of this paste together with 5 grams of the sample of clay in a graduated glass and shake well. Allow to stand at rest for 24 hours. The finer and more plastic the clay, the greater its miscibility with the starch paste, i.e., the less it settles to the bottom of the vessel. Various samples may be compared in this way.

Respectfully submitted,

A. G. DURGIN, *Chairman.*

COMMITTEE ON EDUCATION.

Text Books.

Your committee has continued to give much co-operation with the Joint Executive Committee on Text Books. This has consisted in the reading over of manuscripts and conferences with the Editor, Chairman and Secretary. On two occasions since our last annual report, your committee has met the Committee on Education of the T. A. P. P. I. full session at New York in April, and at Saratoga in September. We are pleased to report the great singleness of purpose and unanimity has characterized these meetings, and that throughout the industry the greatest interest is being maintained in the production of text books.

Efforts have been concentrated on Volume I, containing Arithmetic, Elementary Applied Mechanics, How to Read Drawings, and Elementary Physics, in order to produce specimens for this meeting. Volume II. will contain the other preliminary matter, Mechanics, Hydraulic, Elements of Electricity, and Elementary Chemistry. The work for this volume is all in the printer's hands. The issuance of the preliminary matter in two volumes will make the complete set five volumes instead of four.

To expedite matters, it has been found advisable to engage a draftsman conversant with the industry to assist the editor in preparing matter for illustrations. A good man has been engaged to work at Ste. Annes, and it has been found possible to reduce the staff at Scranton by one.

As an illustration of the manner of preparing the manuscript, we might cite the section on the paper machine. This manuscript was prepared by Mr. Brassington and passed on by the Editor to two groups of mill superintendents. The first group was that of superintendent in the Niagara Peninsula, representing sulphite, news, book, writing, tissues, and light wrappings. These gentlemen, with members of your com-

mittee, took one evening to look through the manuscript, then divided it among them for critical reading, and after two weeks had another meeting, exchanging criticisms. This resulted in many useful suggestions, a better statement of some points and the correction of errors that could only be noted by men of lifelong practical experience. The manuscript is now in the hands of a similar group in the neighbourhood of Holyoke, Mass.

The Editor, Mr. Stephenson, is a member of this committee, but his fellow members feel it will not be amiss to say that he has labored long, patiently and effectively, and that the industry, as a whole, is greatly indebted to him and his editorial colleagues, Messrs. Foster and Clark.

Student Work.

Members of your committee have addressed students at McGill and Toronto Universities on the general principles of the industry. During the vacation season of 1920, some sixty students of Canadian Universities were employed in the mills. This is just twice the number for 1919, and is a very good evidence of the interest of our universities and students in the industry, and also indicates that the mills appreciate the possibility of growing good stock for technical staffs. Fourteen essays of high literary and technical excellence were entered in the competition.

The thanks of this committee are given to the mills whose co-operation makes this effort possible, and to Mr. Dawe, who has done nearly all the work incidental to putting the universities in touch with the mills.

Respectfully submitted—Geo. Carruthers, A. P. Costigane, D. Daverin, C. N. Gain, J. N. Stephenson, T. Linsey Crossley, Chairman.

COMMITTEE ON TESTING MOISTURE IN PULP.

Your committee beg to report the following:

1. The only pulp on which your committee have recommended no decided methods for testing are Dry Pulp in rolls and Dry Pulp made into sheets and then pressed into bales.

2. Your committee have previously pointed out three methods that are in use in testing same, namely:

   1. The Strip Method.
   2. The Disc Method.
   3. The Wedge System as used in Great Britain and Scandinavia.

Your committee feel that inasmuch as these three methods are standards in themselves it is mainly a question as to which one is most suitable to be used, depending on conditions under which tests are taken. Your committee have noticed that both the American and English Technical Sections are working on these problems, and have not as yet decided which method is most suitable.

Your committee feel that a committee should be composed from these three different Associations and have power to decide as to which of above methods, or if all three, should be used in matters of testing dry pulp in rolls or bales.

E. B. SLACK, Chairman.

Canadian Fairbanks-Morse, Ltd. extend a cordial invitation to all pulp and paper men to visit their extensive show rooms at 84 St. Antoine St., a few doors east of Windsor Station.

Hydraulic Machinery Co., Dominion Engineering Works, and other concerns in the trade also extend a welcome to visitors.

COMMITTEE ON ABSTRACTS AND PUBLICATIONS.

Your committee reports having been at work continually since the last meeting. An optimist might call it a progress report. We have arranged for the abstracting British Journals by the Librarian of the Spanish River Pulp and Paper Mills at Sault Ste. Marie. Several tentative arrangements for an abstractor to take care of Swedish and Norwegian journals have so far been without result and we are now endeavoring to make arrangements for these periodicals.

Our co-operation of the American Committee continues, and Mr. C. J. West of the A. D. Little, Inc., is doing most of the abstracting across the line.

We hope during the coming year to arrange for better service with regard to reviews of books relating to the industry.

In the issue of the Pulp and Paper Magazine for December 16th, there is an article by Miss A. B. Collins, Librarian of the Spanish River Pulp and Paper Mills, on "How a Paper Mill Uses the Literature." Appended to Miss Collins' article is a revised classification of the literature according to the plan worked out some years ago by your committee. Respectfully submitted—O. F. Bryant, R. L. Campbell, S. Wang, J. N. Stephenson, Chairman.

126 Ft. PAPER BELT AROUND THE WORLD.

According to the Spanish River News, a newsprint mill using 150,000 cords of wood annually, would furnish the following interesting data:

Wood.

150,000 cords of wood used per year.

Wood used in one year placed end to end and average size 7 inches diameter, would reach one half way around the world.

It would require 10,000 railroad cars to carry this wood, these cars would make one train 80 miles long of 200 trains of 50 cars each.

This wood piled in standard cords 4'x4'x8' and placed end to end would make a pile 227 miles long.

About 220 sq. miles of land is cut over and found unfit for wood each year.

Newsprint.

The area of paper made per day is 46,846,832 sq. ft. and in one year 14,522,517,920 sq. ft., this is equal to 1075 acres per day and 333,391 acres per year, or 1.5 sq. miles per day and 521 sq. miles per year.

All paper cut into a strip one inch wide would reach 4.4 times around the world each day and 1,368 times in one year.

The paper cut into standard roll widths of 72 inches would reach from Montreal to Winnipeg each day and around the world in 28 days or 12 times a year. One year's run would make a belt around the world 126 ft. wide.

If all the newsprint in one day was cut into 72 inch rolls and these rolls placed on end, side by side, they would completely over a tennis court inside the lines. In one year stacking each day's run on top of the others, on the tennis court we would have a pile over one quarter of a mile high.

If all these rolls were placed one on top of the other end for end the pile would reach one half mile high in one day and 150 miles high in one year.

What makes the artificial limb manufacturers rich? Careless workers. Get together, men, and put them out of business.

PULP AND PAPER NEWS

The English River timber limit is now off the Ontario Government's hands. Last week E. W. Backus, the American pulp magnate walked out of the Parliament buildings with the last contract completed between himself and the Drury Government. The consideration for the 2,500 square miles of pulpwood lands in the Rainy River district near Kenora, is $50,100 and the regulation dues.

Lieut.-Col. Thomas Gibson, Vice-President, and J. G. Gibson, Secretary of the Spanish River Pulp and Paper Mills, Limited, have returned to Toronto after attending the annual president's banquet of the company at Sault Ste. Marie, Ont., when addresses were given by Hon. Beniah Bowman, Hon. G. D. Robertson, President George H. Mead Lieut. Col. Gibson and others. A feature of the gathering was the address of Col. Gibson, who, in addition to being the vice-president, is the company's legal adviser. Col. Gibson reviewed the history of the company from its inception to its present status as one of the largest industries in the Dominion. It was pointed out that the first mill was built by E. H. Clergue in 1894, which was a ground wood mill, having a capacity of 100 tons a day. In 1901 a sulphite mill was built at the Soo with a capacity of eight tons a day. Today the new ground wood and sulphite mills are perhaps the finest in the world. The present production of the company's various mills is 625 tons of newsprint, 500 tons of ground wood, 230 tons of sulphite and 40 tons of board daily, which represents 20 per cent of Canada's production and 8 per cent of the production of the American continent. The banquet was the culmination of the annual conference between the management of the company and the heads of departments from each of the three mills, Sault Ste. Marie, Espanola and Sturgeon Falls.

Mr. W. F. Christie, of John Christie & Co., paper stock dealers. Adelaide Street, Toronto, has gone on a business trip to some of the American mills.

Mr. H. W. Guettler, of Chicago, President of the Canadian Barking Drum Company and Fibre Making Processes, was in Toronto this week calling on the Toronto office of the company in the Royal Bank Building. While in Montreal he called at the office of the Pulp and Paper Magazine.

The Canadian and Chicago offices of the Canadian Barking Drum Company have installed a barking drum equipment in the new plant at Sorel, Que., of J. H. Dansereau. Machines have also been sold recently to the Ontario Paper Company, at Thorold: the J. & J. Rogers Company of Ausable Falls, N. Y. and the Union Bag and Paper Company at Cheyboygan, Mich.

The capital stock of the Spectator Printing Company, Limited, of Hamilton, Ont., has been increased from $20,000 to $500,000 by the creation of 4,800 shares of $100 each.

Mr. R. H. Bryan, of the Brompton Paper Company, was in Toronto during the week on one of his regular business trips.

Mr. C. R. Whitehead, President of the Wayagamack Pulp and Paper Company, Limited, sailed a few days ago for England on a business trip. Mr. Sherriff, of the Hodge-Sherriff Paper Co., Ltd., selling agents for the Wayagamack people, is still in England.

The wrapping paper manufacturers will hold a meeting in Montreal on January 19th next. Several will be present from the Toronto district, including Mr. A Huntley, of the Hodge-Sherriff Paper Co., Ltd. Toronto.

The Brockville Recorder has been continuously published for the period of a century and to commemorate the event the newspaper has erected a very handsome bronze tablet in its offices. The tablet contains the names of six editors as follows: Chauncey Beach, 1821: William Buell, 1823; T. W. H. Leavitt, 1875; Thos. Southworth, 1881; Hon. George Graham, 1895. The latter is still editor.

Messrs. Warwick Bros. & Rutter, wholesale and manufacturing stationers, King Street W. Toronto, have placed another traveller in the western Canadian territory in the person of Mr. Reg. Booth. Mr. Booth has been many years with the company and also spent three years in the Winnipeg office. He will take care of the middle west with headquarters at Winnipeg where Mr. E. Hazen is in charge. The placing of another western traveller was made necessary by the increasing demand for the firm's lines in the middle west.

An excellent "house organ" is the Christmas number of the Spanish River News, the Employees' paper, published at Sault Ste. Marie, Ont., by the Spanish **River** Pulp and Paper Mills, Limited, constituting as it does a splendid example in which the good-will appropriate to the season may be spread throughout an organization. The cover shows a writing pad on which lies a letter conveying Christmas wishes from the president. Mr. G. H. Mead, to all the company's employees. Letters from other officers are featured on various pages, while others carry photographs depicting various events of the year in connection with the company's operations. The paper is well-gotten up and is done in colors.

Mr. Justice Ore, at Toronto, has allowed the appeal of the Attorney-General from the order of the Master in Chambers, who refused to strike out certain paragraphs of the statement of defence in the action against W. H. Russell and the Russell Timber Co., Ltd., of Port Arthur. The Attorney-General sued for the cancellation of timber licenses, which it is alleged, were improperly obtained by the defendants and for damages for the wrongful cutting of pulpwood. The defendants, in counter-claim, alleged that the Attorney-General was using the action to harass them in their business, and that the action was brought for ulterior purposes. They asked leave to claim $100,000 damages. The paragraphs as to the alleged wrongful use of the action are ordered to be struck out and the defendants are directed to pay the costs of the motions.

UNITED STATES NOTES

Indications that an early resumption of activities in the industry may be looked for are seen in reports of improving business coming from various parts of the country. Leading paper men in most of the big centres show a disposition to view the situation hopefully and many of them confidently predict that a definite turn in the tide of business is due within the next few weeks. There has been no further suspension of operations, at least not to any marked degree, and a few of the plants which were shut down due to the usual holiday depression have made mid-January announcements of their intention to resume part time operations for the present. No fewer than a dozen plants in the Miami Valley, Ohio, are now running on part time following the holiday layoff and most of these are expected to be running full time in the near future as orders are understood to be growing enough to justify greater productive activities. New York, Philadelphia, New England and Mid-Western paper men generally express optimistic views as regards the outlook for better business in the immediate future. Only in from one quarter is there a tendency to view the situation otherwise and that is in St. Louis where some are inclined to believe that it will be months before any noticeable increase in business will prevail. They say that the outlook for the weeks just ahead is anything but promising because conditions in general are in a bad way.

R. N. Adair has been given charge by the Diem & Wing Paper Company of a new branch recently opened in Indianapolis, Ind. Mr. Adair will look after the firm's business in Indianapolis and adjacent territory. The big Cincinnati paper jobbing house now has branches in Columbus, Louisville, Birmingham, New Orleans and Indianapolis.

In a bulletin recently published by the State College of Forestry, Syracuse, N.Y., Prof. Edward F. McCarthy, of the department of forest utilization and Prof. H. C. Belyea, of the forest engineering department, give the results of an extensive study of forestry conditions in the New York State. The study, carried on for many months in the Adirondack Forest by the compilers of the work and a party of assistants, had for its main purpose experimentation with a rapidly growing tree species. The yellow birch came in for the most attention, and its utilization for the paper industry was studied in detail. The findings contained in the bulletin, which is issued under the title, "Yellow Birch and its Relation to the Adirondack Forest," should be of immense interest to the forest profession because it is probably the most exhaustive study of yellow birch growth and forest conditions ever made.

Work on the big new dam built at Chateauguay Lake as an adjunct to the High Falls Pulp and Paper Company has been completed. This dam, constructed at a cost of about $90,000, replaces an old structure which had outlived its usefulness as a river regulating medium. The High Falls Company is controlled by the New York World, which it supplies with newsprint. The daily output of this plant is about 60,000 pounds.

Logging operations in Main are likely to be greatly curtailed this winter owing to the uncertainty as to the future in the lumber market. Several concerns in the pulpwood business are on the point of quitting altogether. One pulpwood firm that has extensive land holdings in Nova Scotia has decided not to cut a stick this winter and its manager has returned to Bangor. "Everyone is up in the air on the pulpwood market," says this manager, "and no one can guess what is going to happen next. There seems to be a concerted effort on the part of the paper manufacturers to drive down prices on pulp, which, of course, would mean lower prices for wood. Those of us who have been getting out pulpwood for the market have not noticed any marked reduction in the price of paper and until that drop takes place, the pulpwood men will sit tight and await developments.

Officials, superintendents and district sales managers of the American Writing Paper Company, met recently at a three day conference in the company's offices at Holyoke, Mass., for a general discussion of sales conditions. Sales representatives from branches in all parts of the country were on hand. President George A. Galliver; Vice President, R. R. Campbell; Herman Harrington, production engineer; M. L. Cramer, of the puchasing department; Dr. Rindfusz of the technical control department and others addressed the several meetings.

The Bowdoin paper mill of the Pejepscot Paper Company was shut down for a week, beginning January 10, owing to a lack of orders.

The Albany "Argus," established in 1813, oldest newspaper in New York State, published its last daily issue recently prior to being merged with the "Knickerbocker Press," whose owners came into control of the "Argus" through purchase.

FIRST MEETING OF THE CELLULOSE SECTION.

At the Cellulose Symposium held by the Industrial Division of the American Chemical Society at the meeting in Chicago last September, it was voted to form a permanent Cellulose Section. Following the meeting the necessary steps for organization were taken, and President Noyes appointed Professor Harold Hibbert of Yale University, Chairman of the new section with Gustavus J. Esselen, Jr., Secretary. One of the objects of the section is to provide an opportunity for those interested in the practical application of cellulose to get together with those concerned with the more strictly scientific aspects of cellulose chemistry and to afford an opportunity for discussion which should prove mutually helpful.

An interesting program is being arranged for the first meeting of the new section in connection with the meeting of the American Chemical Society in Rochester, New York, beginning April 26th. Those having papers which they would like to present before the section are requested to send title and abstract before April first to the secretary, who may be addressed care Arthur D. Little, Inc., 30 Charles River Road, Cambridge, 39, Massachusetts.

G. J. ESSELEN, Jr.,
Secretary.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, Jan. 13. — Conditions in the Canadian paper trade are still somewhat unsettled and buying is light owing to the general belief that the bottom in price reductions has not yet been touched. It is claimed in some quarters that the trade is suffering in consequence of these unsettled conditions and the conviction is freely expressed that business will not be speeded up to a satisfactory point until paper merchants and manufacturers respond to the falling market. It is known that manufacturers of some lines of paper are hesitating to scrape the bottom of the price level in view of the heavy overhead and the increased cost of some lines of raw stock, but many experts in the trade declare that if prices are to be still further lowered it should be done at once in order to get back to normal conditions and accelerate buying. In other words, rock bottom should be reached at once, based on manufacturing costs and a fair profit, and if the trade will stand any further reduction, there should be no delay in putting it into effect, for in the paper trade, as in other lines of commerce, a falling market is not calculated to stimulate buying but rather the reverse. There is no great complaint by either manufacturers or jobbers as to the volume of business being done, although, of course there has been a big falling off. But making allowance for the prevailing period of depression in trade circles generally the pulp and paper field is keeping up fairly well and what losses of business that are being experienced are being taken philosophically and in the belief that buying on a fairly large scale will shortly be resumed. In some lines of paper a distinct improvement in sales has been noted.

BOOK PAPERS.—Book paper mills are busy readjusting their prices and some of the mills have already issued new lists based on the lowering trend of papers generally. Book papers are already being sold at reduced prices but these prices are said to be of a temporary character and will be until all the mills come into line. The readjustment at present being made applies to book papers, bonds, ledgers and fine papers generally and while jobbers are selling on the basis of the lowered prices, the new schedule will not be ready until next week. Several of the jobbers report a picking up of trade conditions in fine papers and say that some lines are moving considerably more freely than during last month. Good business is looked for when prices become stabilized. While the coming new price list will be the result of a downward revision, it is said that each line of paper will have to stand on its own footing and that while most lines will be reduced there may be some lines that may have to be increased in price. In each case, however, there will be an adherence to the principle of fixing the mill price in accordance with the cost of raw stock and labor. It is generally understood, however, that when the prices of fine papers are finally and uniformly fixed there will be no further reductions until labor and raw materials take a further drop. Just now some of the raw stock is higher than ever, although the various lines of pulp are down.

KRAFT.—The kraft mills report a fair quantity of business, comprised of small orders, but the days of big business appear to have passed, temporarily at least. There has been a slight revival but both mills and jobbers could handle a good deal more business than they are getting. The general situation in the kraft and wrapping paper fields will be canvassed at a meeting of manufacturers to be held in Montreal on Jan. 19. In the meantime kraft is selling at the reduced price of 11½c and kraft pulp at $125 a ton.

COATED PAPER.—Coated paper mills report that while they have had to contend against a few cancellations there are very few coming through now. The depression in the paper trade has not touched them to any great extent. They are still working on back orders and say that they are still unable to get enough paper from the paper mills. The coating mills are still short of m. f. paper and say that they are not receiving enough from the paper mills to meet their requirements.

WRAPPING PAPERS.—Jobbers report that a fair volume of business was done during January and the present month is opening up well with small orders but no big lots of wrapping or bags are being sold. The recent reduction in prices has stimulated buying somewhat but not to any great extent as yet. The trade is looking forward to a revival of business within the next few weeks.

TISSUES AND TOILETS.—There is a fairly good demand for both these lines and the mills report that they are fairly busy filling orders of small dimensions business and have not yet been called upon to make stock for future trade. While there has been a big falling off in business the past week has shown a considerable improvement in sales, which the mills do not attribute to the recent price reductions but to a healthier state of the trade generally.

MANUFACTURING STATIONERY. — Wholesale and manufacturing stationery houses appear to have been but little affected by the present lull in the paper trade industry. One big Toronto firm put on an extra commercial traveller in the western territory this week in response to the demand for blank books and stationery in the middle west. Business is reported to be satisfactory and consumers will shortly get the benefit of reductions on the prices of raw material such as bonds, ledgers, book paper and news. Scribbling books have already been reduced, manufacturers now paying 7c for flat news as against 10c a short time ago. Other lines of manufactured stationary will shortly be reduced, it is understood. The trade generally appears to be in a healthy condition.

BOX BOARD.—Further reductions in the prices of several lines of box board went into effect this week, following the general reductions announced about three weeks ago. Plain chip is reduced from $80 to $60 a ton; plain straw board is reduced from $80 to $60 and vat-lined chip board is down from $90 to $75. These prices are subject to change without notice. The trade reports business dull and sales somewhat meagre.

PULPWOOD.—Enquiry among the dealers in pulpwood reveals a prevalent belief that next years prices for wood, which will not be fixed until May or June,

will show a ten or fifteen per cent reduction as compared with the current year's prices. Practically all of the cut has been sold in Ontario but there is said to be quite a quantity in Quebec that is still unsold.

PULP.—None of the paper mills are experiencing any difficulty in getting pulp supplies now and the market is reported as being somewhat dull. Some of the mills are closed down and others are contemplating repairs which will be undertaken during the present quiet period. Strong sulphite is now obtainable at $140 and news sulphite at $100. Bleached sulphite is quoted at $165 and ground wood is available at $95.

RAG AND PAPER STOCKS.—The week saw a slight decline in some grades of new cotton cuttings, and the outlet to consuming mills has not widened as yet. The price list has therefore gained little in firmness of what values on the various grades are. Some of the paper manufacturers have resumed, or increased operations after the holiday shut-down, but there has been no increase in business except, perhaps, in enquiries. Dealers report that producing sources are still generally shut down, and are putting out a very small proportion of the usual production. Old cotton rags have shown a decrease in price, although there seems to be a considerable firmer tone to the market. This has been due, not to demands from the mills, but rather it has been accounted for by the fact that there are comparatively few rags on the market, and holders are not offering anything at sacrifice prices. Some of the high grades of paper stock have fallen off quite sharply in price, and there has been very little business in waste paper. White blanks and No. 1 manila cuttings and kraft have declined perceptibly since the last quotation, while mixed and newspapers are moving in small volume at the same prices. Nearly all the mills are buying from hand to mouth and any orders placed are for small quantities only. Books continue firm and the mills are absorbing a fair tonnage regularly.

	Per Cwt. F.O.B. Toronto
No. 1 shirt cuttings	$18.00—$19.00
No. 1 unbleached cotton cuttings	11.50— 12.00
No. 1 fancy shirt cuttings	9.00— 9.50
No. 1 blue overall cuttings	8.00— 9.00
Bleached shoe clip	11.00— 12.00
White cotton hosiery cuttings	14.00— 15.00
Light colored hosiery cuttings	11.00— 12.50
New light flanellette cuttings	11.50— 12.00
No. 2 white shirt cuttings	8.50— 9.00
City thirds and blues (repacked)	1.90— 2.00
Flocks and satinettes	.80— .90
Tailor rags	.60— .70
Gunny bagging	1.10— 1.20
Manila rope	3.75— 4.00
No. 1 white envelope cuttings	6.75— 7.00
No. 1 soft white shawings	6.00— 6.50
White blanks	2.75— 3.00
Heavy ledger stock	3.50— 3.75
No. 1 magazine	1.90— 2.00
No. 1 book stock	1.75— 1.80
No. 1 manila cuttings	2.75— 3.00
No. 1 print manila	.75— 1.00
Folded news	.75— .80
Over issue, news	1.30— 1.40
Kraft	2.75— 3.00
No. 1 clean and mixed papers	.30— .40

NEW YORK MARKETS.

New York, January 15—(Special Correspondence)—The paper market has developed no new feature of importance. Demand is still of limited scope, consumers with very few exceptions confining their buying to supplies directly required, with the most encouraging element being that of increased inquiry. Large users of paper are placing contracts covering future needs without seeming reluctance and are meeting the prices asked by manufacturers, and buyers in general are exhibiting more interest although spot demand is very nearly of the same nature and compass as it was when the new year was ushered in.

Prices have undergone little fluctuation. Manufacturers are holding firmly to quotations and appear satisfied not to get orders unless their basis of price is met. Jobbers in turn are not lowering prices any further, claiming that they are unable to acquire fresh supplies from mills at any recession in cost. The price tone therefore is steady, and, and it would certainly appear that paper prices have about touched bottom for a time.

Mills which closed down during the holiday season are gradually resuming operations. Reports from book paper mill centres say that this class of paper manufacturers are obtaining enough business to keep them running at close to full production, and there has been no let up in activities among newsprint mills. The demand for newsprint is of sufficient volume to absorb practically all the output of mills, and it is understood that a good many mills have disposed of virtually their entire 1921 production to contract customers. Prices on newsprint hold at between 7 and 7.50 cents a pound to transient buyers and around 6.50 cents on contract. Occasional shipments of fairly large tonnage are being received from European sources, as for example, a shipment of 6,416 rolls arrived at New York this week from Finland, but such supplies have no apparent influence on the domestic market. In fact, if anything, receipts of imported newsprint have dwindled during recent weeks.

Book papers rule quotably steady at around 12 cents a pound for machine finished book. 13 to 14 cents for supercalendered, and 15 cents on coated book. There are few offerings of sizable quantities of book papers being made. One reason for this is that the average book paper mill has the great bulk of its output sold for sometime ahead and is not particularly desirous of disposing of the surplus it still has to sell, presumably figuring that better prices can be obtained later on in the open market.

Tissue papers are comparatively quiet. With the pre-holiday trade a thing of the past, consumers are generally holding off in buying, and manufacturers as a usual thing are looking for orders. Prices nevertheless hold steady at $1.80 upward to $2 on No. 1 white tissue, and in the neighborhood of $1.75 on No. 2 white and No. 1 manila tissue. Wrapping papers also are in a quiet market condition, there being but a routine demand. Fine papers are moving relatively good volume and at steady quotations. It is quite apparent that demand for writing papers is running chiefly toward the lower qualities but in the aggregate there is moderate activity in the market.



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INQUIRIES SOLICITED

Boards are sought by consumers in limited amounts and yet the market appears to be strengthening, even if only sentimentally. No further reductions have been reported made in prices, and manufacturers almost as a unit are becoming increasingly insistent on the figures quoted, which range around $50 per ton at mills for filled news board and $45 for plain chip board. A feature of the board market is that fairly large quantities of strawboard are arriving in this country from Germany.

GROUND WOOD.—The tone of the mechanical wood pulp market is steady and a moderate trade is reported current. Consumers continue to operate cautiously as buyers, generally absorbing only such supplies as are actually and immediately required, and yet mill agents and dealers tell of marketing quite a lot of pulp. Every indication would seem to point to the situation growing more active although the change is slow. Prices hold at between $95 and $100 a ton at grinding plants for domestic pulp of prime quality for prompt delivery and from $85 to $90 for imported ground wood.

CHEMICAL PULP.—A fairly good routine business is passing in chemical wood pulp, and while the market still lacks the life and snap of busier periods, there is sufficient doing to well maintain values, with the tendency of quotations distinctly upward. Everyone on the selling end of the pulp trade seems bullishly inclined. It is felt that when paper mills begin to experience more activity in their own product and resume buying pulp on a more normal scale that there is every probability a near-scarcity of pulp will develop, thus making for higher prices. Those producers and dealers having unsold stocks of pulp on hand consequently are not exerting undue efforts to unload these supplies, but are content to hold them for a while. There is therefore very little selling pressure and buyers in want of pulp invariably find it necessary to pay the prices asked.

No change in quotations of note has occurred. Domestic bleached sulphite is priced at 7.50 to 8 cents per pound at pulp mills, domestic easy bleaching sulphite at around 7 cents, news grade sulphite at 5.75 cents and domestic kraft of No. 1 quality at 5 to 5.25 cents.

Receipts of foreign pulp at the port of New York this week included 11,700 bales from Hernosand and 12,956 bales from West Hartlepool.

RAGS.—Demand for papermaking rags has been a little livelier during the present week. Consuming mills have continued to refrain from placing orders for large tonnage, but small-lot sales have been of greater number and there has been increased inquiry. The tone of the market is steadily firming. As an example, dealers who a few days ago were freely accepting orders for No. 2 roofing rags at 85 to 90 cents per hundred pounds at shipping points have this week turned down further orders at the same basis, it being their contention that they cannot secure rags at same prices from packers. No actual advance has been scored in prices, mainly for the reason that mills have refused to pay more, and yet it is becoming more difficult for buyers to secure supplies at the basis at which they recently have purchased.

Old white rags are especially firm. Dealers ask 7 cents and more for No. 1 miscellaneous packing of whites and around 9 cents for No. 1 repacked, while house soiled whites are held for 3 cents and higher and street soiled whites at 2.50 cents. Thirds and blues, on the other hand, can be bought at relatively cheaper figures, repacked thirds being offered by dealers at 3 to 3.25 cents and miscellaneous packing at 2.25 to 2.50 cents. New cuttings are quotably steady.

PAPER STOCK.—The paper stock market has exhibited signs of increased activity. Board mills located near to New York have been more actively in view as buyers of the low grades, and sizable amounts of folded newspapers have been moved at 60 to 70 cents per hundred pounds and of No. 1 mixed papers at 40 to 45 cents a hundred. White blank news cuttings meet with a ready sale at around 2.75 cents a pound at shipping points, and a better demand is reported for magazines, which command in the neighborhood of 1.50 to 1.60 cents from mills for No. 1 heavy books and magazines. There is still a lack of interest evinced in shavings and quotations are nominally around 5.50 cents per pound for No. 1 hard white and 4.50 cents for No. 1 soft white shavings.

OLD ROPE AND BAGGING.—Paper manufacturers are mostly neglecting offerings of old rope are nominally around 5.50 cents per pound for No. tely established price basis. Around 4.50 cents a pound is asked by sellers for No. 1 manila rope and 1.75 to 2 cents for No. 1 scrap bagging, with the probabilities in favor of buyers obtaining some supplies at lower levels. Gunny is easy and offered at 2 cents and less.

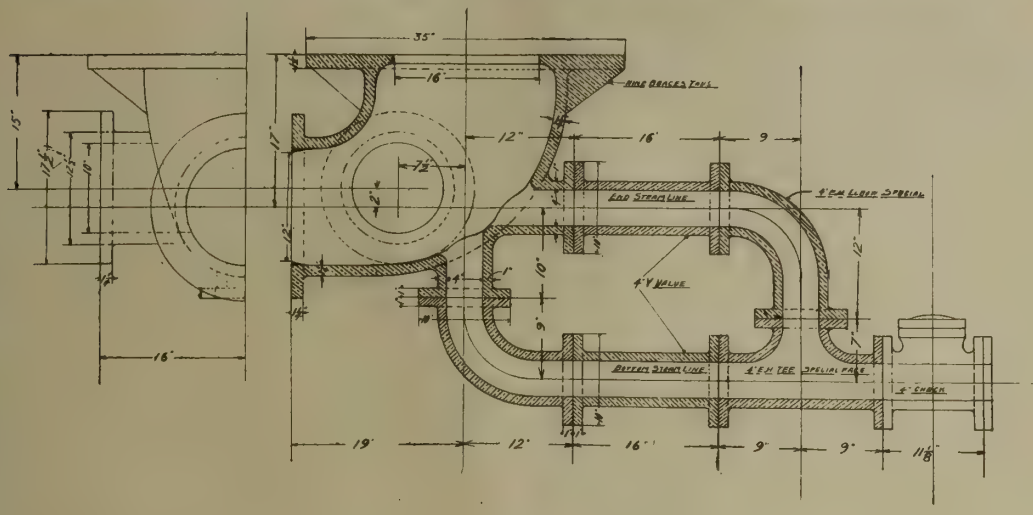
An awful lot of energy is used in hating people who don't care whether you do or not. — Making Paper.

Scandinavian American Trading Co.

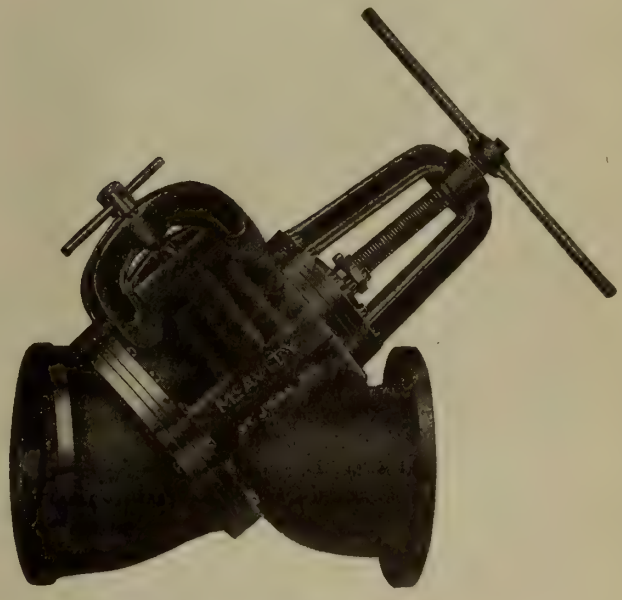
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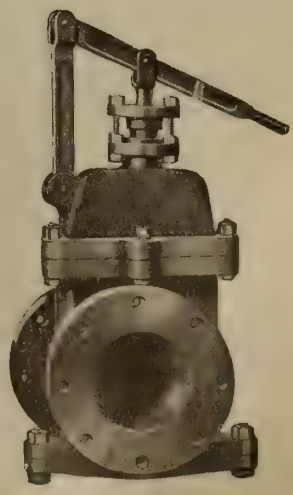
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SLASHER SAWS.

What is the best guard for slasher saws? The best that I can offer would be to take them out of the mill altogether, but that, at the present time, is almost an impossibility. Therefore, we must give our attention to the best method of safeguarding this dangerous operation. In my inspection of saw mills in several States, I have found that a large percentage of the slasher saws are not protected. These saws should have a guard placed in front of them. Not only is there danger of a man falling on these saws, but if one of these saws should break, which every sawmill man knows happens quite frequently, and any part of it strike a workman, the result would be hard to describe. A guard can be easily applied, and can be made of wood, pipe or strap iron. The cost of this guard is very small, and even though it cost hundreds of dollars, could you compare that with a HUMAN LIFE? Many sawmill foremen, and even managers, have made the statement that they did not think there was any great amount of danger with these saws exposed, and furthermore, if a man did get hurt back there, it usually was a man that did not belong there. It does not make any difference if he belonged there or not — a human life is a human life, and it is the duty of every man who has the authority to do his utmost in safeguarding his men. However, these foremen and managers did admit that there was a POSSIBILITY of a man receiving a serious injury. So if there is a possibility, then it should be guarded, for that is what we are working on—POSSIBILITIES AND FACTS. We cannot say that a man is sure to get hurt on a certain dangerous point, but we can say that there is a possibility, or that a man once received an injury there and there is a POSSIBILITY of some other workman receiving an injury from the same cause.

Some time ago I was making an inspection of a sawmill, and in this particular mill the slasher saws were not protected, except the saws on each outer end. The foreman and I were discussing the protection of these saws, and he claimed he thought that the outer saws being guarded gave all the protection that was necessary, owing to the fact that there were two men working near each end of the saws and no one else had any business getting near the saws in the middle. However, we had not quite completed our discussion of the question when a negro laborer, who was at work on the stripping table behind the resaws, jumped down from his place of duty (he was going to get a drink of water), and as he jumped down in front of these slasher saws he slipped, and both of us fully expected to see him meet his death in a most horrible manner, but by a miracle he stopped within an inch of space. Is this not enough to make any broad-minded man see what a dangerous operation these saws are and that he has failed to do his duty if he has not given this operation the proper protection? Now, if this man had met his death, where could we have placed the blame? Could you truthfully state that this workman was careless? Could you say, with a clear conscience, that you gave that man protection? It is true that jumping down from that platform was an act of carelessness on the workman's part, but again I ask, could you not provide a way that a man could have gotten down without jumping? Perhaps you could have installed a pair of steps which would have reduced that hazardous condition.

So I sincerely hope that every mill that has slasher saws will give this dangerous operation their immediate consideration. Do something to eliminate that POSSIBILITY of a man falling on the saws, or a man receiving an injury from the flying bits of a broken saw. It is your duty—you owe it to your men, and to the community in which you operate.

With a little effort, a few nails, bolts and some lumber, you CAN ELIMINATE THE POSSIBILITY of injury from these saws.—C.A.M., In Common Sense.

WASTE MATTER.

There is a story that a very large and beautiful piece of marble was ruined by a second-rate sculptor in trying to carve a statue, and lay for years abandoned in Florence. The way it had been cut into made it seem utterly useless. But Michael Angelo looked at it, and saw in it the superb David which ranks as one of his masterpieces. His vision and chisel released the beauty which the duller man had not even dreamed of.

We are only now beginning to understand the value of what we have been calling waste matter. The stockyards have known it for many years; and coal by-products have long been the basis of many large and profitable industries, but most of us have been content to take the cream and let the skimmed milk go. There were the "inexhaustible" forests. A friend of ours, as a young man, "cleared" some woodland by deadening all the trees on a fifty acre tract, and burning much of it. Some 200 sycamore trees, each several feet in diameter, went into one bonfire. That was forty years ago, but such trees took much more than forty years to grow. If in the forestry situation "the fathers have eaten sour grapes and the children's teeth are set on edge," there is now, at last, an effort to avoid such destruction in the future.

The remedial measures are two; the slow one of scientific reforestation, as practiced in some parts of Europe; and the quicker method of making fuller use of material. It used to be that pulpwood yielded only cellulose, and the other 65% of the pulp-wood's value "went down the river." To-day, with the high cost of raw material, certain paper mills have developed methods which save nearly all of it, and the paper mill of the future will be also a factory making chemicals for various other industries.

Increased wealth and comfort to an increasing population are conditional upon an ever increasing utilization of waste material. Manhattan barely supported a few hundred natives without even the most elementary comforts. What they wasted was enough to support a great city, and to-day some five million odd people get their living from that same island.

Paper was in its very origin a waste trade, and printing grew out of an attempt to cut out wasteful duplication of effort. In both trades there is room for further advance along the same line. While much of this work must be done by the large manufactories with their research chemists and designing engineers, every one of us can help a little.

One of the easiest ways is to save, bale and sell old rags, and old papers. An inexpensive little baling press is all the equipment needed, and while the cockles of our heart are warmed by a virtuous feeling that we are helping to conserve, your pocket book has that satisfied feeling that comes from getting extra money. —IT PAYS.—"The Caravel."

Excess is an arch enemy of success.—Forbes Magazine.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., January 27th 1921. No. 4

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal,
'Phone Uptown 7773.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

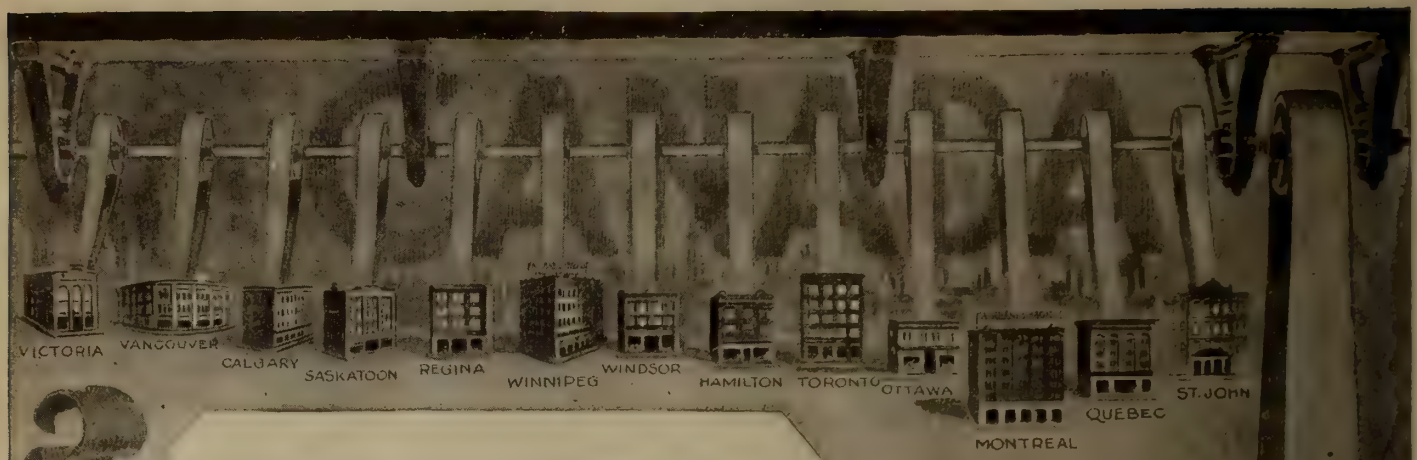
Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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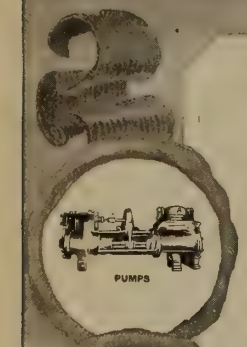
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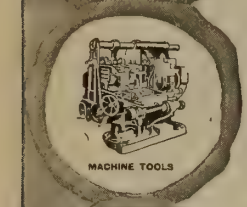
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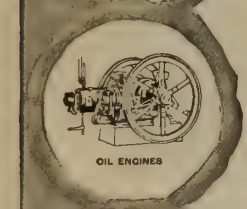
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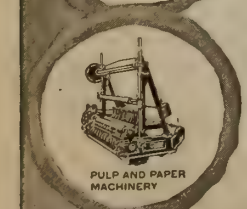


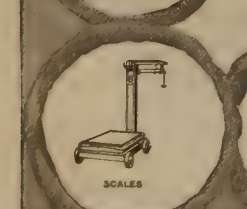
























-:- EDITORIAL -:-

GETTING BIGGER AND BETTER.

The important place which the Pulp and Paper Industry holds in Canada's industrial life becomes more evident each year as the annual convention brings together the leaders of the industry. It is gratifying of course, to have men like Sir Henry Drayton, Minister of Finance for the Dominion of Canada and the Hon. Walter Mitchell, Treasurer of the Province of Quebec, emphasize the position held by our industry, but the consciousness of magnitude and of the greatness of opportunity is felt, rather than heard by one who attends the annual conventions of the Canadian Pulp and Paper Association.

Merely to recite the number of mills, the tonnage of the value of the output, the number of square miles of timber lands controlled, the number of employees or the size of the pay roll does not adequately describe the place which this industry must fill in the industrial life of the Dominion. It is rather the opportunity for doing than the record of accomplishment which should claim our attention. There is a greater obligation and a more important function than simply to make paper, pulp and profits. Profit of course, is the incentive for organization and production supplies the means for making it, but Sir Henry Drayton did well to mention in such emphatic manner at the banquet of the association, the obligation of the papermaker, along with other employers of labor, to relieve each employee of the fear of worklessness. He was quite right in referring to this as being the greatest fear in the mind of every worker.

There is of course, a mutual obligation in this respect and an excellent instance was given by a gentleman from a small town in New York State where a small paper mill is operated. Nearby is a large city and during the war the paper mill employees could have easily gone to the city at several times the wage they were receiving. Nearly every man and girl stuck by their jobs and now that times are a bit slack this employer is standing just as firmly by his employees and they are now in no fear of being out of work. To maintain an organization even at the expense of a portion of the profits is not altogether philanthropy; it is simple justice where the employee has recognised his own responsibility in working steadily and faithfully. On the part of the employer it means maintaining an organization many whom are skilled workmen and of whom all are familiar with his particular proposition.

As Sir Henry remarked in his speech, the paper industry in Canada is sure to extend and in doing so there comes a still greater opportunity for the employment of Canadian labor and there remains the obligation to supply the home market and to support the Government.

As was intimated several times during the convention, the pulp and paper industry is continually becoming a greater force in the Dominion. Under the guidance of the newly elected officers, there is no fear but that as far as the Canadian Pulp and Paper Association is concerned, the industry will continue to exert this power to bring the greatest good to the greatest number.

COOPERATION IN RESEARCH.

One of the most important subjects of discussion at the annual meeting last week of the Canadian Pulp and Paper Association was the matter of organizing for research, a special department of the association's work and the appropriation of a suitable fund for the proper carrying out of such a program. The matter has been thoroughly studied since last July by a special committee of representatives from the Technical Section and the main Association so as to bring to bear on the problem the thought and experience both of the technical man and the director of business enterprises. It has been realised, and this point emphasized in a report of the committee, that a research department is just now mostly a matter of organization. It really requires organized cooperation. . The association readily and speedily voted the necessary funds and in doing so the responsible heads of our companies who gave their unanimous approval to the report of the committee thereby place themselves under obligation and should consider that they have pledged themselves not only to pay their share of the expense, but to render other assistance and encouragement to the new department and the director who shall be selected. In fact, there seems to be no question but that the success of this new line of action depends as much, if not more, upon active cooperation than upon sending cheques to the secretary.

The various committees of the Technical Section have in the work they have accomplished, frequently, perhaps usually, been able to perform their duties because of some degree of cooperation from other members. Oftentimes efficient cooperation has been practically impossible because of the difficulties of doing so by mail and without personal conferences and con-

tinual contact. An instance of this is the work recently done on two of the more important types of alloys used in the mills. The committee on Mechanical Standards found it practically impossible to get useful information either to confirm their findings or to guide them in their investigations because about 90 per cent of the mills either did not have accurate information or were unwilling to share what they did have. The committee felt it was largely the former condition but there may have been a little of both. With a Director of Research, the duties of Technical Section committees should be much less arduous and much more effective. In such a case as has been mentioned, a director, knowing the information desired by a committee, would be able to pick up points here and there and to encourage work in various mills where assistance could be conveniently given so as to approach all sides of a problem with little or no duplication of effort and thus provide each one in the industry with a complete piece of work to which each had contributed a share in proportion to his position and ability.

All members of course, would not be able to assist on every problem nor would such be desirable but in the course of a few years each mill and member would be able to contribute something to the whole work of making our industry more stable, more progressive and more effective.

Someone at the convention asked the editor if the new research department would not soon replace or render unnecessary, the Technical Section. Nothing seems more improbable. As we see it, the Director of Research who will be in charge of this department, will be able to coordinate in an effective manner, the odds and ends of investigations that are undertaken here and there and he will be able by distributing various phases of a large problem among several members, thereby obtain a much speedier solution than would be possible by the single efforts of one individual or laboratory. An example is before the Committee of Mechanical Standards at the present time in the problem of investigating the resistants to the flow of pulp in pipes. The committee first realised the difficulty of a suitable instrument for measuring pressures and velocities. The members of the committee have been working on this phase which, it seems to us, could have been more effectively attacked had there been a central staff and particularly if there had been in existence the National Research Institute which will probably be established during the current year. Having gotten such an instrument there will then come the necessity for investigating typical mill conditions. It is hardly possible that any one mill could supply opportunities for making tests with many different lengths, sizes, kinds and conditions of pipe or with all varieties and concentrations of stock, but a Research Director could make use of such conditions as do exist and thereby distribute expense and eliminate duplication and create an interest in research work.

On casually reviewing the field and its opportunities, it seems to us that a Research Director will save his salary to the association by cutting out duplication of effort and expense by relieving mill managers of much of the detail that they have had to attend to, to say nothing of increased benefit to the industry from the greater effectiveness of properly coordinated effort.

COBWEBS.

One of the pleasantest experience the editor has enjoyed for a long time, was when Mr. George Carruthers, chairman of the Joint Committee on Vocational Education, presented him with the first copy of volume one of the Textbook on the Manufacture of Pulp and Paper. The preparation of these books has been one of the principal concerns of the editor for the past two years. The secretary brought this volume from New York where it was obtained from the bindery but a few hours before train time. The publishers certainly exerted themselves to deliver a sample copy in time for the meeting. It is expected that copies of volume one which contains the necessary preliminary subjects of Mathematics, Reading of Drawings, and Elementary Physics, will soon be available to the public. An announcement will be made to this effect in the journals of the industry.

For some unaccountable reason, several of the Montreal papers referred to the convention of the Pulp and Paper Association as a meeting of foresters. This is partly right but the term is hardly comprehensive enough to cover the whole industry.

The head table at the luncheon of the Canadian Pulp and Paper Association had quite a military appearance. There were General Sir Arthur Currie, General J. B. White, Col. W. E. Haskell, Col. George Chahoon, Col. Sir William Price, Major Percy B. Wilson, and George McKee, whom we shall call a captain of industry.

The Pulp and Paper Magazine, congratulates Mr. Percy B. Wilson and Mr. Geo. M. McKee on their election to the positions of President and Vice-President of the Canadian Pulp and Paper Association and compliments the Association on its choice. The services of the Magazine are always available to them.

In welcoming the new officers we would not overlook our debt to those who have so ably piloted the industry through the past year, Mr. Geo. Chahoon and Mr. Howard Wilson.

If you see a workman doing something carelessly, make it your business to tell him about it. Let him get sore. You have done him a favor, and when he gets over his sore spell he'll thank you. Try it some time.

The University and Industry

By General Sir Arthur Currie, K.C.M.G., Principal of McGill University.

In introducing the speaker of the day, Mr. Percy B. Wilson, the newly elected president of Canadian Pulp and Paper Association, said:—

This is the first occasion I have had to address you, and I am very glad to be in such excellent company. Looking around me, I think you will agree with me that I am in that position.

We have with us today a gentleman whose words we often awaited in the past with unrest. We awaited them with anxiety and when they came we received them with pride, because they told of the doings of the Canadian Corps.

Now, I believe, that while Sir Arthur Currie, our principal guest today, has relinquished his duties as the Canadian Corps' commander, we will receive what he has to say to us today with just as great a welcome as we did what he said to us in the past.

He is now engaged with the great McGill University and as Principal of that Institution, he is bringing forward men who are going to work in our industry in the future. The few talks I have had with Sir Arthur have led me to the conclusion that he looks at this research question just as we all do here, and he wants to give a special and practical light on that question in the University.

Gentlemen, I have the greatest pleasure in the world in introducing to you Sir Arthur Currie. (Prolonged applause).

The Address of Gen. Sir Arthur Currie, K.C.M.G.

I thank you very much indeed for your kind and cordial and flattering welcome, and I hope that in the few remarks I intend to address to you there may be found something that will repay you for the honour you have done me in permitting me to address such an influential gathering.

I thank you, Mr. Chairman, for your kind words of introduction, and may I take this opportunity of extending to you personally my congratulations for the high position to which your associates have elected you.

I know this is not the first occasion this Association has met in the city of Montreal, and I hope it will not be the last. My old friend, Tom Gibson, tells me that Montreal is not such a bad sort of a place for a convention of this kind to hold their meetings.

I also hope, gentlemen, that you will take such action as will lead to this result: and that is, that the dividends that we poor shareholders receive in the future will not be any less, and if there is a tendency on the part of any stock to droop unnecessarily in the market that you will warn us, so we will not lose too much of our money, because we have not very much to lose.

I wanted to speak to you today on the subject of "The University and Industry."

These two words suggest to us two words; very different and very distinct. On the one side, you have the world of inspiration, ideals, thoughts, visions, motives, and on the other side you have the world of method, machines, facts, deeds, action. They are usually as widely separated in our minds as the earth and the sky; but in reality they are the two halves of existence, as no life can be complete or perfect which does not combine them into a beautiful and profitable harmony. Here you have the University, that home of purpose and standards, the nursery of ideas, dreams, inspirations; and here you have industry, the arena of practical things, the place of action, work, diligence, facts. The highest welfare of society demands that we bring the two together. They were intended for each other.



PERCY B. WILSON, President, Canadian Pulp and Paper Association.

Neither can achieve its full purpose without the other. The University alone is only half-life; Industry alone is imperfect and incomplete.

The problem of our time is how to bring them into closer and more effective relations in order that the best interests of humanity may be served. It will perhaps assist us to see the question more clearly, if we narrow our view down to the individual.

After all, the nation, society, or the community, is only an aggregate of individuals, and if we can bring the worlds of motives and of methods to cooperate in a single life, we shall have solved the social problems. There are, perhaps, three kinds of men in

*Address delivered at the luncheon of the Canadian Pulp and Paper Association, held at the Ritz Carlton Hotel, Montreal, P.Q., January Twenty-First, Nineteen Hundred and Twenty-One.

this work-a-day world. The first is the man of theory and visions; the man of thought and aspirations. He has a mind well developed and trained; stored with all the finest ideals and thoughts. He has a ready remedy for all the ills of life, but his standards and lofty conceptions are never transferred into action. He never does a really useful thing. He is all theory, but when it comes to practical work he is useless.

Do we now know him? Is not every town or city burdened with these dreamers and theorists? Very frequently they are college men, bearing after their names a multitude of letters. The throbbing world of work is full of scorn for him. He is filled with "wise saws and modern instances," but he is utterly hopeless when assigned to a day's task.

Then there is the second man; the person who is all activity. He "does" things, while the other man is thinking about them. He dreads vagueness. He hates sentimentality. The important matter to him is that the thing should be done. What matters motive, tall talk, gush, enthusiasm?

If a railway is to be built—why, build it. He does not care whether he corrupts a whole Province in doing so. If an asylum is to be founded—why found it. You may or may not have the men to fill it, but the great need is to get it opened. He makes industry intense. Work is to be done, machines are set running, resources are developed, and the world just hums with action as he flies from task to task.

Do we not also know this man? And have we not learned that there is something lacking in his practicability, noble and effective as it is? Have we not seen that quantity has often been achieved at the sacrifice of quality? That results have been obtained without sufficient regard to their character? That work has been done of a temporary nature, not having the permanence that we all desire to see?

So we come to consider the third kind of man. He is the man who combines theory and fact who fills his work with noble inspirations, whose methods are irradiated with high motives, whose lofty thought is translated into splendid action. He is the educated man who finds expression for his ideas in the throbbing world of industry. Surely this is the kind of a man that the world needs today. He never has a high thought without instantly seeking to send it forth into its fitting action. He never undertakes a duty without struggling to set behind it its profoundest motive. He brings to bear upon the problems of society and industry a knowledge of history; upon the rich resources of nature; the truths of science; upon the tasks of life, the inspiration and ideals of experience. In him are combined the two worlds—the discordant parts are blended into a glorious harmony. He draws together the University and Industry.

When one pauses to think about it, these two great factors of life ought to be constantly related. For what does the word "University" signify? It has an inclusive sound. Originally it was intended to cover all the colleges of whatever branch of learning. May we not interpret it now as comprehending every system or institution where education plays a part?

The University can never be partial. That would be a contradiction of its very name. It must be wide enough to encompass the whole world of ideas or action. In brief, it must be universal, all-inclusive in its scope and purpose. It must manifest an interest in men of every class and condition, and seek to develop them into their very best. It must enlarge its borders until the son of the laborer has an equal opportunity with the son of wealth and affluence. Whatever gifts it has must be held in trust for all men, and there can be no satisfaction until it has extended its influence and helpfulness to every grade of society.

The word "Industry" has a like catholic significance. Too often we have confined it to a certain type of work. The industrious men are discovered in all the departments of human activities. Industry reaches every phase of society—it affects very seriously all the relations of life up into water-tight compartments. Every department bears in greater or lesser degree upon every other, and our task must be to create and maintain harmony among the too-often discordant elements in our humanity.

We cannot close our eyes to the fact that the prevailing discord springs largely from ignorance. Misunderstanding is born of imperfect knowledge; distrust comes of incomplete information; rivalries and antagonisms are the result of lack of study of one another's duties and responsibilities. Knowledge must be increased; education must become more common, before we can hope to disperse the clouds that darken our horizon.

Industry represents two great factors, or perhaps it would be better to say, includes and uses two main resources of life—the material and the human. It is concerned with nature and with men. Its province is to explore and extract the supplies in the natural world and to use men in their development, refinement and manufacture into commercial commodities.

Now, how can the University assist in this important business? Every one realizes that the study of nature and the application of scientific methods in the use of material, are essential to the best results. Nature will respond to the skilled hand much more readily than to the unskilled. In fact, there is always a churlishness in nature to the demand of the uncouth or unlearned explorer. She likes to be treated with respect and devotion; she grows angry against the crude and extravagant demands; she is generous with the careful and provident student of her secrets; the more knowledge we can bring to bear upon the efforts of those who are dealing with the raw product, the better for industry. Conservation of natural resources — or I should say, natural forces—becomes a growing necessity. We have suffered enormously from ignorance and waste. Our land has been impoverished by the greedy and avaricious. There is perhaps no department of life where we need to turn on the light of science more fully than in this realm of material things.

The human factor also claims the attention of the seats of learning. More and more are we realizing that education is essential to efficiency in the workman. Much has been done in the way of trade schools, technology courses, lectures in natural and applied sciences, manual training institutions, but we must enlarge the opportunities for a man in the industrial world to fit himself for the best work.

Education is the effort for a man in the industrial world to fit himself for the best work. Education is the effort to enable men to be themselves, that is, to develop their highest capacities. It must be insisted that the craftsman will be all the better for broadening and developing his mind. The University is interested in greater efficiency, but that is not her exclusive function in the world of industry.

After all, life is more than a trade. It is a vocation. The man who considers his calling both an art and a vocation will have the highest conception of life. He is not so much making a living as he is making a life. He is not pursuing his business for the more material results. No true man merely works for money. The business of life is not profit, but service for the common wealth. There is here no desire to deprecate wealth. It is a great force in our world; a trust that is sacred, but, after all, no man ever did his best work for money. It is only a hireling who has his eye on pay-day, skimping his labor and seeking only cash. The truest workman glorifies his vocation, by putting the passion of service into it.

Goethe passed a scathing comment on his tutor, when he said he was one who "remembered that he had a salary to receive, and forgot that he had a duty to perform."

The heresy which condemns our economic life is this, that business is primarily a means of making wealth for individuals. It involves us in industrial bitterness. The truth which alone can bring decency and happiness is this: that business primarily is an essential social service to the whole community.

Our institutions of education must preach this in season, out of season—at all times. They must further declare that man has a right to the pursuit of knowledge for its own sake, and not merely as a means of greater efficiency.

To provide information and instruction only so far as they will bear upon a man's immediate trade is to prostitute education. That noble word "education" implies the expression and development of the whole man, every faculty and endowment which he possesses. The workman must have opportunities to pursue his tastes and desires outside of his craft.

The divorce between art and labor has resulted in dwarfed and stunted souls. Why should not the laborer be free to gratify his desires for music, poetry or any other life's—what we may call—aesthetic satisfactions? To tie him down rigidly to such avenues of knowledge as lead directly to his vocation, must make him narrow and hard. All men's lives need mellowing. The grind of life tends to harden us all. If the professional man has opportunities for the gratification of particular tastes which lie outside his calling, is there any good reason for denying the same privilege to the workman? Who can measure the value of free libraries, university extension courses, and other facilities provided for the mechanic and artisan? It is the business of the University to put these things within the reach of the humblest man. He will return to his labors refreshed in body and soul, with a clearer vision, a new passion for serving his fellows, and a great zeal for his own peculiar tastes.

Education is the very foundation of a sane, and safe democracy. It will lift the whole community to a higher level and bring a larger measure of prosperity and contentment into society. It will banish the inequalities and injustices which are all too manifest, and it will help to correct the irritation which exists against class privileges.

There is perhaps no branch of Industry which provides a finer illustration of the relations between Education and Industry than that of the Pulp and Paper Manufacturers. It provides a splendid point of contact. It is the medium through which the one shall serve the other. Power and need are the two elements of life, but they must have a medium of introduction. Ideas and knowledge must perish without a point of contact with the great world of need. Your industry presents the very material by which the power of inspiration and ideals can be brought to bear upon the problems of life.

On the other hand, all the paper in the world will be of little use unless it has something to carry to the waiting souls of men. When one catches a vision of the stupendous circulation of books, magazines, papers and letters that bear the increasing knowledge all around the world, he must be impressed with the mutual ministry of education and industry.

It is the province of the University to furnish ideas, to increase the knowledge of humanity. It is the privilege of your Industry to act as messengers for the dissemination and transmission of knowledge. "How beautiful upon the mountains are the feet of those who publish the glad tidings of peace."

Without your aid the student could not be brought into contact with the immense resources of learning. He is hourly dependent upon his books and papers. Without your aid the great world, hungry for news, would sit in darkness and ignorance. Without our aid, the aid of the collegiate institution, your business would, in a large measure, halt and die. It must have a constant flow of information, research and knowledge, in order to fulfill its mission. It waits upon education for its supply of learning that the darkness may be lifted from human minds.

We must, therefore, join hands together in order that the benefits of education may, through the avenue of your magnificent industry, reach the urgent needs of our common life.

In a word, let me briefly sum up what we have been trying to show regarding the relations between the University and Industry.

Life ought to be one grand unit, every part related to every other part. There ought not to be any suspicion of aloofness and remoteness. We are all here to serve. Whatever gifts or endowments any person or institution possesses are held in trust for the whole corporate body. There must be a mutuality of ministry. Industry has a glorious contribution to make for the good of the nation and race. Education also has a high function to perform. By harnessing them together, the various forces in the world, each contributing to serving the other, the world will be lifted forward on its journey, and humanity will march triumphantly on to its highest and truest destiny.

An Appreciation.

Colonel Haskell (International Paper Company) expressed the appreciation and thanks of the association by saying:—With the rest of you, I have listened with rapt attention and absorbing interest to the inspiring and thought-compelling address of your distinguished guest. I know his theme is ideal and practical, and his presentation of the ideals of the world of motive and the world of methods being co-ordinated, will live with us and remain in our minds for many a day.

Now, I want to say that I feel it not only a privilege but an honor to propose a rising vote of thanks to your distinguished guest, who in civic life, as the head of your great University, is only keeping bright the laurels imperishable, which he won on Flanders' Fields.

(A standing vote of thanks was extended to General Sir Arthur Currie, after which the meeting adjourned.)

SAVING EXCHANGE ON FREIGHT CHARGES.

At a conference held in Ottawa, January 12th, the Railways submitted their plan whereby shipments may be forwarded from points in United States to destinations in Canada, freight charges "collect" and shipments will be accepted by them for movement in the reverse direction with charges "prepaid".

They state that a careful analysis of their settlements with U. S. Carriers show that the latter earn approximately sixty per cent of all freight charges collected on International traffic moving in both directions. As the U. S. Railways must, under the rulings of the Interstate Commerce Commission, receive payment for their hauls in U. S. currency, the Canadian carriers contend that sixty per cent of all freight charges collected by them in Canada on International traffic, must be paid to their U. S. Connections in U. S. funds. In order to protect the Canadian Carriers therefor it is proposed that whenever freight charges on such traffic, in either direction, are paid in Canada, a surchange equal to sixty percent of the exchange will be collected on the total freight charges.

Tariffs are being issued by the Canadian carriers providing accordingly, and will become effective on January 22nd.

The rate of exchange quoted for New York funds by the Bank of Montreal, at noon, in Montreal, on the last day of each month will govern from the first to the fourteenth of the following month; similarly such quotation at noon on the fourteenth, shall govern from the fifteenth to the last day of such month, inclusive.

Telegraphic advice will be sent to interested Canadian Railway Agents on the fourteenth and last day of each month, indicating the rate of exchange to govern the surcharge for the next ensuing period, and copy of such telegram will be sent to the Board of Railway Commissioners who will hand it to the Canadian Press for distribution to the public.

The surcharge will be collected at the rate governing on the date of shipment from Canada or on the date of arrival at Canadian destination.

In determining the surcharge fractions less than one half shall be disregarded and fractions of one half or over shall be counted as one per cent.

Example:—If the exchange on the 14th should be 18 p. c., the surchange to govern for the remainder of that month shall be 11 p.c.

It has also been arranged that the Railways will furnish the Board of Railway Commissioners with particulars as to how this plan is working out, so that if necessary the proportion of sixty percent estimated for U. S. carriers, may be revised.

It may be felt that shipments moving over routes with most of the haul in Canada are still bearing a heavy burden, but it will I think be appreciated that the proposed arrangement is an improvement over the present one, whereby total freight charges must be paid in U. S. currency.

An exception has been made of shipments of coal and coke, moving from United States, charges on which will still have to be prepaid to the Border in U. S. currency, balance coming forward collect payable at Canadian destinations in Canadian currency.

Yours faithfully,
G. P. RUICKBIE.

J. R. BOOTH, LIMITED, INCORPORATED.

Ottawa, January 23.—The announcement contained in today's Canada Gazette that the firm of John R. Booth has been incorporated as a joint stock company under the title of J. R. Booth Limited, will be of wide interest, for it has been stated more than once, the firm of John R. Booth has for some years now been the largest business in the entire world, operated as the property of one man.

The new firm has a capital of 10,000,000 dollars divided into 100,000 shares of $100 each. The first directors are John Rudolphus Booth, lumber merchant;



JOHN R. BOOTH,
Active head of $10,000,000 concern at 94 years of age.

Charles Jackson Booth, John Frederick Booth, Helen Gertrude Fleck, wife of Andrew W. Fleck, and Wentworth Green, solicitor, all of Ottawa.

For almost seventy years the firm which now merges into the joint stock company, has been conducted personally by John R. Booth. It is understood that very little of the stock of the company is held outside the Booth family.

Considerable speculation has been indulged in as to the reasons of John R. Booth creating a joint stock company out of his vast business. One explanation is that the change will effect a saving of a great many thousands of dollars in connection with the Dominion income tax. John R. Booth, it has been surmised, has been one of the heaviest individual payers of income tax in the entire Dominion.

PAPER FACTORY IN ECUADOR.

According to the "Paper Trade Review" English capitalists have received permission from the government of Ecuador to build a paper factory in Ecuador where are still great forests to be exploited. This concession will include the permission of building a railway through the forest. A wharf and customs house in Guayaquil will be begun at once by the Government.

They say when a person commits suicide he usually has an unbalanced brain. We wonder if that would not apply to some of our chance-takers, who try to commit suicide by taking chances? Is there any difference?

The Association's Annual Meeting

The following pages contain the address of President Geo. Chahoon, Jr., of the Canadian Pulp and Paper Association, and the reports of the various Sections of the Association as presented at the annual meeting, Jan. 21, 1921.

THE PRESIDENT'S ADDRESS.

In looking back over the year just closed, there are a number of outstanding things in connection with the work of the Association that are entitled to your consideration.

First and foremost, I think we should place the initial steps which have been taken towards establishing a Department of Scientific and Technical Research in connection with the industry. The preliminary details have been carefully mapped out and the scheme as a whole, has, I am pleased to say, met with practically universal approval from the members to whom it has been submitted. The Secretary will place the subject before you in detail, together with a statement of the responses received, and it will be for you to say whether this work shall proceed and to what extent.



GEO. CHAHOON, Jr., Retiring President.

The Executive Council have already given it their hearty approval.

In this connection, it is gratifying to be able to report that some progress has been made during the year by the Committee having in charge the preparation of a series of educational text-books, for which funds were voted at the two preceding general meetings. The Committee will make a report of their work at this meeting.

The Council, at the instance of the Technical Section and the Committee on Mechanical Standards, voted $1,000 to be applied to an investigation into copper alloys and bearing metals.

Newsprint Control Abolished.

An important event for the Newsprint Section of the Association was the termination, in July last, of Government control of the price and distribution of newsprint in Canada, which had been in effect for over two and a half years. This action, as you are all aware, was preceded by an appeal to the courts by Price Bros. & Company, Limited, against an arbitrary order issued by the Board of Commerce, the result of which was definitely to establish that the industry had for a long period suffered impositions and restrictions which could not be justified under an impartial application of the constitutiional law of the country. The Association and the industry are under obligations to Price Bros. & Company and to Sir William Price in particular for their courageous action in bringing the question to an issue.

Prior to the final lifting of control, a determined effort was made, in June last, by certain of the newspaper publishers to secure new legislation intended to reinstitute control in some other form. The Government, in fact, introduced a Bill in Parliament for that purpose, but withdrew it after prolonged hearing in which both interests were represented.

It should also be stated that amicable relations have been restored between the publishers and the newsprint manufacturers, and that some of the more representative publishers have made record of their convictions, as a result of the experience of the past three years, that Government control of the newsprint industry of Canada would be in a stronger position today had the laws of trade been permitted to take their natural course without interference.

Forestry Legislation.

The question of the conservation, proper administration and perpetuation of our pulpwood supplies continues to be one of the most vital affecting our industry. The provincial governments of Quebec and Ontario have recently revised the regulations under which their Crown lands are administered, not only with a view to enlarging their revenue therefrom, but also with that of ensuring a continuity of supply of pulpwood. The Association Executive and particularly the Woodlands Section, under the able guidance of Gen. J. B. White, have co-operated in these efforts. The Woodlands Section held a most successful meeting in Toronto during the fall, the first to be held outside the Province of Quebec.

At the Imperial Forestry Conference, held in London last summer, the Association was officially represented by Mr. Ellwood Wilson, while several of its members were also present in other capacities. The Conference developed a very considerable interest in Canadian forestry matters, and it is understood that its next meeting will be held in the Dominion.

The passage by the Congress of the United States of the legislation known as the Underwood Resolution, seeking to open the way to the free exportation from Canada of pulpwood cut from Crown lands, naturally provoked much interest among our members, who feared that this measure, if it were successful, would prove detrimental not only to their industry, but to the

country at large, and therefore regarded its disapproval by the President with satisfaction.

The Executive Council feel that there is great need of educational work among the people of our several provinces in connection with the securing of proper, effective and adequate legislation for the protection of our forests, and the perpetuation of our wood supplies. In proposing such legislation, we have also realized that we have certain obligations of our own to perform, one of which is to assist in building up as far as possible a public sentiment that will support the several provincial governments in enacting this legislation and in giving it due effect. As one means to this end, the Executive Council proposes the coming year to send a representative of the Association to Northern Europe to gather what information we can regarding forestry conditions there and to supply the information so obtained to the newspapers and periodicals of Canada, and thereby to assist in convincing the people of the Dominion that it is to their interest, no less than our own, that progressive forestry legislation should be enacted, and that the proposed regulations should be made effective.

The Tariff Commission.

Through the Executive Council, a Special Committee was appointed to appear before the Cabinet Committee



A. L. DAWE, Secretary Canadian Pulp and Paper Association.

on Tariff on behalf of the pulp and paper industry. Mr. S. J. B. Rolland and Mr. F. J. Campbell appeared before the Commission and presented an argument which we have every reason to believe, met with the Commission's approval.

Foreign Visitors.

The Association was honored during the year by having as its guests several gentlemen associated with the pulp and paper industry in Europe. Among them were Baron Mannerheim and Mr. Storjohann, of Stockholm, Sweden; Mr. Walter Graesbeck, managing director of the Finnish Cellulose Association, and Mr. Hj. Gronvik, managing director of the Finnish Paper Mill Union, of Helsingfors; and Mr. Carl Wahren and Mr. Alfred Byval, of Finland. The conferences which ensued were, on our part, aimed at impressing the representatives of these different countries with the benefits to be derived from the exchange of statistical information bearing on conditions prevailing in the industries of their countries and our own. These gentlemen returned to their homes apparently appreciating greatly the evidences of confidence and co-operation existing between the members of the industry in Canada and the United States, and with the intention of so organizing their own industries as to be in a position shortly to offer us, through the exchange of statistical information, all of the benefits that could be derived from a world-wide association.

Several of our own members also made trips abroad during the year. Mr. J. A. Bothwell and Mr. T. J. Stevenson, as the Association's representatives, and Mr. G. F. Steele visited the Scandinavian pulp and paper industries and received a cordial welcome, and were offered an insight into conditions as they exist in those countries. Mr. H. Biermans and Mr. C. Howard Smith also made trips abroad during the year and brought back information of much benefit to the industry generally.

Our relations with our sister organizations in the United States have continued of the utmost cordiality, and there have been numerous interchanges of personal visits and of normal and informal greetings from both sides of the line.

The Imperial Press Conference.

The Association was honored during the year by an invitation to appear before the meeting of the Imperial Press Conference, held in Ottawa. The publishers therein represented displayed a lively interest in Canada as a source of paper supply for the British Empire. Many of the visitors also took advantage of the opportunity afforded them of paying visits of inspection to a number of the mills.

Our Transportation Department.

The Transportation Department, under the direction of Mr. G. P. Ruickbie, continues to do much good and useful work, both in securing the adjustment of claims and in representing the Association before the Board of Railway Commissioners and other bodies. Not all the members make as full use of this Department as they should, but those who do so are well satisfied as to its benefits. Those who are not fully acquainted with the Department's usefulness and its work should study carefully the report in detail to be submitted at this meeting with a view to determining whether or not its services could not be used by them to their advantage.

The Association's Handbook.

For the first time in its existence, an attempt was made during the year to collate and publish, in easily available form, information and date respecting the history, progress and ramifications of the industry, which resulted in the publication of the "Handbook of the Canadian Pulp and Paper Industry," with which you are all familiar. Several thousand copies of the book have been printed and distributed, and the work has met with very general favor. Demands for the book have come in from practically every quarter of the globe where paper is used, and the results cannot but be beneficial to our members. It is the intention to revise this book from time to time so as to keep it as an up-to-date compendium of information in respect to the pulp and paper industry of the Dominion.

In Conclusion.

In conclusion, the members will be gratified to learn that the affairs of the Association generally are in a healthful state, as the report of the Secretary-Treasurer to be presented will indicate. There have been several additions to the membership, and much activity all along the line, The various Sections, as their reports to be placed before you will show, have all been usefully employed, and are planning progressively for the future. It has been found necessary to amend By-Law No. 10, governing the revenues of the Association, in some particulars in order to keep pace with the increasing activities of the organization, notice of which has been sent to all the members, and confirmatory action is asked of this meeting.

Personally, if I may be permitted a word, I would express my appreciation and gratitude for the loyal co-operation of the membership, as well as for the faithful services of all those engaged in carrying on the Association's work. I bespeak, also, your hearty support of the incoming administration, as I believe that during this year, perhaps more than ever before, close co-operation and mutual assistance will be found essential to the progress of the organization and to the welfare of its individual members.

Reports of Sections of the C. P. & P. A.

THE NEWSPRINT SECTION

By GEO. M. McKEE, Chairman.

The records of the year just closed, relating to the newsprint industry, show that price and demand continued upward from the beginning of the year until the very end.

The cry for supplies of newsprint from almost every country in the world taxed the producing capacity of this continent as far as it could be engaged. This insatiable demand forced prices upward, and created an enormous "spot" demand for newsprint paper. A large number of paper-making machines that usually made other grades of paper, were attracted to producing newspaper, and this, together with the installation of some new machines and the high production records of the regular newsprint mills resulted in the largest tonnage ever produced by the United States and Canadian mills. This approximated 2,400,000 tons, or a gain of nearly 11 p.c. over 1919 production.

According to the figures available, production for the sixteen Canadian companies reporting to this Section, was about 883,000 tons, a gain in production of 113,198 tons, or nearly 15 p.c. A portion of this increased tonnage was due to the starting of new machines in some of the existing plants, but not entirely, as all of the mills operated throughout the year at a higher production efficiency than ever before. This high operating efficiency is brought about by friendly rivalry among the mills, and the free exchange of operating data, all of which tends to place our industry on a very high plane.

In reviewing the past year with its continued increased demand for our product, the opening of the new year presents new problems as regards the future outlook in reference to the phases through which general business is now passing. It is quite possible that the prices of newsprint paper may show some reduction, especially in the so-called "Spot" market, during the coming months. The Canadian manufacturers have had no interest whatever in this market, as practically the entire tonnage has been sold on a contract basis, at reasonable prices. In fact, some of the contract prices were extremely low, taking into account general market conditions. None of the manufacturers were attracted by the frequent "Spot" offers, but adhered strictly to their contract obligations. With this record behind them, the Canadian manufacturers of newsprint have little interest in the much talked about world wide readjustment in commodity prices; their prices have not been high, and therefore have little to fall.

It is gratifying to report that the manufacturers were able to handle the requirements of the Canadian consumers throughout the year, without Governmental interference. The Canadian market having been placed on a competitive basis, all the publishers were fully



GEORGE M. McKEE, Vice-President of the C.P. & P.A., Chairman Newsprint Section.

supplied with paper, and amicable relations now exist between producer and consumer. All of the former antagonistic attitude having disappeared, the publisher now shows every desire to meet the manufacturer on a straight-forward business footing.

With regard to the future outlook, it is impossible to estimate how long readjustment will take. The underlying conditions of the Canadian newsprint industry are sound, and it is only reasonable to expect that, with the prestige of Canadian newsprint in the world's markets, we will readily adjust ourselves to the new conditions, and that the industry will enter upon a new era of expansion and prosperity exceeding any that it has heretofore enjoyed.

REPORT OF JOINT COMMITTEE ON RESEARCH.

The report of this committee is held over so as to include with it the important discussion of the matter by the main Association and by the Technical Section.

(See page 111 for election of officers.)

MECHANICAL PULP SECTION.

By J. A. BOTHWELL, Chairman.

The year 1920 was one of extreme activity for the members of the Mechanical Pulp Section. In the early part of the year the abnormal demand for newsprint paper and the high price level reached in the spot market was reflected in an increased demand and higher prices for groundwood pulp and the mills were kept working at high pressure. With the easing off of the spot news market there was, during the latter part of the year, a falling off in both the demand and the market price of groundwood pulp, counteracted, however, in part, by conditions of appreciable extent. The abnormal prices prevailing throughout a large part of the year were absorbed to some considerable extent by higher production costs.

The export demand was well maintained during the year, as is indicated in the accompanying table, showing exports month by month in comparison with those of the preceding year:



J. A. BOTHWELL, Chairman Mechanical Pulp Section.

Exports of Mechanical Pulp by Months.

1919-1920.

	1919.		1920	
	Cwts.	$	Cwts.	$
January . . .	274,384	262,322	609,20	972,574
February . . .	164,673	217,421	266,826	472,383
March	169,451	226,554	289,092	562,308
April	161,449	217,711	198,664	506,369
May	255,622	356,905	279,439	779,710
June	581,151	619,981	892,309	2,136,767
July	346,174	436,604	838,118	2,528,993
August	387,435	475,735	816,081	2,809,266
September . .	415,046	511,402	424,689	1,877,053
October . . .	2,038,193	1,942,716	536,329	1,986,807
November . .	894,206	997,408	263,976	1,016,184
December . . .	541,240	817,692	*.....	.....
Total . . .	6,231,024	7,082,451	5,414,729	15,648,424

* Figures not available.

The heavy exportation of groundwood in October 1919 as compared with October 1920 is accounted for by the fact that in the former month heavy accumulations of Canadian stocks found an outlet in England and that no such accumulations have since been made in this country.

The bulk of the last year's exports of this grade of pulp, as in former years, were sent to the United States, although a considerable proportion of them were sent to the United Kingdom. The outlook is for an increased development of the United Kingdom trade.

The unusual prosperity enjoyed by this branch of the industry during the middle part of 1920 led to the formation of many new enterprises for the purpose of manufacturing mechanical pulp, some of which will undoubtedly be brought to the producing stage. Not all of the proposed developments can be said to be based on sound economic lines and it is altogether likely that many of them will never get beyond the promotion stage.

The year closed with this branch of the industry in a healthful condition and with prospects reasonably good for the future.

The Section is indebted to the Association's executive officers for much helpful assistance throughout the year and for their assistance in promoting a spirit of cooperation among the members which has proved of great service.

BOOK AND WRITING SECTION.

By H. F. E. KENT, Chairman.

The Book & Writing Section are pleased to report that business has been very satisfactory for the past year; the demand for their product for the first ten months was unprecedented and it was impossible to satisfy the buyers. During the last two months, the demand eased off and the mills have been able to ship much more promptly.

The Section held eight meetings during the year at nearly all of which there was a full representation of its members. The spirit of co-operation shown is most



H. F. E. KENT, Chairman Book and Writing Section.

encouraging and is helping to get this section in a position to meet all competition and do its part in making Canada the greatest paper-making country in the world.

Raw materials were very scarce and the qualities were much below normal, making it difficult for the mills to maintain uniformity in grades. Coal was very hard to procure, prices extremely high, and the quality poor. Wages during the year increased 50 p.c., all of which necessitated very much higher selling prices than previously.

The mills, in order to meet the unusual demand made by the home market for Book and Writing paper, had to curtail their export business during the year although, owing to the world-wide shortage of this commodity, they could have secured better prices from outside. They felt it, however, a national duty to keep their own market supplied first.

The Section had several meetings with the Canadian Paper Trade Association during the year to discuss conditions and to try to get business on a more uniform basis. These meetings were fully attended and the results will prove to be very beneficial to both the manufacturers and the Merchants Association.

While business during the past year has been very satisfactory, the indications are that the first month or two of this year will be rather quiet. There will be, in our opinion, before the first quarter has passed, a decided improvement and it will be found that this year will work out as satisfactory as the past year.

THE BOARD SECTION.

By JOHN F. TAYLOR, Chairman.

The past twelve months has been a year of extremes commencing with exceptional strength and a strong demand continuously in evidence until the last three months.

The demand for the first half of the year was far greater than the supply and the situation even as late as August was so urgent as to influence the box manufacturers to ask that export shipments be diverted for home consumption.

The manufacture of boards in 1919 in the United States, according to the Federal Trade Commission reports, showed it to be 1,950,037 tons. The production in Canada of all classes of board for the same period amounted to 137,678 or roughly, 7 per cent of the U. S. total.

In the early part of the year, therefore, on account of the tremendous demand in the United States market prices for all classes of boards, rose in a very generous manner. Towards the Fall, however, a slackening of business in the United States caused an important drop in the consumption of board.

In fact, in all lines there was a cessation in buying resulting in the closing down of a great many of the board mills and the usual attempts to capture the limited Canadian market by forced selling methods.

Market conditions have now brought prices to a much lower basis than heretofore and there is every evidence of a resumption of trade within a month or sixty days which, while not promising to be on the scale of the previous year, will provide business for mills both in the United States and Canada in sufficient volume to keep them properly employed.

The Board Section has held regular meetings, some 10 gatherings taking place during the twelve months during which time the opportunity has been taken to meet the box makers of Canada in an endeavor to facilitate manufacturing and trading conditions and such conferences as were held indicated that the best possible spirit exists between the board mills and their customers.



JOHN F. TAYLOR, Chairman Board Section.

There is undoubtedly some work to be done between the box makers and the board mills in regard to standardization of sizes and it has also been urged during the year on behalf of the manufacturers that a great deal of the fluctuations in the market could be avoided by the institution of quantity contracts.

As regards future development of the board business it may be mentioned that several mills are overhauling and installing new equipment that will undoubtedly increase production during the present year. Whether such plants as those manufacturing wallboard and container boards will benefit to the fullest extent from a revival of trade remains to be seen.

THE WOODLANDS SECTION.

By J. B. WHITE, Chairman.

The past year has seen an increase in the number of members of the Woodlands Section and a greater interest taken in the improvement of logging conditions in all parts of the country.

A largely attended meeting of the members was held in Toronto on December 8th and 9th at which time some very interesting papers were read on Swedish conditions of lumbering and also interesting papers having to do with Canadian conditions of forest lands.

An interesting development of the present day methods of logging has been the entrance of the airmen as a factor in woodlands work. Unquestionably the time is at hand when a great deal more use will be made of the airmen than at present in fire patrol and map work and while in an experimental stage at the present time as regards equipment flying is rapidly becoming a perfected science.

Several members of the Woodlands Section have

expressed the desire to have a medium for exchanging ideas in regard to equipment used in logging and bush work.

During the year the American Association has also formed a Woodlands Section and there is every possibility of a certain degree of cooperation between the two organizations.

THE COATED PAPER SECTION.

By GEO W. PAULINE, Chairman.

The Coated Paper mills were all fully employed throughout 1920, but were severely handicapped in supplying the demand, owing to shortage of paper stock.

Prices advanced during the year, until August 1st, from which date they remained stationary until the end of the year.

New business has eased off to some extent, and consequently the mills are gradually catching up on back orders.

There is an optimistic feeling regarding prospects for the current year, which we trust will be fully realized.

THE FELT PAPER SECTION.

By W. R. McNEIL, Chairman.

The year 1920 has been a very eventful year for the felt paper mills, comprising the Felt Section of the Canadian Pulp & Paper Association.

As on other lines of paper, the demand for felt paper during most of the year exceeded the supply, and to meet this increased demand several of the mills have added new equipment and are now ready to turn out a materially larger daily tonnage.

The future of the felt paper business in Canada looks very bright because at least 90 per cent of the production of felt paper is converted into materials used for building purposes and the demand for new buildings all over the Dominion will not be fully met for some time.

Our Association Meetings have been held regularly each month and with very few exceptions have been attended by 100 per cent of its members, which indicates the interest being taken in our Association.

To Mr. A. L. Dawe, we again express our gratitude for his unceasing efforts in helping along the success of our Section in so many different ways.



W. R. McNEIL, Chairman Felt Paper Section.

THE WRAPPING PAPER SECTION.

By F. J. CAMPBELL, Chairman.

During the whole of 1920 the Wrapping Mills were producing to capacity and found an active demand for their output. For the first six months of the year costs, and with them prices, kept steadily advancing: the maximum being reached by the end of June. For the remainder of the year there was an active market at steady prices, and it was not until December that any slackening off was apparent.



F. J. CAMPBELL, Chairman Wrapping Paper Section.

The advance in freight rates during the year was a very serious matter on such a heavy commodity as wrapping paper, and it is to be hoped that with the start already made freight rates will soon reach a more reasonable level, and that the Government Railways may facilitate this by a reasonable gain in efficiency.

Wrapping papers like all other commodities are now facing deflation and if this is met with courage and common sense, no one should fear the ultimate result. By lowering prices gradually, buyers and others carrying stocks will be saved from serious loss, while the mills should be able to keep running with a fair return.

All the mills are in a strong position, and by exercising reasonable care it would appear as if satisfactory results could be looked for during the year 1921.

Meetings of the Section were held throughout the year and it is satisfactory to report that trade customs and terms are now firmly established in the wrapping paper trade.

THE TECHNICAL SECTION.

By L. H. SHIPMAN, Chairman.

I take great pleasure in rendering herewith a statement of the progress of the Canadian Technical Section during the year 1920. It is indeed a pleasure as retiring Chairman to be able to state that the momentum acquired in past years through the excellent leadership of our officers of those years has not depreciated and that there is no apparent tendency as yet of this section to get into a rut. We have truly progressed during the year and all signs indicate our Section to be in a very healthy state of growth and of general usefulness to the parent Association, to the industry as a whole and to our individual members.

General Meetings.

There have been held two general meetings, the annual meeting in Montreal last January, and the Summer meeting in Western territory, as the guests of the Spanish River Company and International Nickel Company. These were both successfully carried out and helped to increase the general acquaintanceship of



L. H. SHIPMAN, Chairman Technical Section.

members with each other, all of which is a factor in the fostering of that spirit of friendly co-operation between members which is so vital to the successful functioning of our Section.

We had some very timely discussions at the January meeting, particularly on the question of wide and slow versus narrow and fast newsprint machines, the discussions being led by Mr. R. A. McInnis, of Abitibi, and Mr. John Ball, of Price Bros., and this discussion has led to others between members later on during the year.

Besides this main discussion we had a very interesting paper by Mr. F. J. Hoxie on the Protection of Wood Piles, which brought out a very good discussion.

The Summer Meeting consisted of a visit to the Plants of the Spanish River Pulp & Paper Mills and the International Nickel Co. This meeting like our usual Summer meetings was given over more to mill visiting and the personal exchanging of experiences between members than to elaborate formal discussions and I believe served its purpose well.

Mr. H. S. Taylor gave a very fine paper on "The Heat Insulation Value of Gypsum Roofs," illustrated by stereoptican views, and Prof. Ralph H. McKee, a very instructive paper on the "Utilization of Waste Sulphite Liquor for Alcohol and Fuel.

At Copper Cliff, Ontario, the smelting of copper-nickel ore was thoroughly demonstrated by the International Nickel Co., and the question thoroughly discussed of the utilization of its waste gases to recover the SO_2 present for use in sulphite manufacture.

Work of Standing Committees.

Our standing committees have for the most part made distinct progress. I will not attempt here to enumerate the work of the committees during the past year but will leave this to be shown for itself in their various reports which will be presented to our annual meeting on January 19 & 20, 1921.

I do wish to commend very highly, however, the efforts which have been put forth by the Committee of Education with special reference to the Text Books, for the industry. This committee has met and overcome obstacle after obstacle and deserves the praise and whole hearted support not only of our Technical Section but of our whole industry. It will have a very interesting report to present at the annual meeting.

Two other committees which have been doing especially hard and conscientious work are the committee on Testing Moisture in Pulp and the committee on Mechanical Standards.

Membership.

Our membership has grown steadily throughout the year as is shown by the following table of comparison:

	Jan. 1, 1920	Jan. 1, 1921
Full members	98	108
Associate members	12	14
Junior members	17	27
Student members	14	17
Total	143	166

Summer Students.

The plan which our Section undertook two years ago, in co-operation with the mills during the Summer vacation, has been carried on successfully this year, and it now seems evident that ultimately the industry will obtain some valuable men in this way who otherwise might have been led into entering other fields of manufacture.

The essays which have been turned over to the committee of Judges for awarding the three prizes of the Technical Sections have in the main seemed to be of a higher order of merit than the average of those of last year.

This activity of the Section promises well for future results. There were 41 students listed on the records of the Technical Section as undertaking Summer work in the mills during the Summer of 1920 and from these students, fourteen essays were received for the prize competition.

Technical Section Research Dept.

Finally I wish to direct your attention to a piece of work of the Technical Section which gives promise of being one of its most important phases of work, given proper support. This is the development which has arisen through the previous efforts of our former committee entitled The Advisory Committee to Forest Products Laboratory.

My predecessor in office, Mr. Stadler, in his report last year stated that "the Executive of our parent Association had authorized a substantial contribution towards the Superintendence of the Forest Products Laboratory" and since his report we have been advised that such contribution is not acceptable by the Government. It has seemed as though the establishment by ourselves of an effective research organization working on the technical problems of our industry, through the rehabilitation of the pulp and paper section of the Forest Products Laboratory was almost a hopeless task.

Recent developments, however, indicate that we have a possible solution to this problem.

Early in the year the Executive of the Main Association instructed your Chairman to appoint a committee from the Technical Section which should make a thorough investigation of the whole situation and report with recommendations to the Main Association at its annual meeting in 1921.

Your Chairman thought it wise to defer the appointment of such committee until after the Summer meeting of 1920 and during the intervening months to get opinions from various members of the Technical Section and to arrange for a discussion of this question at the Summer Meeting. This was done and the concensus of opinion brought out before the Summer meeting was to the effect:—

That knowledge of the actual accomplishments of the Forest Products Laboratory to date was insufficiently spread among our members.

That the benefits of an Association laboratory were not clearly enough understood by the majority of our manufacturers who would be asked to support such a laboratory, and finally,

That a definite scheme for the accomplishment of the purpose in hand had never been presented by anyone.

It was further shown that the idea would very likely be further along at the annual 1921 meeting if, instead of having a Technical Section committee report to the Main Association, a joint committee be appointed one-half from the Technical Section and one-half from the manufacturers.

This was done and I am very much pleased to report that this committee has a very definite program to present to the Association and through it to the industry, at our forthcoming annual meeting.

While this annual report should be confined to the activities of the Technical Section during the past year I feel I would be remiss in my duty as Chairman, while the above important matter is up for decision if I did not point out here the manner in which a well conducted Association research laboratory could be of very particular benefit to the industry. Not all our Section members are Technical men, that is, trained in the laws of physics and chemistry underlying our industry, and it is to these non-technical men in particular that I wish to point out the advantages which might accrue from our having our own research organization.

There are innumerable scientific problems the solution of which is possible and will immediately react to distinct advances in our manufacturing processes. I will go into details with one alone to show the possibilities.

We are most of us familiar with the fact that about a year ago the International Nickel Co. undertook an investigation upon the feasibility of erecting a plant to recover and liquefy the SO_2 being wasted to the air in their waste smelter gases. Some of us are familiar with the results of the investigation, namely, that the cost of this recovery was such that the price to the paper mills of the recovered liquid SO_2 was not sufficiently below the ruling price of sulphur to warrant the mills interested in giving up the use of powdered sulphur.

This decision was made because the present knowledge of sulphite making made us sure of only one benefit; namely, the elimination of our sulphur burning apparatus and process. This saving alone would not warrant any mill to get into the position of being tied up to liquid SO_2 with always a possibility in view of a large drop in the price of sulphur.

There is lacking to the trade a piece of information which if it had been available might have made the decision favorable to the use of liquid SO_2 even at a price higher than that of powdered sulphur. There are facts to be had through a research organization on this subject which may entirely change our present ideas on sulphite making.

We have in our industry advocates of cooking with high strengths of sulphite acid and on the other side those who are as strongly convinced that high strengths are not economical. With liquid SO_2 available we could make acid of strengths hitherto physically and chemically impossible because from burning sulphur, a fraction over 20 per cent SO_2 is the theoretically strongest gas which can be produced. We technical men know that there is a saturation limit with 20 per cent gas which would prevent the acid absorbing more than a very definite strength of SO_2, but that with 100 per cent gas from liquid SO_2 this saturation point would be raised very materially, thus allowing us to cook with acid strengths unheard of to date.

But what would this ability avail us? Theoretically, we would be able to reduce our cooking temperatures to a point where we might get increased yields of 15-25 per cent; also we might get pulp out of our digesters in six or seven hours which would be as easy bleaching as that made today in a twelve hour cook, and which would be nearly twice as strong fibred.

This, however, is theory, and we know that these new conditions would entail new problems. For instance, our present sulphite bronze fittings would not stand up under the strain of high temperature and pressure in presence of this extremely high strength acid. Again, at the end of the cook, there would be so much SO_2 left in the acid that special new arrangements would have to be devised for its recovery; again, the action of 100 per cent SO_2 gas in our tower acid systems has not been determined, and the question remains to be determined whether under this condition of gas it would be advisable to make the strong acid in the tower or the digester itself.

With the possibilities of enormously increased yields, materially reduced steam consumption and cooking time, however, this becomes immediately a problem for a well organized association research department. Since it is, in its entirety, somewhat too large a problem for the ordinary mill technical department to hope to tackle and solve.

I have gone into this amount of detail merely to show some of you how such a scheme as will be presented by your joint committee can be made to be of special vital benefit and importance to our industry and I sincerely hope and trust that you men of the Technical Section and particularly you manufacturers will see into the future enough to realize that with

proper financial backing, plus hearty cooperation—and without this latter the scheme will fall—we have a wonderful opportunity to put this Canadian industry far in the lead in its own field. Problems exist in our industry in all its branches which when solved will prove as revolutionary as the one outlined above.

Finally I wish to thank most heartily all the members of the executive council of the Technical Section for their very enthusiastic support during the past year. Every one, when called upon, has done his part in full measure, and particularly do I feel grateful to our Secretary Mr. Dawe, for his most helpful guidance in the performance of my duties as your Chairman.

THE TRANSPORTATION DEPARTMENT.

By G. P. RUICKBIE, in charge.

During the past year your transportation department has given close attention to all transportation matters, affecting the industry and begs to report as follows:

In July last, the Railway Association of Canada, on behalf of all Canadian Railways, made application to the Board of Railway Commissioners, for a general increase of 40 p.c. in freight rates, it being claimed this amount was necessary to meet increased wages and operating expenses. Your Executive decided that this Association would not oppose such general increase as was found necessary, providing this industry was not singled out for a higher increase than others. Hearings were held by the Board of Railway Commissioners in Ottawa, commencing August 10th, and as a result Canadian Railways were allowed to increase rates in Canada, East of Fort William 40 p.c.; West of Fort William 30 p.c. New rates on this basis became effective September 13th, 1920. The Order further stated that effective January 1st, 1921, the percentages of increases would be reduced to 35 p.c. East of Fort William and 30 p.c. West. Adjustment has been made to this basis.

Several exceptions were made to this general increase, the following being the interest to our members:

Crushed Stone .....No increase.

Coal—

Rates 80 cents per ton or less, increase 10 cents per ton.
" over 80 cents not over $1.50 " 15 " " "
" over $1.50 per ton " 20 " " "

No modification of the above increase on coal was ordered for January 1st, 1921.

At the time the application of the Canadian Railways for increased rates, was being considered in Ottawa, the Interstate Commerce Commission at Washington announced that United States Railways would be permitted increases in their rates sufficient to allow them net earnings equal to six percent of the valuation set for the various groups of Railways by the Interstate Commerce Commission, as provided for in the Transportation Act of 1920. Under this Order Railways operating in Official Classification territory (roughly lines East of Chicago) were permitted an increase of 40 p.c.; Railways in Western Classification territory 35 p.c, and Southern Classification territory 25 p.c. On through rates between two of these territories an increase of thirty three and one third per cent was allowed. Under this Order the proportions accruing to United States Railways on shipments to and from Canada were to be increased the same percentages as domestic shipments and consequently, with the approval of the Board of Railway Commissioners for Canada, through rates between points in United States and points in Canada were increased in some cases forty per cent, in others thirty three and one third per cent. No change was ordered in these International rates, effective January 1st, and no exceptions were made of any particular commodities, so that the rates on coal from U. S. Mines to the Canadian Frontier were increased approximately 40 p.c., while the rates from the Frontier to the Mills were increased the specific amounts allowed by the Canadian Board.

During the past year the Transportation Committee appointed by your Executive with Mr. Guy Tombs as Chairman, has held several meetings and has endeavored to look after the interests of the industry as a whole as far as freight rates are concerned. During the hearing before the Board of Railway Commissioners in Ottawa last summer strong representations were made that instead of rates on woodpulp and paper to United States points being increased 40 p.c., the basic rates should be 40 p.c. and rates from other mills adjusted on the proper differences over or under the basic rates. Favorable consideration was promised by the Railways as soon as the United States Railways took similar action regarding rates from New England mills, and while it has taken longer than we anticipated to arrange such adjustment we are in hopes it will not be much longer delayed.

An appeal from the Order of the Board of Railway Commissioners was taken by the Government of Manitoba and Saskatchewan to the Governor-in-Council, but the Order allowing the Railways to increase their rates stands. Complaints have also been made by British Columbia interests against rates applicable in that Province, and by the Governments of Nova Scotia and New Brunswick jointly with local business interests, against present rates to and from the Maritime Provinces. The Western Governments allege that improper discrimination exists in that rates in that territory are higher than in Eastern Canada. The Governor-in-Council has suggested that the Board should investigate this feature. In view of those various complaints the Board of Railway Commissioners has announced that hearings will be held at various points throughout Canada, starting in April next, to investigate freight rates generally, and all having grievances will therefor have an opportunity of being heard.

Your Transportation Committee decided, at a recent meeting that rates at present being charged our members on pulpwood and other raw materials should be carefully analysed. In order to make a proper survey of the situation it will be necessary to get considerable information from the mills. Some of this has already been asked for and your cooperation in furnishing it is solicited.

Only five members have so far taken advantage of this service and of this number, two have preferred to file their own claims with the railways. In such cases the expense bills are returned to them after auditing, with particulars of any overcharges discovered, and reference to the freight tariffs authorizing the rates which should have been charged. If the amounts of such overcharges were added to the above figures the totals would be considerably greater.

Special care is taken to see that any claims entered are based strictly on the legal tariff rates, thus avoiding any friction with the Railways Claims Departments. The three claims above referred to as being withdrawn were originally filed with the Railways owing to a misunderstanding as to routing. When it

was pointed out that the routes over which the shipments travelled had been specified by the shippers, and the Railways were not responsible for the misrouting, the claims were withdrawn.

The number of claims entered does not represent the number of bills on which overcharges occurred, as where a number of shipments of the same commodities, moving between the same stations on account of the same firm, have been overcharged, one claim is very often made to cover all such shipments.

While rates which are being charged may be in accordance with published tariffs, it sometimes happens that they are on an improper basis, having in mind the service performed and rates in other localities on the same commodities. In several such cases this department has been instrumental in arranging reductions, which, of course, are benefits of a permanent nature to the mills interested.

With the great number of changes which have occured in freight rates in recent years, tariffs are very complicated, and as the indications are that in the future still further adjustments will be made it would seem important that all freight bills should be carefully checked.

Requests for freight rates, tracing shipments, and other information are being received from a number of our members, from time to time, and are being given careful attention.

On March 4th last the Executive authorized this department to audit inward freight bills for any members desiring to avail themselves of the service. A nominal charge of one cent per bill audited, was decided upon. Since that time a total of 11,350 bills have been audited, the amount realized by the Association for this service being $113.50 The following figures will give some idea as to how this arrangement is working out:—

Total number of bills audited 11,350

	Number.	Amount.
Total claims entered	51	$3,498.13
Total claims paid	22	$1,283.58
" " withdrawn . . .	4	213.56
" " outstanding . . .	26	2,000.99
	51	$3,498.13

CATALOGS RECEIVED.

Among the catalogs and bulletins recently received by the Pulp and Paper Magazine are the following: They may be obtained from the firms mentioned.

Worthington Pump and Machinery Corp., 115 Broadway, New York—Catalog of 126 pages showing details of most varieties of pumps, condensers, compressors, valves, etc.

Mills Works and Machinery, Ltd., Pont Rouge, Que.—A 16-page booklet descriptive of the Hardy Paper Stock Regulator, with illustrations and explanations.

Whatman's Filter Papers—A list of papers (and their prices) produced by the well known firm of W. and R. Balston, Ltd., and distributed in North America by H. Reeve Angel & Co., 7-11 Spruce St., New York.

News from Our Advertisers

The Gibbs-Brower Company.

The Gibbs-Brower Company, who are perhaps, best known to the pulp and paper industry in Canada and the United States as machinery builders have opened a pulp and paper mill brokerage department which will be in direct charge of Mr. Ogden Brower, Jr. The headquarters of this department will be at 261 Broadway, New York, with a Western office at 181 Quincey Street, Chicago.

Heretofore there has been no firm or individual who acted as a broker specializing in pulp and paper mill properties. Gibbs-Brower Company realized that buyers did not have the time to go out and investigate the different properties that might be offered in the advertising columns of the pulp and paper journals or otherwise and decided that buyers would appreciate the gathering of all data regarding mills listed for sale so that the buyer could, from the information at hand, concentrate his attention on the ones that were suited to his requirements. They list all mills offered for sale, investigate these properties and get complete data as to their equipment, capacity, general condition, facilities for receiving raw material and shipping the finished product and all other matter that would be of interest to a prospective buyer.

Both Mr. O. Brower Sr., and Mr. O. Brower, Jr., are particularly well equipped to manage a department of this kind. They have been selling machinery to the pulp and paper mills for a great many years and have an intimate and extensive knowledge of the industry in the United States and Canada. They advise us that this department has been particularly successful and that both buyers and sellers have appreciated the assistance and co-operation they have received. This department is being extended to cover Canada intensively and Gibbs-Brower Co., should be of considerable use to Canadian firms having properties for sale or to companies or individuals desiring to purchase plants.

International Business Machines Convention.

Optimism was the keynote at the Convention of the Canadian Sales force of the International Business Machines Company held at the offices of the Company, Royce and Campbell Avenues, Toronto, in the week of January 3rd, 1921.

About 75 salesmen in all were in attendance at the Convention. They represented the three well-known divisions of the Company—International Time Recorders, International Dayton Scales and International Tabulating and Sorting Machines.

Figures presented at the Convention showed that the Canadian Organization held all sales records for 1920 against the sales forces of the American firms manufacturing similar products. In fact, the Canadian organization has lead the entire world in sales, on percentage of quota, for four successive years. The Canadian boys, naturally felt elated and justifiably so in view of the fact that the Sales forces in the United States and England number some 1,100 men, and that all quotas are based on the same figures, namely, of population.

One of the neatest holiday remembrances which reached our office is from the English China Clays Sales Corporation, 33 West 42nd Street, New York City. This is in the form of a very attractive and substantial paper clip.

The Paper Machine—Its History and Future Development

An Historical Sketch.

The first paper machine using a continuous wire for forming a sheet of paper was patented in 1799 by Nicholas Louis Robert of France.

He turned the patents over to his employer, a man named Didot. Didot did not push the matter except to interest one John Gamble, an Englishman, and Gamble in turn interested the great stationers of the time and the largest papermakers in England. Henry and Sealy Fourdrinier.

The Fourdriniers and Gamble took the machine to the Halls Engineering Establishment at Dartford, in Kent, England, which was in charge of a young man named Bryan Donkin. Bryan Donkin found a very interesting problem but one that had not been worked out, and he really is the first man to develop a machine for making paper.

Donkin worked with many trials and tribulations for about three years, at the end of which time, however, he did make a continuous, unbroken web of paper on the machine that took the name from his partners, the Fourdrinier brothers. This machine was started about 1803.

It does not seem clear that Donkin managed to get dryers on the machine until a very much later date. This is easily understood from the fact that the aim was to form a sheet of paper and go on drying it in lofts as with hand made paper. Somewhere in the neighborhood of 1815 to 1817 Donkin not only made copper dryers, but had steam in them, and further made calenders, so that by 1823 he had a Fourdrinier machine practically, so far as fundamentals are concerned, that we have today. It was as late as 1823 before a full-fledged paper machine was running in France.

While Donkin was fussing and perfecting his Fourdrinier one John Dickinson was doing the same thing with a cylinder mold, and he made a paper machine and it was Dickinson's machine which first came to America to the Brandywine mill in Delaware owned by a Mr. Gilpin. This was in 1817, and this machine did not have dryers.

In 1827 the first Fourdrinier machine came to America. It was built by Bryan Donkin and was delivered in October of that year and set up at Saugerties, N. Y. In the same year another machine arrived during the month of December, and was set up at South Windham, Conn.

The first Fourdrinier actually built in this country seemed to have been built by a concern called Phelps & Spoffard in Philadelphia, Pa., having a wire, presses and dryers. The next machines seemed to have been built at Brattleboro, Vt., then Goddard & Rice of Worcester and Smith & Winchester of South Windham, Conn.

There have been a good many builders since, of those of the early days two stand out as really having added to the construction and development of the machine beyond any others of the older time builders, viz: Nelson Gavitt of Philadelphia, Pa. and I. L. Severns.

The builders of the present day are so well known to you all as not to require mentioning. Almost every one of the present builders, however, have their origin either directly back in the names I already mentioned or else are the product of the vicinity in which they were located, first doing repair work, and then building parts of paper machines, until they drifted into devoting their entire attention to them.

Many names have arisen in the last 25 years which have added greatly to the development of the paper machine, but it is too soon to mention them. One, however, passed to his reward, I think it only fair to name. Mr. Thomas H. Savery of Wilmington, Del., certainly devoted a great deal of his life to bettering the conditions of the paper making machine.

The dream of all these men, including the original inventor, was making paper at an ever-increasing speed, hampered by their machine shop facilities, hampered by prejudices of papermakers; nevertheless they did each contribute and so far as they could see went practically to the limit.

You will be interested when you look at the picture of Bryan Donkin's machine, and think of the change between his time and ours, and you will be forced to speculate as to what the paper machine will be a hundred years hence.

It is natural to the average human animal to say, "It can't be done," and this method of procedure was no different 100 years ago than now. Robert, the prophet and inventor, broke his pocket book and died a subject of charity because the world practically said paper "could only be made by hand."

So today the future of the paper machine is confused to our view because in the discussion, facts are distorted, assumptions made on one side that are either not true nor logical and are continually adhered to, because many are merely interested in sustaining and proving "it can't be done," and on the other side we have equally wild statements and assumptions from those in favor of the proposition, whatever it may be.

We are prone to forget that if some one fundamental link in such an argument as the ultimate speed at which paper can be made should be found incorrect and then corrected, that the whole structure of our opinions would have to be rebuilt, and, my friends, just such things have occurred in the past and are happening today.

I have been manufacturing paper making machines for thirty-two years, and have devoted all by life to seeking the principles that underlay the subject of making paper at high speeds. Handicapped at every turn by the differences of opinion coming from equally good papermakers, men who had the confidence and the respect of the trade, whose opinions were the last word with a large following, and many times in the past I have been discouraged and have expressed myself in the following way, "that I could draw a specification for a practical papermaker acknowledged by many without a peer, and have the specification

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*Address delivered by Stuart D. Lansing, President of The Bagley and Sewall Company before The American Pulp and Paper Mills Superintendents' Association, at Niagara Falls, New York, January 8, 1921.

absolutely according to his beliefs, and then submit same to an equally admired papermaker with an equally large following who would promptly condemn the whole thing almost to a point of saving a machine so built would not even make paper.

Our world of paper making has rocked backward and forward in its opinion, in the past, on many subjects that now seem almost absurd, viewing them from the light of subsequent positive knowledge, and to get a clear idea of our own limitations let me illustrate some of the controversies that we, the men present here today, have in the past indulged in, when today we can't even get a discussion upon.

When I first began my checkered career searching for facts about papermaking I found practically all papermakers declared that a Knocker screen was the only method possible to screen stock properly. The old Gould screen was the favorite. It had the merit of hanging together better than others, with its great foundation plates 4'' thick and massive framework, and could be heard roaring 2 miles off.

The poor man named Victory, the inventor of the first operative Bellows screen, ate snowballs to sustain life. My own company spent thousands of dollars trying to help him, but the prejudices of papermakers were too much for him and us, and the thing was condemned. John Warren, having a little faith left, substituted a cam for the eccentric cut in the driving shaft, and Presto! Bellows screens were all the rage, and nothing else was possible, and immediately the Knocker screen supporters had to fall by the wayside. Gotham get rich; John Warren got nothing out of it.

Rotary screens not so very long ago were deemed impossible on paper machines — well enough for sulphite, but keep them off the machines. Now its rotary screens on paper machines, and only a few objectors.

Shaking frames — our world rocked between the form of shaking mechanism some 20 years ago and has continued until now, when we begin to see that no shake at all may be the eventual outcome of the controversy.

I well recall one eminent engineer who proved to papermakers that the old shake, that had its stand starting at the floor, passed the paper stock in its movement from low to high, back to low again, thus making the sheet thicker on the edges of the wire. He brought out a patent that made the wire practically horizontal in its movement. I developed a roller shake that had to be horizontal as long as the rollers would last. Another brought out a vibratory shake that swung from high to low to high, making the sheet thicker at the middle. You smile now because neither idea was right or wrong, and we agree that it is immaterial, and perhaps we are at the last of shaking frames anyway.

Speeds changes — you must smile to think of what we deemed necessary 25 years ago, tons and tons of cast iron step pulleys and cones, conical belt drives, etc., all now gone, superseded by ''complete omission,'' a variable speed engine or motor is all that is required, and possibly we have arrived at a point where separate motors will be hereafter used for each separate part of the machine. But don't let us forget that the first machine to operate at 1,000 feet has a much despised but well built Marshall drive on it.

Let me take save-alls under a wire, wood, galvanized, copper or what not, they had to be used. The wire would fill with stuff dropping through the wire or from Heaven itself. We could not believe the simple fact that water that went once through a wire on its forward movement would surely after thus being strained go through the wire on its return, and yet today no one would think of going back to save-alls for white water under the wire. If he has ever run a machine without them.

I have said enough to show you that we are progressing about as fast as we get rid of our impedimenta, our unnecessary things, and our conclusions nowadays want to be modified a little in view of the facts that 20-30 years ago we were staunch adherents of all of these four illustrations each being on one side or the other of the controversies.

Let all of this show us that none of us knows all there is of paper making, and in all probability solution will come from unexpected sources.

The present widely advertised excellent contributions to the controversy of Speed vs Width recall the days 18 to 20 years ago when the trade divided itself over Width vs Speed. Curious, is it not, that the present day controversy calls the 164'' machine the narrow machine and over 200'' a wide machine, whereas in 1900 to 1905 the 164'' was the huge, elephantine monstrosity that was to be introduced. George Parks, of blessed memory, said up to his dying day that he preferred 86'' to 90'' machines making one roll of news to the wider machines, and yet the standard machine in our own factories is the 164'' wire. Have it with whatever length of wire you please, as many presses and dryers as you will, the 164'' standard we maintain in order to expedite our manufacturing.

So history but repeats itself, only our monster of 1900 has become the common size, and there is a new monster.

These contributions or essays are very interesting, and I refrain from saying amusing, in the present controversy, and as I must speak of them I pray you to believe I mean no reflection whatsoever upon the authors, because you and I are in the same rut in regard to many things, and it is easier to see the motes in your brother's eye than in your own, and none of us are logical at all times, and sometimes I think in regard to the papermaking game that Shakespeare's Puck'' has the best job, as he sits off and views my errors and yours, and your worries and my worries over things, mostly because we don't understand them, and he says, ''What fools ye mortals be.''

Let me illustrate the difficulties some of the recent authors labor under and honestly support their contentions with heart and soul. The first prize recently granted to the writer of an article on Speed vs Width makes a comparison between a 158'' machine making 80 tons daily and a 234'' making 72 tons, and bases his argument apparently on this comparison.

What a faulty conclusion one must reach, when the facts are, that 158'' machines do not as yet make 80 tons daily, and 72 tons for a 234'' would be a huge joke. I have a 204'' machine running at 750 feet making 85 tons daily and has made 90 tons, and if anyone will give me an order for a 234'' machine and it doesn't make over 100 tons daily I will feel so badly disappointed that I will ask the party never to let me build another machine for him.

Many writers in these articles seem to agree that 600 to 650 is the speed where wire, presses and winders will permit paper to be made without waste, etc. My friends, in 1897 the majority of papermakers said the same thing, their limit of speed was about 400 because you could not take care of the paper made, and 100''

the limit in width because the winder shaft on the old single drum winder would spring and the rolls run together. All of this was true, positively true, but then John Warren came to us with his 2 drum winder idea, and both the speed and width questions were solved at one crack so far as taking care of the paper was concerned, and the same old machine trotted right up to 500 feet per minute. I cite this because one man says 1,000 feet is impracticable because one winder will not take care of the paper, and he is just where we all were in 1895.

Another man speaks of power as 2½ H.P. per inch of trim on slow speeds, and 4 H.P. per inch of trim on a flyer, as he calls it. Now the facts are, we are operating daily a machine 112'' wire at 1,000 feet per minute and taking 256 H.P., or just about 3 H.P. per inch of trim, and this is measured by electrical instruments and no doubt about the readings, and I submit this machine is some ''flyer.''

We have a 164'' machine running about 800 feet taking 2¼ H.P. per inch of trim, and a machine 145'' running at 600 feet taking less than 1-3 H.P. per inch of trim. I cite these as mere illustrations of men befogging the situation and themselves by careless statements, not being in touch with the whole field.

One word more to emphasize my point: One writer of great and goodly reputation, for whom I have the highest regard, says that ''in case of a level wire running 600 feet per minute the stock could not possibly be delivered on the wire at any such rate and the result would be that the wire would be jerked out from under the fibres before they settled into formation, standing the fibres all on end, making a bad looking sheet and causing many breaks.'' And yet we not only run machines level at 600 feet but the machine illustrated in the bulletin distributed here shows the machine operating at 1,000 feet and the wire level inclined upward.

I could go on for hours showing how little hope the average human has in his breast, but enough to show the papermakers are inclined to be pessimistic and help to clog the very progress they desire.

Now let me illustrate my own side of the question of progress. Recently I had occasion to review the matter of the deckle washing box, and I found beginning in 1889, with a sheet of brass on the inside of the wheel, we made sixteen different steps during 30 years before we developed a box that would wash a deckle strap and prevent the breaking down of the sheet from slugs from this particular source, sixteen positive efforts, and each time an improvement, and yet we are no more stupid than other people. We got the box when we finally ''got it'', and that's very largely what I feel about all these points in connection with which men use that fearful phrase, ''it can't be done''. ''It can't be done'' has wrecked more than one life and industry.

Now my No. 1 prophecy — I prophesy that we will see paper, I mean the good commercial article, made at 1,500 and 2,000 feet per minute, not this year or next perhaps, but not so far off but that the majority here will live to see it.

Who that has been at Wausau Sulphate Fibre Co. ever expected to live to see 1,000 feet made, but it is being made and no guess work nor uncertainty about it. We have learned many things from this experience and are engaged in so bettering every detail in our machines that we believe, truly believe, that we will exceed 1,000 feet within 15 months by a substantial amount.

I must be pardoned if I seem to be advertising my own machines. They are the ones I know and must speak of.

My beliefs are

(1) The papermaking world is simply beginning to understand fully the fundamentals of the art, and the possibilities of development.

(2) The repeated efforts of machine builders to improve during the last 30 years are beginning to bring many parts in a paper machine to a satisfactory operating condition, and the improvements are continuing.

(3) There is somewhat less of the ''can't be done'' feeling among us.

(4) Experience at 1,000 feet has taught us definitely some things heretofore unknown.

(5) We are not at liberty at this moment to tell, of some startling innovations, fundamental in their nature, that I believe, will change papermaking within a short time.

(6) Our experience in developing high speed machines and the accomplishment of 1,000 feet has taught us that the points that papermakers have generally considered in the past as the crucial and essential points in obtaining high speeds are not those that will contribute to further increase in speed.

(7) The driving of a paper machine at any speed is now behind us. The electrical drive will operate at any speed, even if we can't do it with our bevel gear drive, which please do not forget is the only drive yet running at 1,000 feet.

(8) We have learned a lot about wires and the shaking thereof or the lack of shaking.

(9) Reeling of paper has no terrors.

(10) Winding of paper is not a problem.

(11) And in conclusion, so many problems have individually been solved of late that we believe that we can soon arrange a combination of experiences in one machine that will eclipse all other records up to this date.

(12) We are now engaged in putting refinement and precision into our paper machines not required heretofore, which actually up to 700 to 900 feet would have been over refinement and we are preparing for some really high speeds. We hope to attain them promptly, but if we do not we will keep improving and hustling until we do.

Prophecy No. 2.

Regarding Speed vs Width. — I want to state that my position has been for 30 years, and is now stronger than ever, that width and speed can be combined in one machine, and believe that is the machine of the future. Remember, 30 years ago 86'' was the wide machine; 15 years ago the 160'' was the wide machine; and 10 years hence at 234'' or wider may be the most desirable from both viewpoints of Speed and Width.

NEW OFFICERS OF THE C. P. & P. A.

After the items of business in connection with the reports had been disposed of, the meeting proceeded to the election of officers for the coming year. The unanimous choice for president was Percy B. Wilson, Vice-president of the Spanish River Pulp & Paper Mills, Ltd., and for Vice-president, George M. McKee, General manager of the Donnacona Pulp and Paper Co. Ltd. and for the past year chairman of the newsprint section.

News From Europe

By Dr. PAUL BARTHOLOW, New York.

Prices of Wood Pulp in Austria.

If it were not for the "chaos," as Austrians call it, paper, wood pulp, and boards would be very cheap in Austria. But smuggling and illicit trading have raised the price of wood from 700-800 crowns per cubic meter at the forest, to 1,000 and 1,200 crowns. Even at that price (an Austrian crown fetches 6 Swiss centimes) wood might be cheap, but it is difficult to export it. Prices of boards are from 15-16 crowns per kilogram. Export prices are 3-5 crowns higher. Wood cellulose costs 9-10 crowns at the mill; delivered in the stores it costs 50 per cent more. In the meantime the position of the mills is almost desperate. Raw materials cost three or four times as much as they did during the war, for many of these materials must be imported from abroad, where prices are far beyond the ability of many Austrian mills to pay, and much above the fixed prices of the Austrian government.—"Wochenblatt Fur Papierfabrikation," November 27, 1920.

Obstacles to Trade in France.

The business of paper is conducted in France with a minimum of buying, yet even this small amount is regarded with concern, for example — "M. Valois, general secretary, expounded the difficulties in which publishers found themselves in view of the prices of paper which are four times as high as they were in 1914, when the price of current books has only doubled; here is then a great peril for French works. In this grave situation, must we import paper from countries, where exchange is favorable to us, in order to lower automatically the prices of French papers? This is an attractive solution, but it offers a serious danger. If we supply ourselves exclusively in Germany, we will soon put French mills in a position where they will be compelled to close down"—Courrier du Livre, December, 1920. Similarly, it is said: "If we supply ourselves with paper from Germany, we will kill the French mills."—Le Papier, December, 1920.

(The moral of this is not hard to discover. Most men are desirous of making money, and will buy where commodities are cheapest. Commerce is built up on the selling of good material combined with skilful workmanship. In their all-embracing patriotism, French dealers ignore the first essential thing—production).

The Paper Yarn Industry in Germany.

The position of the paper yarn industry has been favorably influenced by the activity which began in the home market during October. One of the reasons given for this activity is the decline in exchange. The demand for twine of all sizes was especially keen, so that production hardly kept pace with it. Besides twine, the buying included other packing materials, while colored yarns for the manufacture of carpets were also sought. Foreign demand has been well above normal; the English, in particular, have been purchasers to an increasing extent of paper yarns and paper yarn products, which the British industry sends in either the finished or raw state to the American market. The English demand extends especially to yarns for carpet manufacture; these yarns are mixed with pure textile fibres and re-manufactured in large quantities as mixed yarn carpets, like the German textilose carpets. There is considerable buying of these carpets of mixed yarns which produce remarkably fine and pleasing grades. Recently the American market has endeavored to grasp this business opportunity, in view of the interest of the consumer in carpets as well as other paper yarn products. — "Papier-Markt." December 10, 1920.

Water Power and its Utilization in France.

It is estimated that the total water power of France amounts to between eight and nine million horse power, of which more than 50 per cent. is confined to the mountainous regions of the South East. France has doubled its water power within five years. In 1913 only 750,000 H.P., were utilized; but recently, despite incalculable difficulties, enormous progress in this direction has been made. The following indications are proof: Installations from 1913-1918, 450,000 H.P.; in 1919, $125,000 H.P.; in prospect for 1920-1921, 275,000 H.P. Total, 850,000 H.P.

Experts figure that a water power of 1,500,000 H.P. installation really corresponds to an actual force of 850,000 H.P.

It is stated that every installation of 1000 H.P. is equivalent to a saving of 5,000 tons of coal a year.—"Le Papier," December 1920.

The Fine Work of the Hollander.

(In this connection see W. B. Campbell's article in the Pulp & Paper Magazine for Jan. 20, 1921).

In Europe, where the hollander is used perhaps more widely than it is here, a great many practical observation on its working have lately appeared. The following is a brief summary of two papers by practical experts: "Although the actual sharpness of the knives of the hollander is a primary condition of the quality of the pulp produced, it does not stand first in order of importance. Before the introduction of the hollander the stuff was beaten and crushed in a stone vat with a stamper. The stock was reduced to the desired fineness not by a process of cutting, but by crushing the fibrous mass, or the indivdual fibres. That the paper produced from this greasy pulp was superior in solidity and strength, is well known, and, today, any one who for special reasons is desirous of approaching this quality, must endeavor to make the work of the hollander approximate as closely as possible to this crushing effect. That this is not accomplished by the newer machines and by sharp cutting edges is certain. In fact the new machines have failed both in the quality, and, strange, to say in the relative quantity of the pulp produced. For example if the screw of a pair of scissors is loosened, a thread placed between them, is only torn; if, on the other hand, the scissors are tightened, a smooth cut is the result. It appears from this, that the rapidity of the cut changes the effect, and that, likewise, the separation of the cutting surfaces tears and bruises the fibres. Fibres usually have the form of a roll and, in extreme cases can be cut. cross-wise or split longitudinally. The first occurs with a sharp hollander knife; by means of this rapid shaving of the fibres, a "pink" pulp is obtained; the longitudinal cut is due to the action of broad, crushing blades, or crushing surfaces for example stone rolls), which act like the stamper that is, by rubbing, friction, etc., producing the "greasy" pulp. The pink pulp has a minimum surface; the greasy a maximum surface; the first, consequently, rapidly loses its water on the machine, the second only with great difficulty. These difficulties, if well understood, become matters of anxious consideration when it is a question of changing the quality of the pulp, that is, from a pulp intended for print papers to a pulp intended for papers of finer quality.—"Papier-Markt," November 20, 1920.

British Trade News

(From Our London Correspondent).

London, Jan. 3, 1921.

Caldwell's Paper Mill Co., Ltd., of Inverkeithing, have purchased the shares of the Inveresk Paper Mills, at Musselborough. The fusion of these two important mills augurs well for the future, as they hold a high reputation as Scottish producers of papers. The purchase price is about £375,000. The Inveresk mill turned over a profit of £130,000 last year, and the fusion means seven paper-making machines running now on fine writings, printing, art and other papers, while Caldwell's mill is notable for grease proof, bank papers, printings, and writings. Mr. William Harrison is a moving figure in these concerns.

Bought Canadian Pulp Mill.

Speaking at the annual meeting of the Amalgamated Press, Ltd., held in London, Sir George Sutton, Bart., the President said: "You will be pleased to know that the Imperial Paper Mills—the second largest paper mill in this country—in which you have a controlling interest, are doing exceedingly well. During the year it was considered advisable to acquire timber limits for the supply of raw material essential to the paper mills and a two-thirds's interest was purchased in the well-known Gulf Pulp and Paper Coy., situated in the Province of Quebec. My colleague, Mr. Linforth, the vice-chairman of the company, went to Canada last summer to carry through this transaction, which we believe to be a valuable and necessary acquisition to the company. In this connection, the Imperial Paper Mills made an issue of £800,000 seven-and-a-half 15-year debenture. The issue was highly successful and owing to the large number of subscriptions received, the lists had to be closed the day after they were opened, practically the whole of the issue being covered in the first day." The Amalgamated Press is a very successful concern: they publish "Answers," "Home Chat," the "London Magazine," the "Picture Show," and numerous other weekly and monthly periodicals.

German Pulp.

Judging by a recent address delivered by Mr. A. P. Burt of the Paper Bag Mnufacturers' Association, to the members of the Paper, Printing and allied trades, he is in favor of encouraging dealings with Germans in paper and pulp. Now, first of all, it must be explained that the German Mark used to be worth 24 cents (1 s.) but now its value is equal to 2 cents (1d.). Mr. Burt has told the trade that what was wanted was increased production and reduced cost. They were, however, getting the opposite. "As Germany must export," he continued, "why not let us take from her such goods as we must import, and especially those which, speaking generally, are imported from neutrals or the U. S. A., of which an excellent example connected with our own trade is wood pulp. Let Germany send us much wood pulp as she possibly can and we will be glad to take it at the lowest price at which she is prepared to sell it. But the Germans are not anxious to sell their wood pulp as shown by the fact that they ask almost as much per ton for wood pulp as for corresponding paper made from it." Here we have an Englishman wanting something for nothing from our late enemy. He is afraid of German competition, because the Teuton prefers dumping the Brititsh market with paper, as it pays better just at the moment.

German Newsprint.

Mr. Burt, however, gave some interesting information on the cost of production in German paper mills. Newsprint, he mentioned, cost 2,500 marks per ton to produce and it was sold in the domestic market for 8,000 marks per ton, which is equal to 7½ cents per lb. delivered in London. From the German point of view this is high. No wonder, therefore, that the placing of German paper on the market in England at a price, which no British mill man could produce it, caused some uneasiness in many circles of the industry. Wages in Germany are not so high as in the British and Canadian mills. Mr. Burt, in the circumstances, does not mind what the German mills do with his raw material—a most important element in manufacture—so long as he does not go into the foreign market to sell the finished article at a lower price than the British or Canadian. It is a case of "Every dog his own bone." German wages to-day are from 250 marks to 350 marks a week for 2-shift men, i.e., about 20 s. to 30 s. a week. Wages in England are four times these rates, and in some cases five or six times, and there is also a 3-shift principle. The fact seems to be overlooked by many that Germany is doing all in her power to get back into foreign markets and she is adopting her old scheme of underselling the domestic supply. To get into foreign markets raw materials must be conserved by her though she can buy cheaper at the rate of exchange, than the British or American, and she can produce cheaper.

British Paper Situation.

Dullness still prevails in the British paper industry. Slackness has set in among the mills of Midlothian and in one, where about 400 hands are employed, most of the workers are on a weekly shift of 3 days, while in another mill short time is being introduced this week. Many other mills throughout the United Kingdom are also giving short time their consideration and in some cases millowners not directly engaged in the manufacture of newsprint have turned their attention to it in order to give employment and keep the mill machinery running. Some of the mill order books do not present a healthy appearance and the depression prevailing is, naturally, reflected in the sales of wood pulp, sellers of which are going through a very trying time.

"I am not downhearted," said a prominent paperman to me the other day. "There is a good time coming and things will reach their own level by degrees. We are suffering from war's re-action and as soon as the money markets of the world are stabilized and the rates of exchange placed on a better footing, we may then begin to look around for more business." He added that it was a question of "lying low," but that he mentioned "takes money to do so."

British pulp prices show no change, neither does newsprint. Wrapping papers are easier. Other classes of papers are firm. "Whitaker's Almanac," a well-known publication in London, is published on a light thin printing paper at a cost of £88 a ton this year, compared with £18 a ton in 1914.

Notelets.

Mills making white printing paper are, in many cases, turning out newsprint to keep things going.

Good supplies of groundwood have reached the United Kingdom during the past month.

The new year opened with several new papers in London. One is the "Daily Summary." It all means more newsprint.

The Bury Paper-making Company, Ltd., in Lancashire, in their report for the year ending Nov. 27, last show a profitable financial year. The gross profit is £40,266 15 s. 4 d., after deducting taxes, etc., and the balance is £32,672 16 s. 6 d. A dividend of 10 per cent on preference shares, less tax, is declared and 15 per-cent, plus bonus of 10 per cent, free of tax, on the ordinary shares, is recommended. The balance carried over is £19,575 15 s. 6 d.

Scottish printers report from Edinburgh: "...Faced by high paper costs and the drain of inflated wages, the smaller masters in the trade are, to all appearances. being threatened with elimination."

Mr. W. H. Sherriff, of the Hodge Sherriff Paper Co., who is on a visit to England, has burst a blood vessel. He is doing well.

Messrs. A. E. Reed & Co., Ltd., have presented a fine club at Tovil for workman and their lady friends.

THE OUTLOOK FOR THE PAPER INDUSTRY.

Following are the opinions of George Chahoon, jr., president of the Laurentide Company on the outlook for the coming year, in the newsprint market; of C. Howard Smith, president of the Howard Smith Paper Mills on the book and high grade paper outlook, and of J. H. A. Acer, head of J. H. A. Acer and Co., on the kraft paper outlook.

The opinions cover the three large fields of business engaged in by the pulp and paper companies of Canada, and together can be consolidated a general summing up of the industry's future insofar as experts each in his line can judge it. The opinions are based on present indications, and do not take into consideration unforseen disaster of any kind that might affect industry as a whole or in part.

Newsprint.

Mr. Chahoon says: The demand for this commodity has been more uniform than for any other commodity and reflects very prosperous conditions in the newspaper industry. Prices for paper made by the large producers are at the maximum. No price adjustment has been heard of and none is possible until after the first quarter of the year. There is nothing in the general outlook that would alter the belief that the newsprint industry is in a very healthy condition due to the fact that the supply and demand are very closely balanced. Whatever may happen in the future no readjustment in newsprint prices will be out of proportion to the readjustment in prices of all commodities that go into the making of newsprint.

High Grade Paper.

Mr. Smith says: There has been a lull in the high grade and book paper market, and some of the mills have closed down, considering it an opportune time to do overhauling. As far as our plants are concerned. they are working at seventy-five per cent capacity with business picking up sufficiently to warrant the belief that within a month it will be again normal. As far as we can see, with readjustment at both ends, the mills making our grades of paper should average out in 1921 on a par with 1920.

Kraft Paper.

Mr. Acer says: These who use packing and wrapping paper, etc., have still supplies on hand and these must be worked off before there can be any return to normal business with the kraft paper mills. The mills have no stocks, and are working to fill incoming orders. When the present supplies in the hands of the consumer are worked off will depend on the increase in business in all lines of commodities, and that part is hard to predict. However, lately we have noticed a slightly better demand although world wide it is still dull.

WHY THE SPOT MARKET COLLAPSED.

The financial page of a Montreal paper has the following interesting comment on the cost of newsprint manufacture and the turn of the spot market:

Speaking generally of the coming year, the head of the Laurentide Company does not think costs of newsprint companies will be much reduced. The two big items, wood and labor, are not likely to fluctuate much. Large companies usually have their wood supplies under way about two years in advance of actual using, so that today's manufacturing is from wood cut nearly a couple of years ago, and wood cut today will be used over a year from now. So long as the market holds, it is not likely that companies will make an effort to reduce wages. In other lines of costs there will possibly be a reduction, but the effect will be more for the future than for the present.

In reference to the so-called spot market, about which there has been much talk, and which appears to have dried up, the explanation is simple. While large consumers of newsprint were being regularly supplied as per their contracts, there was some fear of a shortage or higher prices, so that many of the larger enterprises were buying in odd quantities on the side, and storing it for a possible rainy day. When they were satisfied that the peak of prices was reached, or when sufficient had been accumulated to overcome that fear. this sort of demand ceased. With contract paper coming in regularly, it was not the part of wisdom to store too much spot paper at the prices some anxious buyers were paying.

BITS FROM BELGO.

The new grinder room that will house the new magazine grinders is completed and we are expecting the machinery at an early date. When the new mill will be ready for operation we cannot say yet but unless delays are experienced in deliveries it ought to be about April 1st.

The First Aid room reports for December, 487 dressings and no infection.—No comments!

During the first days of January the Mill and Office were filled with people having smiles on. After due investigation it was found out that the good old French-Canadian custom of wishing a happy New Year was the cause.—Few were blessed with a few wishes, others with plenty! — the boys of course. "Smack". As an example:—

—"Say You!" you haven't wished me a happy New Year yet," said Tommy.

"Well, a happy New Year Tom, but dont kiss me or there will be a fight! "Screams of laughter from the rear! (On Belgo hill going up for lunch Jan, 4th 1924).

The M.A.A.A. Reds defeated the Laurentide A.A.A. basketball team of Grand Mere 22 to 16 Saturday night. The game was played in the M.A.A.A. gym. and was the attraction for a large attendance, who saw a hard and well-fought game. The visitors were the same team which had defeated the Reds at Grand Mere a week before in a keen overtime contest. On the Laurentide team kede:—Swihart, Marguard, Johnson, Blinco and Braydon.

PULP AND PAPER NEWS

The Western Sales Book Company, Limited, has been organized and been granted a Canadian charter, to take over the Winnipeg Sales Book Company and the western sales book businesses of the F. N. Burt Company of Toronto and the Appleford Counter Check Book Co. of Hamilton, Ont. The new concern is putting in a modern sales book plant sufficient to provide for the growing demands of the west and expects to begin operations about Feb. 1. Mr. Theo. K. Pickering, formerly of the Appleford Company, is president and general manager of the Western Company which is capitalized at $350,000, of which $100,000 is preferred and $250,000 is common stock. The company is authorized to carry on business as printers, lithographers, manufacturers of books, counter check books, etc.

Mr. N. L. Martin, secretary of the Canadian Paper Trade Association, Toronto, has been elected a director of the Royal Toronto Athletic Club, an organization which is projecting a big club building on Bay Street.

Practically all the public bodies and institutions in Toronto were represented at the funeral of the late Sir William Gage, founder and head of W. J. Gage & Co. Service was held at the family residence on Davenport Road after which the remains were interred at Mount Pleasant Cemetery. The Governor-General, from whom a telegram of sympathy was received, was represented at the funeral by Col. Bishop. The Lieutenant-Governor of Ontario was present in person and many other men prominent in civic and business circles in the city gathered to pay their last tribute of respect to one who was universally esteemed.

Hon. N. W. Rowell, K.C., has been retained as counsel for the Ontario Government in the suit against the Shevlin-Clark Lumber Company, for money alleged to be due the Government for unpaid dues on timber limits investigation being conducted by the Riddel-Latchford Commission.

Mr. John M. Imrie, formerly manager of the Canadian Daily Newspaper Association, who started a morning paper in Hamilton, Ont., has joined the organization of William Southam & Sons, Limited. His work will be of an advisory and executive nature in connection with the various companies and in the meantime he will be associated with the Hamilton Spectator.

Lieut.-Col. T. Gibson ,Vice-President of the Spanish River Pulp and Paper Mills, Limited, was elected president of the Aero Club at its annual meeting in Toronto.

Hon. George P. Graham, president, and the staff of the Brockville Recorder, were tendered a complimentary banquet by the Brockville Board of Trade on January 18th in honor of the newspaper's centenary. On behalf of the citizens of the town Hon. Mr. Graham was presented with a silver loving cup. Col. George H. Ham, of the press department of the C. P. R. and Mr. P. D. Ross, of Ottawa, President of the Canadian Daily Newspaper Association, were the chief speakers.

Lieut.-Col. T. Gibson left Toronto on Thursday night last for New York to attend a directors meeting of the Lake Superior Corporation, of which he is general counsel. He will also attend a meeting of the directors of the Spanish River Pulp and Paper Mills, Ltd., at Montreal.

Representatives of certain publishing houses in Toronto asked the Ontario Government a few days ago for relief from losses incurred in the publication of school text books. It is understood that the Government was sympathetic, but took the view that there was a serious principle involved in interfering with existing contracts.

Mr. A. G. Pounsford, general manager of the Provincial Paper Mills, Limited, Port Arthur, was in Toronto last week. Before returning north, Mr. Pounsford will visit Neenah, the centre of the pulp and paper industry in Wisconsin.

Barrister Charles McCrea, ex-M.P.P. and G. B. Gray, of pulp and paper fame, are Sudbury visitors in Toronto.

To carry on business as proprietors and publishers of magazines, newspapers and to engage in a general printing, publishing and lithographing business, Press Service Corporation, Limited, has been granted a Dominion charter, with the chief place of business Toronto. The capital stock is $250,000. Montreal barristers are the incorporators.

Mr. T. H. Weaver, of the Toronto Type Foundry, Limited, Toronto, is stated to be in the market for a small newsprint mill for one of his clients.

Among those from Toronto who attended the annual convention of the Canadian Pulp and Paper Association in Montreal were Mr. I. H. Weldon, Mr. Duncan and Mr. Piper of the Provincial Paper Mills, Limited, Mr. George Carruthers of the Interlake Tissue Mills, Limited, and Mr. C. Nelson Gain and Mr. Harry Muir of the Don Valley Paper Mills.

Mr. S. A. Gibson, who has been identified with the Ingersoll post office for 31 years has received the appointment of postmaster in succession to his late father. He is a brother of Lieut.-Col. Gibson and Mr. J. G. Gibson, Vice-President and secretary, respectively of the Spanish River Pulp and Paper Mills, Limited.

Mr. A. T. Willgress, who has been Provincial King's Printer for several years, has been appointed Librarian, at the Ontario Parliament Buildings, to succeed Mr. Pardoe who is being superannuated and Major C. W. James, secretary to the Minister of Education, is slated to become Purchasing Agent and King's Printer combined.

President J. T. Carey, of the United Brotherhood, in a statement, made it clear that the two organizations intended to share in some way in what he termed the "fairly decent profits" of the paper manufacturers of the continent. Their wage demand would be based on the assumption that manufacturers can afford to pay an increase upon wages fixed in May 1920, without passing the increase on to the consumer. He pointed out that the increase in the price of paper in two years had been 200 per cent. while the wage earner had not benefited to anything like that extent.

UNITED STATES NOTES

W. P. Taylor, son of S. P. Taylor, California's first paper manufacturer, is planning to erect two mills at San Francisco for the manufacture of pulp for cardboard from rice hulls. Mr. Taylor has devised a means of converting this waste material into a solid "chip" board for use in box making. California concerns have been paying $12 a ton daily to have rice hulls, considered useless, burned, says Mr. Taylor, who claims that he demonstrated the practicability of using them for paper in a recent experiment at a large paper mill in Stockton. Mr. Taylor asserts he has shown that pulp for box board can easily be made from the rice hulls at an expense far below the cost of burning them.

Persons employed in the paper and printing trades in Greater New York, Jan. 1, 1921, numbered but 9,596 as against 16,029 on January 1st, 1920. These figures are included in an industrial survey of New York State just completed by Dr. David F. Flynn, representative of the State and Federal labor departments. Outside of Greater New York the group listed in the report under the head of lumber paper and paper products, showed a total of 134,000 persons at work, January 1, 1921, as compared with 158,000 for the corresponding day of 1920. 645,043, or 34.91 per cent of the wage earners of the State are shown by the survey to have been out of employment at the beginning of the present year.

Winthrop M. Crane, son of the late Winthrop Murray Crane, one time United States Senator, was elected a director of the Berkshire Life Insurance Co., last Thursday to succeed his father. Mr. Crane became head of the Crane family's paper manufacturing interest at Dalton several months ago following the death of the ex-Senator.

The stockholders of the North American Pulp and Paper Company will meet on February 8 to vote on a proposal to authorize its trustees to terminate their trust and sell its assets for an amount equivalent to at least $6 cash in American funds for a share of the company's common stock after redemption of its preferred issue. Holders of ten shares of its common stock will have the right to exchange them for a share of preferred stock and four shares of common stock, of $10 par value of the Saguenay Pulp and Power Company.

Writing last week to the American Forestry Association in response to a request asking that he name the tree best representing America, President Wilson declared that he found himself unable to make a choice because American forests are so rich with infinite variety.

The New York State Publishers' Association, whose membership includes the owners of fifty-two daily newspapers, adopted resolutions at Albany last week placing themselves on record as opposed to any reduction of hours in the mechanical departments of their papers. This action resulted from an announcement by officials of the Stereotypers and Electrotypers' Union that, beginning May 1, the union would demand a 44-hour week, a reduction of four hours from the present working week. This demand of the union has also roused to action employers of job and commercial printers throughout the middle West.

The St. Louis branch of the Printers' League of America has just issued a call for a meeting to be held at St. Louis, February 3, for the purpose of organizing a fight on the 44-hour week movement.

Albert F. Hagar, president and general manager of the Hagar Strawboard & Paper Company of Xenia, Ohio, died suddenly last week, the victim of a heart stroke, at his offices, No. 60 Wall street, New York city.

A fight on the Federal Water Power Act is being instituted by the State of New York, whose Attorney-General, Charles D. Newton, has filed objections to the applications made by twelve Western New York associations and corporations for leave to divert and utilize through the construction of dams, the waters of the St. Lawrence and Niagara Rivers for power purposes. The objections will be argued before the Federal Commission at a hearing in Washington, January 24. The Attorney General takes the position that the province of the Federal Government relative to these waters was limited to taking such steps with respect to the use of the water power purposes and with respect to dams and structures to be erected as will insure that they do not operate to impair the navigability of the waters.

Col. Robert M. Thompson, of New York City, was reelected president of the New York State Forestry Association at a meeting held in Albany, last Friday. J. R. Simmons, of Syracuse, was elected secretary-treasurer. Included among the twenty vice-presidents were Elihu Root, Franklin D. Roosevelt, former Ass't. Secretary of the Navy, and New York State Conservation Commissioner George D. Pratt.

The capital stock of the Eastern Pulp Company, Limited, has been increased by Letters Patent from $500,000 to $750,000.

Fire, which broke out on the premises of the Winchester Press, at Winchester, Ont., wrought damages to the extent of $25,000 to the plant and adjoining premises.

The mill of the Kaministiquia Pulp and Paper Co. at Port Arthur has been completed. Production of ground wood pulp will commence on January 24th.

Sections of the annual convention of the Associated Sulphite and Paper Mill Workers and the International Brotherhood of Papermakers, the first to take place in Canada, were held in Toronto during the week and at the present writing the organizations are engaged in endeavoring to secure a uniform and satisfactory wage schedule in all American centres of paper production. At the paper makers convention, Mr. Tom Moore, President of the Dominion Trades and Labor Congress, declared that organized Labor would move to safeguard existing wage standards. Labor unions, with the backing of the Dominion Trades and Labor Congress, would attempt by peaceful means to get justice. He emphasized the importance of labor unions doing their part in assisting the country during the period of reconstruction.



WHERE "CAPITAL WIRES" ARE MADE.

The photograph on this page is a view of the wire weaving shop of the CAPITAL WIRE CLOTH and MANUFACTURING COMPANY, LIMITED, Ottawa, Canada. They manufacture brass and phosphor bronze wire cloth for the Canadian Pulp and Paper trade exclusively.

This concern was established in 1912 and turned out the first finished product in December of that year, when they had two looms in operation. At the present time there are sixteen looms operating, with four more under construction.

Mr. J. R. Buchanan, President and Manager of the company, has been connected with the industry for over twenty-five years and comes from an old wire weaving family, his grandfather having woven the first Fourdrinier wire made in America, this being in Belleville, New Jersey, in 1848.

It is interesting to note the changes which have taken place in the industry from that date to the present time.

In 1850 the dimensions of the average Fourdrinier wire were 40 to 50 inches wide and twenty-five feet long, and the average speed of paper machines at that time was from twenty-five to fifty feet per minute.

Up to 1895 the demands upon the wire manufacturer were not great as it had not been difficult to keep pace with the normal changes in the paper manufacturing industry, but during this year the Speed Bug caught the industry and the Glens Falls Paper Mills Co., of Fort Edward, N.Y., opened up a new era in the trade by building a paper machine 110 inches wide using a sixty foot wire to run at a speed of four hundred and fifty feet per minute. It was claimed that this machine was twenty years ahead of the times and that conditions were not right to make such radical changes as this speed was unheard of and not believed possible. However, it was a success and ran at the specified speed making a very satisfactory sheet of paper.

From this time on changes in machine and clothing were rapid, and in 1897 a machine was built to take a wire 120 inches wide. The wire manufacturer was now filled with dismay as it meant radical changes in loom construction to weave a wire of this width, and some manufacturers went so far as to say that it could not be done. Today wires are being woven well over two hundred inches wide and the end is not yet.

To meet the ever increasing requirements of the modern paper making greyhounds it behooves the wire manufacturer to keep in close touch with the rapidly changing conditions and to adapt his equipment and process of manufacture promptly to meet these requirements.

The Capital Wire Cloth and Manuracturing Company Limited endeavors to acquaint themselves with the individual requirements of their trade and to build wires to meet the particular needs of their customers. That their policy is a success is evidenced by the modern up-to-date successful plant which they operate, and by the satisfactory performance of their wires under a great variety of operating conditions.

LA TUQUE WON FROM LAURENTIDE.

Grand'Mere, January 21.—La Tuque won the second game in the St. Maurice Valley Hockey League at the Shawinigan Falls rink Jan. 20, when they defeated Grand'Mere in a thrilling overtime contest by the score of 2 to 1.

The Teams were:

Grand'Mere (1).		La Tuque (2).
Maltais	goal	Duchene
Richardson	defence	Lacroix
Hayes	defence	Mongrain
McLaughlin	forward	Hughes
Roberts	forward	Kane
Hoffman	centre	McNaughton
Boyd	subs.	McNaughton
Richard	subs.	C. Goswell
Neville	subs.	F. Goswell
MacKinnon	subs.	Gillard
Lamirande	subs.	Breathwaite
Barrette	subs.	

The hockey team of the Brompton Pulp and Paper Co. is one of the four teams in the St. Francis Valley Hockey League. Twelve games are scheduled.

A successful series of hockey games is being played in Montreal. Most of the Montreal offices of pulp and paper companies have teams in the league.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, Jan. 22.—General conditions in the pulp and paper industry are unchanged. Prices for several lines of paper still exhibit a downward tendency and the market is in a very unsettled state. While there has been some improvement during the week in the volume of buying and the size of the orders, it appears to have been due to the sorting up process which has been prevailing in the job houses and print shops of late. In some cases, however, it is known that stocks are getting low and it is generally believed that buying will set in briskly within the next few weeks, although the feeling is general throughout the buying trade that quotations have not yet reached rock bottom. This is militating against big business in the pulp and paper industry. During the past few days several lines underwent a reduction, notably flat newsprint other than contract, and manila paper. Book paper manufacturers and jobbers have not yet got their prices down to a permanent basis and in the meantime deliveries are being made at the price prevailing at date of shipment. Book papers, ledgers and bonds are all being sold at a reduced prices but quotations are not stable and are liable to change from day to day. In the meantime it has not been possible to prepare anything like a representative price list of these lines of paper although it is likely that another week will see a general agreement as to what prices will prevail for the next couple of months for book, bonds and ledgers. While conditions generally are unsettled at the present time it is rare that one hears a note of pessimism concerning the future of the trade. This was borne out during the week by the reports presented at the annual meeting in Montreal of the Canadian Pulp and Paper Association at which comprehensive surveys of the trade generally were presented and which depicted the industry as being in a healthy condition and with a bright future in prospect.

PLUP.—Dullness still characterizes the pulp market, although the general manufacturing conditions have been considerably improved of late. Water conditions are better and for the most part the mills are again grinding normally. Very few sales of ground wood are being made and the prevailing price is $80 to $90, although it is said that a few sales have been made at lower prices, than those mentioned. With many of the board and other mills closed down in the States sulphite is piling up and comparatively little is moving. There is also a tendency on the part of the paper mills to hold off buying in anticipation of still lower prices. Bleached sulphite is quoted at $140 and unbleached at $100.

TISSUES AND TOILETS.—The mills report a distinct improvement in business with increased orders of a larger size, from which it is gathered that stocks are getting down to a point where the dealers find it necessary to replenish. Raw stock for light weight papers is being freely offered, but manufacturers say that there has not been a sufficient easing off in the price of pulp to tempt them to buy. There have been no further reductions in prices and it is not anticipated that there will be for some little time. A meeting of light weight paper manufacturers is to be held in Montreal next week.

BOOKPAPERS.—While the prices of book papers have been reduced they are not yet down to a stable basis and shipments are being made at the price prevailing at date of shipment. Present prices are only tentative and until the mills find themselves in a position to figure on a non-changing pulp market and get at their cost of manufacture it is expected that there will be more or less of fluctuation before anything like a stable price list for book papers is prepared.

MANILAS.—The feature in the manila market this week was a drop of half a cent a pound on both "B" and "No. 1." The old prices on which the present reductions apply were: "B" manila, $9.50, $10.50 and $11.50. No. 1 manila, $11.50, $12.50 and $13.50, the figures are being for car lots, ton lots and less than ton lots respectively. The new prices came into effect on January 20th.

SHEET NEWS DOWN.—The old average price of ten cents a pound for sheet news was replaced last week by a slightly reduced price schedule. On one ton, and upwards the price now is 8½c. per pound: ¼ ton and up to one ton 9c.; less than ¼ ton 9¼c. all prices f.o.b. thirty days nearest shipping point.

NEW YORK MARKETS.

New York, January 22—(Special Correspondence)—There is no surface indication of any revival of activity in the paper market of worthwhile character. Demand from most consuming quarters continues limited; buyers are operating only against immediate requirements, and, aside from contract business, there is little stirring in the trade. Notwithstanding the tone of the market seems to be daily gaining strength. Perhaps this is largely due to the confident feeling possessed by manufacturers and merchants that the paper situation will not long remain in its prevailing condition, but there are other causes for the firming tendency of the market. Inquiry from consuming sources is of a nature inferring that users of paper of most kinds either are in want of paper or expect to be in the near future, and that just as soon as matters in their own industries become more settled they will resume buying of paper in something closer to normal volume. It is plainly apparent that business in many lines is steadily picking up after the period of depression, and it stands to reason that the paper trade will benefit by the increased activity in consuming industries in due time. The shoe manufacturing industry, for example, is rapidly getting back to normal production with plants in various parts of the country resuming operations, and it follows that demand for boxboard for the manufacture of shoe boxes should soon arise. Trade in almost every kind of wearing apparel is on the mend, and this should be reflected presently in the paper industry, because large amounts of paper and paper boards are consumed in the marketing of such merchandise.

The changes recorded in paper prices this week have in the main been in a downward direction. This



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is rather to be expected when one stops to review the circumstances. No broad alterations in quotations have been reported, yet lower prices have been noted on certain grades of paper. Some mills have reduced prices on fine papers. The lower qualities of bond papers are now available down to 17 to 18 cents a pound, whereas not so long ago about the cheapest price quoted on any grade was 25 cents. Most of the fine paper mills are unquestionably in need of orders. A majority are managing to get enough business to keep them running on short time schedule, but there is no concerted buying movement and the great bulk of orders coming in involve light amounts of paper.

Wrappings are quoted lower. A leading producer of kraft wrapping is reported to have reduced quotations on No. 1 stock to less than 10 cents per pound, and other manufacturers have necessarily fallen in line and reduced prices in proportion. Jute wrappings are reported at around 11 to 12 cents for No. 1 quality, while butchers' wrapping is available at 7 cents and less. Tissues are holding steady at the reduced levels reported several weeks ago, but are sought merely in routine fashion.

There is no change in the newsprint situation. Contract business constitutes the bulk of activity in the market, and there is a firm tone to contract quotations, whereas prices on spot shipments are rather easy. It is understood on high authority that several of the leading manufacturers of news have contracted for practically their entire output for 1921 at the prices announced just prior to New Year's, and those concerns which are making commitments only for limited periods are said to have contracted for all the tonnage they are willing to dispose of at present. Prices on spot newsprint rule at around 7 to 7.50 cents a pound at domestic mills, and it is reported that some lots of foreign print paper are being sold at under 7 cents.

The board market is characterized by a little more activity. The feature this week has been the expansion of demand for chip board, it being stated that mills in a number of cases have booked orders calling for sizable amounts of chip board. Quotations continue at $50, or a bit lower, per ton at mills for plain chip and around $55 for filled news board.

GROUND WOOD.—Slightly lower prices are reported prevailing on mechanical pulp. Sales have been recorded down to $80 for domestic ground wood of prime quality, and while producers are said to be asking higher prices for large tonnage, it is nevertheless a rather easy matter for buyers to acquire small quantities at this figure, and possibly for less. The market tone is not as strong as it was a short while back, still it cannot be said that there is any unusual show of weakness. Sellers of pulp are not pressing their wares on the market, realizing that consumers are not in a buying frame of mind at the moment and that moment and that the best policy for them to pursue is that of holding aloof pending a revival of buying interest. Imported ground wood of No. 1 quality continues to be held at around $80 a ton ex the dock, and is reported finding some takers at this basis.

CHEMICAL PULP.—Recessions in prices on most grades of chemical wood pulp have occurred this week, due more to the continued absence of buyers from the market than to any other single cause. There have been sales of foreign unbleached sulphite of No. 1 quality down to around 6.25 cents ex dock, while foreign bleached sulphite is available at 9 cents and foreign kraft pulp at 5.25 cents. Domestic sulphite of newsprint grade is reported selling at $100 a ton at pulp mills and less, and domestic bleached sulphite is offered at 8 cents and domestic No. 1 kraft at less than 5 cents. In reality there is scarcely an established price basis on any grade of wood pulp. Current transactions involve such small quantities, as a rule, that not enough supply is moving in the open market to fix definite values. There are some "weak" sellers operating, as would be expected under present conditions, yet most dealers and importers are waiting out the market in the belief that better times are in store and that when papermakers increase their buying the prices desired will be readily obtainable.

Importations of pulp at this port this week included 1,600 bales from Trondhjem.

RAGS.—A little broader demand for roofing rags appears to be the chief feature of the papermaking rag market. Demand for all grades continues narrow, there being no concerted buying movement affecting any description of stock, and buyers in a majority of instances are managing to fill their present wants through purchases at close to the lower edge of quoted values. Roofing is probably the one exception to these conditions. Several leading felt paper mills have been actively in the market this week and have absorbed enough supply to be creative of a firmer price tone in this class of rags, and about the lowest at which dealers will accept orders now is $1 per hundred pounds at shipping points for No. 1 roofing rags and 90 cents for No. 2 packing. Old whites are held in many quarters with a little more tightness, with repacked No. 1 whites quoted at 9.50 to 10 cents a pound and miscellaneous packing at around 7.50 cents. Thirds and blues are mainly neglected and are quotable at 3 cents for repacked and at about 2 cents for rough packing. New cuttings are in limited demand but are generally held at steady prices by dealers.

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Magenta Powder.
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Methylene Violet 2R. conc.
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PAPER STOCK.—Low qualities of old papers have strengthened in price to a considerable extent this week, due to buying by board mills in the near vicinity of New York. It is quite evident that only certain consumers are buying, yet those that have been in the market have stirred up matters sufficiently to send quotations up $2 to $3 a ton. No. 1 mixed papers are fetching 50 cents per hundred pounds f.o.b. New York and packers, seemingly without an exception, are firmly insistent on at least this price. Flat folded newspapers are bringing 65 cents a hundred, No. 1 container manilas 60 to 65 cents, and No. 1 overissue newspapers about $1 per hundred pounds. Old books and magazines are in better call also and are freely selling at 1.60 cents a pound at shipping points, while business has been reported done in No. 1 soft white shavings at 3.75 cents a pound New York and in hard white shavings of No. 1 grade at 4.75 cents New York.

OLD ROPE AND BAGGING.—There is no change in old rope or scrap bagging and very little life in any corner of the trade. Consuming mills are doing practically no buying of consequence, and it is problematical at how low prices supplies can be secured. No. 1 domestic manila rope is quoted to consumers at 4.50 cents per pound and No. 1 scrap bagging at 2 cents.

There can be no successful development of business that does not carry the employees along with it. Consciously or unconsciously, we must all aim at the common good of all engaged in any productive enterprise.—Lord Leverhulme.

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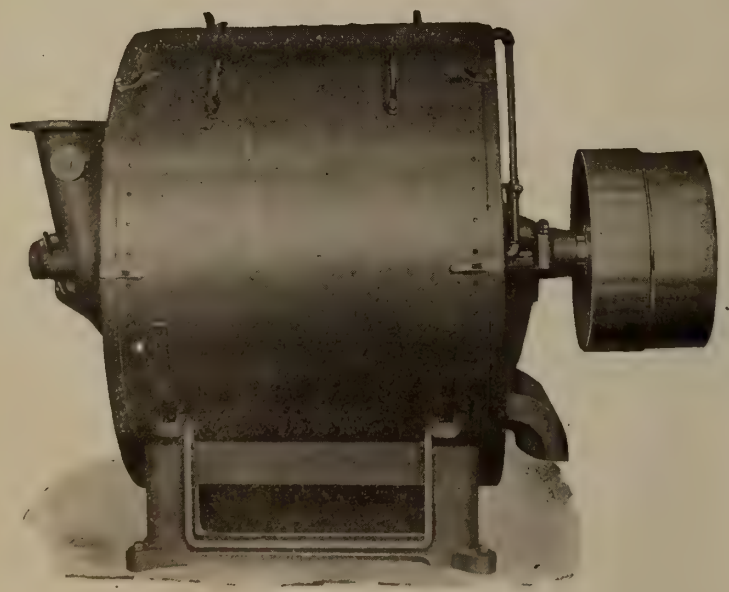
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VOL. XVIX. GARDENVALE, P. Que., February 3rd 1921. No. 5

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Room 205 Drummond Building, Montreal, 'Phone Uptown 7773.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

Subscription to any address in Canada, United States and British Empire, $5.00 yearly. Other Countries Postage Extra. Single copies, 15 cents.

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EDITORIAL

750 *TONS AND A PROBLEM.*

Twelve mills in Canada are making about seven hundred and fifty tons of sulphate or kraft pulp daily —over two hundred thousand tons a year. The production of each ton involves the discharge of a by-product which has caused considerable friction in some communities where such mills operate. Some by-products of sulphate mills have proved to be of value and have been made a source of income. Turpentine and pine oil might be cited as examples. The odor, characteristic of the neighborhood of a kraft mill may never be a popular perfume but it would be a great scientific as well as economic achievement to devise a means for removing the sting (g=k).

There is no country to which the manufacture of sulphate pulp is more important than to Canada. It would be a national asset to have a method of overcoming this disadvantage. A suit, now in the courts, for an injunction against the use of the process by a certain mill because of the odors are disagreeable to a gentleman owing a summer home in the vicinity, has brought the matter to the attention of the public. Apparently this gentleman so far seems to have the only olfactory nerves sufficiently supersensitive to inspire a law suit, but the incident, unpleasant as it is, serves to emphasize the importance of discovering a remedy for the trouble.

From work that has been done in Europe it appears that the troublesome smelling elements are present only in minute quantities and this is one of the difficult phases of the problem. It is a case where a little goes a long way. The task of capturing a few ounces of smell in a million cubic feet of atmosphere is not an easy one. To do it at all, not to speak of doing it economically, is really too much of a problem for one small mill to solve.

A Director of Research, who could coordinate the efforts of all the technical men in this branch of industry, would seem to be the most effective means of attack. The solution of this problem, which is but one of many facing the pulp and paper industry in Canada, is of such moment to all kraft mills, at least, that they should be glad to give the fullest co-operation and assistance to the work of the Department of Research which the Association has decided to establish. When it comes to work of a fundamental nature, such as investigating the chemical and physical properties of some particular substance we shall all be glad to have the help of the National Research Institute.

NOT WHO BUT HOW LONG

When the Editor came to Canada in 1916 the notion was fairly widespread in the United States that Canadian mills turned out some mechanical and chemical pulp and a sheet of newsprint that one would hardly boast of. The industry in the Dominion was a convenient supplementary source of supply, but not a really serious competitor. How opinions change! Canada is now looked upon as the back bone of the paper industry of this continent. Those who carefully studied the matter recognized this situation years ago, as evidenced by the mills on the Ottawa, the St. Maurice, the Saguenay, the Pacific Coast, etc. By far the greater amount of paper and all the pulp is made from wood and the preponderance is steadily increasing. Wood fibre is pre-eminently the basis of the Canadian industry, though our fine mills make as excellent a sheet of rag paper as the most fastidious could desire.

Some years ago the provincial governments of Ontario, Quebec and New Brunswick, recognizing their obligation to provide raw material for Canadian workmen, included in the terms for leasing Crown lands, the regulation that wood cut therefrom should be carried through at least one conversion process in Canada. Some American mills have become perilously short of pulp wood supplies and a vigorous attempt was made last year to have this restriction, especially in Quebec, removed. The government of Sir Lomer Gouin stood firm for the restrictions and the government of Hon. Mr. Taschereau takes the same stand. We may therefore consider the answer to the question, "Who shall use Crown land wood?" to be "Canadians."

Another question then arises which is fully as important as the first, namely, "How long shall Canadians cut and use this wood?"

Obviously this cannot be answered until three other questions are answered:

1. How much wood have we and how fast does it grow?

2. At what rate is it being consumed by converters and destroyers?

3. In what manner is it harvested and how can these methods be improved?

Since our advent as editor of the Pulp and Paper Magazine, we have become convinced that the problem of forest conservation is certainly the biggest economic question facing the industry and the eastern provinces, if not also the Dominion. Every oppor-

tunity has been taken to study the situation and we have planned a series of editorial articles dealing with the various phases of the problem. Much helpful assistance has been given by foresters and operators. The matter deserves earnest thought and discussion and the columns of the Magazine are open to any who have comments to make.

The question of "Who?" has been answered for good; the question now before us is "How?"

FAITHFULNESS

A friend of ours died last week. He was fifty years old and sme lamented his going because he was in the prime of life and might have continued to be of service. Some thought his work has not finished. Measured in the making of reports, compiling tables and balancing accounts the possibility of service would be merely a matter of more months. But our minister pointed out the great truth that a life should not be measured so much by what one does as by what one is.

Our friend was paid for what he did. What he was is beyond computation by the slide rule and adding machine nor could his sterling Christian character be represented by gold or silver. He was faithful, true, loving, kind, generous. Length of years is no measure of these qualities. Christ lived only thirty-three years, yet who would say His life work was not finished. Our friend was His faithful servant and so he was respected and loved by those whose privilege it was to know him.

There is a lesson here for all of us. No matter how important our work may be, or how many tasks remain for us to do, it is what we **are** each day that counts. If our true selves are upright, clean, and faithful, we shall do our work and there will be no cause for regret, when we go, for what we have not done, but only of appreciation for what we have been.

COBWEBS

No one will question the appropriateness of using the water mark to aid in enforcing prohibition in the United States. The water-mark "Internal Revenue-Prohibition" is to assure the genuineness of prescriptions for liquor. Canada might take a lesson.

One tree cut on the Chaudière River by the Brown Corporation made over three cords of pulp wood.

One hundred and twenty-five years old! George Bird did not live so long, but the spirit of life and good will, which he gave in 1795 to the concern now known the world over as Bird and Son, still lives. How proud George Bird would be of the little business he started in Needham, Mass., 125 years ago, now vastly greater in every respect because his successors have been true to his own ideals of honesty and responsibility. Bird and Son came to Canada in 1905 and built a mill in Hamilton, Ont. for making roofing papers. In 1908 the felt paper mill at Pont Rouge, Que., was bought, so Canadians are much interested in the growth and success of Bird and Son, which is so well set forth in a commemorative booklet.

A number of pulp mills have been shut down for at least a part of the past month. Inactivity has naturally hit the kraft mills hardest, as the general dullness in business is first reflected in the use of wrapping papers. From all reports, there are already signs of improvement. A mild winter this year has truly been a God-send to those whose work is slack.

The Chatham (N. B.) Weekly World adds its protest to the export of raw pulpwood, though several rossing outfits one exporting wood by the carload at good prices.

The Industrial and Educational Publishing Co. has launched a new monthly paper "Scientific Agriculture". It is the organ of the Canadian Society of Technical Agriculturists. Mr. F. H. Grindley is Editor and Secretary. We say it is a good paper. If you doubt it, send for a copy.

The next issue of the Pulp and Paper Magazine will contain the address of Mr. H. S. Taylor on "The Ventilation of Paper Machine Rooms" and the addresses of President Wilson, Sir Henry Drayton and Hon. Walter Mitchell.

"KEEP ON GOING, THERE ARE TWENTY MORE BEHIND YOU."

One of our recent salesman's bulletins reminded the writer of one of his own experiences in his early days of selling, says a mill paper.

"My chief sent me to West Virginia, and after I had called on a few buyers, I found that each one was offering the same excuse for not purchasing; namely, that four or five of my competitors had been there ahead of me. I, having no previous experience, thought the best thing to do was to wire headquarters, advising them of conditions, so I sent a telegram saying that there was no use of my travelling West Virginia, as four or five of our competitors had just covered the field. The answer that I received read: "Keep on going, there are twenty more behind you."

That experience made such a definite impression on my mind that I have never forgotten it, and it frequently creeps out, even to this day, when calling on dealers and they mention that this man or that man was in town yesterday." George E. Messer, in the Neponset Review.

Several hundred supporters of the Pulp and Paper League were on hand at the Scheduled games last week in Montreal and witnessed some hard-fought contests. C. F. Dawson defeated Abitibi, 4 to 2; Riordon Co., and Canadian Export Paper played a 3 to 3 draw, while the game between Howard Smith and Macfarlane Sons ended in a one goal draw.

An Industrial Research Department

At the annual meeting of the Technical Section of the Canadian Pulp and Paper Association on January 19, 1921, a very important proposition was outlined and discussed. When the reports of regular committees, as printed in the Pulp and Paper Magazine for January 20, had been disposed of, Col. C. H. L. Jones was asked to present the report of the special committee on the matter of Industrial Research.

Col. Jones addressed the Section as follows:

This is the report of the joint committee appointed by the Canadian Pulp and Paper Association, and of the Technical Section of the Canadian Pulp and Paper Association to investigate the position with respect to the institution of a Department of Technical Research within the activity of the Canadian Pulp and Paper Association.

COMMITTEE ON RESEARCH.

By C. H. L. JONES, Chairman.

Report of Joint Committee appointed by the Canadian Pulp & Paper Association and the Technical Section of the Canadian Pulp & Paper Association, to investigate possibilities respecting the institution of a Department of Technical Research within the activities of the Canadian Pulp & Paper Association.

1.—History of Movement Prior to Appointment of Above Committee.

It has been realized pretty generally within the Association, and particularly by the Technical Section for over the past two years that the pulp and paper section of the Forest Products Laboratory was not functioning in a manner so as to produce the maximum benefit to the industry and the public at large. One of the chief weaknesses has been lack of staff.

Realizing this the Technical Section had appointed a standing committee called the "Committee on Forest Products Laboratory." This Committee had studied the situation thoroughly and in various reports had pointed out the situation, namely a finely appointed laboratory for pulp and paper research with thousands of dollars worth of equipment but lacking any proper program of work, staff or proper guidance.

In 1919 the Canadian Pulp and Paper Association authorized a substantial contribution towards the superintendence of the laboratory but such contribution was not found acceptable to the Government.

Various schemes have been proposed by individuals, all of which have been discussed by the executive council of the Technical Section from time to time, ranging from co-operation with the Government in the running of the laboratory to the buying of the equipment and starting of a laboratory in various new locations.

No co-ordinated effort looking to the final solution had occurred up to the time of the 1920 annual meeting of the Association and so at the first meeting of the executive council of the Main Association held in 1920, the President of the Association, Mr. George Chahoon, Jr., instructed the Technical Section to make a thorough investigation of the subject and to report with recommendations at the annual meeting of the Association in 1921.

During the Spring months of 1920 the Technical Section Chairman gathered the opinions of a large number of members who were conversant with the situation as well as the general opinion of many more relative to the advisability in a general way of the Association attempting to go into such a field. Furthermore, this subject was thoroughly advertised to all members as being one of the chief points for discussion for the 1920 Summer meeting of the Technical Section.

The result of this discussion was that it was thought wisest to have the investigating committee consist of representatives of manufacturers or management as well as of the Technical staffs. Consequently the Joint Committee of six, three Technical men and three from managerial end, was appointed.

2.—Work of Committee.

A.—Review of Forest Products Laboratory.—The Committee had prepared through the Secretary of your Association a complete review of the accomplishments to date of the pulp and paper section of the Forest Products Laboratory showing their original program, how much was carried out, etc., etc., and the present state of this section of the laboratory.

B.—Meeting of Committee.—The committee met on November 20, 1920, in Montreal, all members being present, and the matter was thoroughly gone into in all its phases.

The decision of the committee is as has been outlined in the recent circular letter of the Secretary of the Association. Briefly it is as follows:

Your committee recommends that the Association engage in the establishment and maintenance of a department devoted to Technical Research on pulp and paper work.

The committee feels that at the beginning no attempt should be made to take over nor work through the Forest Product Laboratory and no attempt to build a laboratory of our own until further developments have taken place.

The committee recommends that the Association cooperate to the fullest degree with the Canadian Council of Industrial Research in the furthering of the project of the proposed National Research Institute:

That to fully carry out this work the Association should have the services of a Director of Research with competent staff, who will be in full charge of all this work until such time as actual research work is begun and who will then be the director of this branch of the Association work. The details of the preliminary work of such a director and staff have already been set forth in the recent report by the Secretary of the Association sent to all members of the Association.

The committee recommends that the necessary expenses, which are estimated at around $35,000 for the first year, be furnished by the members of the Main Association on a pro rata basis.

3.—The Need for Such a Department.

I do not believe it is the duty of this committee to go thoroughly in this report into the details of the desirability of such a department. I will refer you to the annual report of the Retiring Chairman, of the Technical Section, Mr. L. H. Shipman, who has set forth there the details of one problem alone which should be sufficiently illustrative of the general need of such a department of our Association.

Problems similar to the one there outlined exist without number throughout all branches of our industry.

Particularly are we working in the dark in our beating operations. What we think are identical conditions of material and operation give us entirely different results on different days. Only efficient, well directed and non-interrupted research will furnish us the why and wherefor and allow us more uniform results.

4.—Finally a Word of Warning.

While your committee is unanimous in their recommendation, it is made with the full understanding that the successful carrying through of such a program entails other support by the industry than that of money. This alone will not suffice. To quote a gentleman who has had considerable experience in co-operative research.

"It is one thing to talk co-operation and a laboratory program to be carried out for the benefit of all and quite another to generously support such a program by helpful contributions other than money. Instances have been known in other industries where such a co-operative research organization has been well supplied with funds and a lot of pro bono publico talking done but when it came to the contribution of facilities or information most of the mills were found to be tight shut."

Your committee feels this to be a point which should have careful consideration by the Association. Certainly we should not embark upon the proposed plan unless all plants and companies are prepared in advance to give the heartiest and best co-operation, and your committee would like to have this point thoroughly discussed in all its phases before the Association makes its decision so that if the plan goes through, all members may be fully aware of just what is contemplated.

Col. Jones added: It is the intention of the Committee to submit this same report to the general meeting tomorrow. The idea was that we should present it to this meeting first, hoping to secure the approval of this meeting, and then carry it on, strengthened, if possible, by your recommendation and acceptance to the general meeting.

I do not know that we can add anything to what had already been set forth in the way of general information by the Secretary. This report, which I have already read to you, is the feeling of the committee, in brief form.

I may say that at a meeting held in Montreal, we discussed the matter in very great detail, and I think when we went into the meeting we were all more or less "Doubting Thomases" about the whole proposition, our doubts fell away from us, and finally at the end of the meeting we were all in accord.

Now, I want to say for my own part, that I believe that this task of making this Department of Research a success is a big task. We cannot jump immediately into it and make it a success. It has got to be a slow growth, with the co-operation of everybody. As we say in the report it takes not alone money to make it a success; it takes the brains and the sincere co-operation and the help of this Section, and of the main Association as well.

The Chairman: What we, as a Technical Section, have got to do generally, is to arrive at a decision as to whether we will adopt this report, and thereby give our recommendation, through the Committee, to the main Association. Before I ask for a motion to adopt the report, I very earnestly request that these of you who are familiar with this problem of ours, will speak on it now.

We are very apt to make a very grave mistake if we allow the main Association either to go ahead with the program or not to go ahead with the program, if we do not give it thorough consideration. There are many pitfalls in this scheme, gentlemen; many of them. There is also an opportunity for a wonderful success.

Mr. Stadler: The very things which Mr. Shipman mentioned and the very things which Colonel Jones pointed out in his report, are the very things which the Belgo Company have thought might be disastrous eventually in connection with the direction of the research work. We are speaking here as Technical Section, and consequently, I shall confine my remarks to that point of view.

From the Technical Section's point of view and the experience I have had generally with the Association at large, I am confident in my own mind that, if the management of the various companies adopt a favorable attitude toward this central laboratory of research, the technical men will follow along similar lines. As I told you a while ago, our experience of the Committee on Mechanical Standards so far has just proven the absolute necessity for prompt and willing co-operation.

As Colonel Jones said in his report, it is not a question of money. That does not amount to anything, although it is very necessary, and if you cannot get the co-operation of the industry as a whole, you might just as well not start. It will probably interest you to know that in our committee work, the co-operation from the industry with the Committee on Mechanical Standards, was principally forthcoming from the news mills, and the only organiaztion — large organization — who furnished information other that news mills, came from the United States. So, apparently, according to my personal observation, the co-operative members are, at the present time, to be looked forward to from among the newsprint class.

I want you to carefully consider that if a central Department of Research is adopted or established, it must not work in a one-sided direction, and, therefore, the industry as a whole must give it its fullest support.

Is the Industry prepared to do that? It is up to us to say. Are we technical men prepared to do that? As I said a moment ago, I think they are, and for that reason I would suggest that in this meeting here, not only should the report be adopted, but that an amendment should be added to this report to the effect that the technical men of the industry as a whole, should pledge their fullest support and their fullest co-operation as to this new branch of the industry, and that was the particular reason why I wanted to talk to you, and I hope that your Chairman will draw up and bring forward a Resolution, (together with the adoption of the report) to the main Association at their annual meeting the day after tomorrow.

Mr. Stephenson: Mr. Chairman, Mr. Stadler has asked the Technical Section, in approving this report, to pledge their full support to the program, and their continuous helpful assistance in carrying it through, and it occurs to me that while members of this Section would be whole-heartedly in support of this, and most happy to carry it on, there may be some, although working members, are connected with an organization which may not be as enlightened as is desirable with regard to the co-operation necessary along this line. For instance, if our Technical Department finds that it wishes to carry out a mill-sized trial of something which promises success by the

laboratory experience, can we not in some way— (perhaps by the method in which the matter is presented to the main Association) — get the members of the Association — the mills themselves — to guarantee that they will permit their technical men — or, if they have not technical men, if they will permit the representatives of the Technical Department, to make such use of their apparatus as may be adapted to making this program a complete success?

Mr. McInnis: We have given this considerable thought for two years. The first scheme under consideration was some form of co-operation with the Government in connection with the Forest Products Laboratory, but we did not seem to meet the general opinion of the Industry. In any event, it did not meet the approval of the Government, so and the next matter we considered was just how this problem might be met or handled, and the suggestion that I made to Mr. Hovey, before attending the technical meeting last summer at the Sault, was that some one individual be appointed or selected to head a committee or to head an association, or to head some form of an organization which could handle this matter for the entire industry. In other words, my thought was that the only way we could handle this and get the support of the entire industry — and get their whole-hearted support — would be to have a man who had sufficient personality to go among the different companies, and get them together on this subject. That was my thought at the time, and it is still my thought. In other words, the co-operation will have to be brought about by some individual or some group of individuals, such as a committee.

The points mentioned by Colonel Jones in his report, and by Mr. Stadler are very apt. In fact, as I see the problem which has been discussed this morning, I think it has divided itself into two ways. Naturally it must be assumed — or it can be assumed — that the technical men would prefer some system of this kind, whereby they can go to a central Laboratory, and have their particular research problems worked out; and the second question is just how strong the managerial end will be for this scheme.

I do not think there is any doubt but what all the companies will be in favor of this, to some extent— some more so than others. Certainly I do not think there is any question but that all the companies will be prepared to support it in a financial way. That is, of course, the first step. The second step is to work out just what is going to be handled; just what will be dealt with; and that is going to be mighty difficult, and it is going to require all the ability of a committee or of the men who may be chosen to direct the activities of this laboratory or council.

For instance, one mill is interested in certain problems, and when you get into the other Sections, there will be other problems. Naturally this laboratory can only undertake a certain amount of work, and the interest of the mills will depend upon the work that is going to be undertaken. Just how that is going to be decided is probably not material or to the point, but it seems to me that after the question of the money is arranger for, the most important thing is the personnel of the committee or the persons in charge of this department, and I think if that is taken care of satisfactorily, the other will come along all right. As has already been indicated this morning, it is not a matter of jumping out and doing this thing in a day, a week, or a month or a year, but it is a matter of growth. We see the pitfalls just the same as any one else does, and these pitfalls can only be overcome, as I see it, by the proper people getting together at the proper time. It cannot be done by correspondence.

To sum it up; we believe that this thing is absolutely necessary in this instance; we believe that in the various things that have been developed by the individual mills so far, that sufficient advances or progress has been made to show that there are mighty big problems ahead of us, and things about which it will be mighty important for us to know pretty soon. Therefore, I do not think there is any question of the necessity of the money being forthcoming if the problems can be worked satisfactorily for the entire industry, and I understand that is what we want.

Mr. H. O. Keay: Mr. Chairman, I think we can all endorse the points raised by Mr. McInnis, as to the attitude toward the report of the committee. It seems to me the committee has chosen the only avenue to success in this matter. They are proceeding with caution in not recommending our plunge into the establishment of a laboratory at once, but rather by the appointment of a director and proper staff, who will proceed logically in co-operation with the various mills, and I also note that they have mentioned the Honorary Council of Industrial Research of the Dominion.

It occurs to me that Mr. Stadler's point is very well taken that it is up to the technical men to enthusiastically back up the findings of the committee.

It also occurs to me that much work might be done almost at once without the laboratory, through the co-operation of the different mills. Some mills are already equipped, as has been hinted at, for certain lines of research work, which is very important to them. It just happened that some have approved equipment already for the attempt at the solution of some of the vital problems. It would seem that these could be carried out without interfering with their regular production too much, if their hearts are in the matter.

Doctor Bates: As far as Price Brothers are concerned, I think it is safe to say that they are quite in line with the Abitibi, the Laurentide and the Spanish River, and all other mills. I have heard that stated by the President of the Company, and there is no doubt but what full co-operation can be guaranteed.

As far as the problems themselves go; some of us have discussed them so much that we are almost tired of talking about them. It appears more as a problem of organization, rather than a question of the technical end. I think the technical men have full confidence that the problem can be faced and solved provided there are satisfactory facilities and co-operation. It is, therefore, essentially a question of organization of the work. I think that is where the Forest Products Laboratory failed to quite an extent; that there was no definite organization in connection with the industry.

There is certainly a need of one central laboratory in this country for the pulp and paper industry. Can this organization be brought about to get the support of all the interested parties — essentially the pulp and paper industry, and also the Government, in such a way that it will be a good, working organization?

Right from the start of this Committee work, I have laid stress on the business organization of the work, and therefore, looked mainly to the business men on the committee to do the talking to us and to use their

organizing ability to show how the work should be placed on a firm and permanent basis.

I think the ground has been covered pretty well in the past few years with the experience we have had in the Forest Products Laboratory and in the technical departments of the mills, and I think the past year has seen a great deal of useful publicity given to this question and the Research Council and the Government has done as much, I think, in the way of stimulating the public to the ins and outs of research, as in any other way, so I would think the discussion this morning would well be along the lines of just how the work should be organized and I think we should feel safe in recommending this report of your committee to the main Association.

Mr. Nelson Gain: Mr. Chairman, I have not had a chance to give to this matter the study which probably the newsprint men have, but as far as we are concerned, I would like to be put on record that we are heartily in favor of pushing this through, and starting something where we can all go and have our troubles and our problems solved. In fact, it should almost be Utopia—the end of our troubles. I do not think there is anything more I can say, only that we are certainly heartily in favor of pushing this forward.

Mr. W. C. Anderson: Mr. Chairman, I do not think I can add anything to what has already been said.

Personally, not being an official of our company, I am not in a position to say very much, but as far as the technical end of the affair is concerned, I am very much interested, and I can assure you that anything that I can do to help to make the proposition a success, I will surely do.

The Chairman: Doctor Bates has said that he thought a considerable portion of the discussion this morning should be on another phase of the question.

Now, we have heard from quite a few gentlemen this morning; their opinions seem to be that the necessary co-operation can be obtained. I will not now take any further time in calling upon any particular gentleman, but will be pleased to have any one in the room volunteer to say anything on this first phase of it. Is there any one else here who would like to speak either for or against the proposition, regarding the possibilities of its being a feasible scheme?

Mr. Crossley: Mr. Chairman; it seems to me that the question at first is not one of the laboratory, but one of the personnel, and when you come to think of the facilities at the disposal of the industry throughout the country for research work, it would appear that the organization of whatever kind it may be, should be one of parentheses naturally, because there is equipment in existence for research, and its use should be collaborated. If a laboratory were built to-day, it would be almost impossible to install in that laboratory apparatus which would give such good practical results as the scientific facilities already installed in some of the mills, so I think the action of the committee is well take in not recommending the installation of the laboratory at the present time, but the promotion of some sort of research work or research organization, and to place the apparatus already installed in some of the mills at their disposal.

Speaking rather as one familiar with the mills with the smaller out-puts, perhaps the explanation of the fact that so much information comes from the newsprint mills is that they have more or less uniform mills, and they can formulate their plans a lot better, and there are several ways in which a great deal of work could be done with existing equipment of the mills, if they would co-operate and allow the facilities they have to be available to a visiting Research Commitee, to permit them to establish themselves in their mills for two or three months, and investigate conditions there, and then go from there to another mill and investigate conditions, and so on. With the present-day equipment it is possible to get a lot of information as to power, for instance, which was not available in the days when some of the older mills were built, and I think some of the mills with a varied output could do a great deal to help in this way, by placing their mills at the disposal of a roving committee which could do a little experimenting from time to time.

Dr. R. F. Ruttan, head of the Chemistry Department of McGill University and a member of the National Advisory Council for Scientific and Industrial Research was called upon and contributed some very interesting remarks on the Central Research Institute. This matter will appear next week.

Mr. Carruthers: I will move that this report be adopted, with the understanding that it be favorably recommended to the parent organization, with the understanding that if they will furnish the financial and moral support, they can be assured of the hearty co-operation of the Technical Section.

The motion was seconded by Mr. Stephenson and was carried unanimously.

(To be continued, giving the discussion by the C. P. & P. A.)

SWEDISH PULP MAN INVESTIGATING BRITISH COLUMBIA MILLS.

With the object of studying pulp conditions and methods in British Columbia at first hand, Mr. Nels Wikander, of Stockholm, Sweden, has been visiting the mills in British Columbia. He has been superintendent of the large pulp plant of the Ohruiken Company at Skellaftea, Sweden, for some years and also has been engaged in the lumber trade in his own country.

He states that, since the end of the war, the pulp trade in Northern Europe has improved greatly. During the war, conditions were serious, but today the demand is increasing and prices are high. Wages in Sweden also are very high, a laborer in the woods receiving as much as twenty crowns ($4) a day, which in Europe is a high wage.

Swedish mills manufacture chiefly sulphite pulp for export to Great Britain and other European countries. Much mechanical groundwood pulp also is exported to be used in the manufacture of newsprint.

Word comes from St. George, N.B., that A. C. Grant has sold his interval property to the Press Pulp & Paper Co. It adjoins land already owned by the pulp concern and will be used by it next season. The organization has also purchased the slasher at Musquash and will install them in the mill at the Dewar site. The Gregory Lumber Company has sold its holdings on the Magaguadavic and its mill at Bonny River to the pulp company. It is rumored that other concerns along the river have also been approached. The Press Pulp and Paper Company has rigid laws of conservation, which it adheres to in New York and other places where the firm lumbers, and report says that it will introduce the same measures of conservation on the Magaguadavic.

BLOTTING AND FILTER PAPERS.

By Dr. G. SCHUMANN

(Translated by Dr. Paul Bartholow from "Der Papier-Markt," January 1, 1921 for the Pulp and Paper Magazine.)

Although distinct in uses, blotting and filter papers are both made of porous materials, a fact which has been the occasion of a close similarity in the manufacture and in the preliminary treatment of the pulp. Writing, printing and packing papers, as well as wrappings, must have a closed surface, be sized and possess fastness to moisture and solidity. All these characteristics, in the case of blotting and filter papers, are secondary; while sizing is naturally to be avoided. Accordingly the preparation and treatment of the raw material are quite different, but the work of the paper machine is not materially changed, or at least, only so far as the preparation of the stuff brings with it some differences.

Among suitable raw materials, those are chosen which have an open, porous structure. These properties the manufacturer will do well to increase and refine as far as possible. For there are comparatively few fibers that come under this head; these are principally wool or cotton fibers and the pulp of aspen.

Under the microscope wool fiber appears as a closed, hard, cylindrical tube without branches; and of a very brittle structure; cotton fiber as a collapsed tube, as obtained on sucking out the air, while the aspen discloses short, stiff, fiber bundles. The most useful of these raw stuffs is cotton, and its tubular fibers seem originally designed for purposes of suction; wool, on the other hand, through its stiffness and hardness, tends rather to break up, forming interstices; and aspen is to be employed as a substitute in the manufacture of blotting papers of inferior grade. The desired properties can be developed and improved in three ways:

1.—Fermentation or maceration.

2.—Refrigeration.

3.—Grinding in a Hollander with sharp knives.

Through maceration are utilized the oxidizable incrusting substances, impurities, and residues which accumulate on and in the fibers during the period of growth of the cotton and other plants. These substances are exposed to a kind of fermentation, or process of oxidation, whereby the fibers are split, torn open, broken up and reduced to a more porous state. For this purpose the cotton rags are disposed in layers to a considerable height, sprayed with water which is renewed from time to time, in order to maintain an even wetting throughout the piles. The temperature of the rags rises quickly through oxidation, and at the end of a few weeks they are ready to be washed and ground in a Hollander fitted with sharp knives. The half-stuff thus obtained has great suction power, and yields a blotting paper of high value, and, especially, blotting cards. But since the fiber is softened and rendered pulpy by the fermentation process going on within itself, thinner blotting papers require the addition of stronger fibers, in order to hold the sheet together on the machine, and withstand the tension which the stretch imposes on it, whereby, on the other hand, its power of blotting and suction may be influenced unfavorably.

2.—Refrigeration is a procedure pursued in Sweden with finished and bleached cotton stuff, and also soda pulp. Here, too, as with fermentation, the design is to break open the walls of the fibers, in order to obtain an interlacing, porous structure.

Since water at 4 deg. has a greater density than water at 0 deg. C. and since it expands about one-tenth of its volume in freezing, it bursts hollow vessels which are filled with water. Similarly fibers with a central canal are broken open and become not only more porous, but more permeable. The great merit of Swedish filter papers from Gryksbo and Lessebo depends upon this freezing process together with the use of pure spring water.

3.—If the Hollander with sharp knives is employed for grinding pulp prepared by processes 1 and 2, it is in cases where these operations are considered too lenthy and expensive, for by means of quick grinding alone can the stuff be reduced to short fibers and produce a pink, porous pulp capable of suction. The fibres are cut, preferably in short lengths, not bruised, and by this means a loose, soft and spongy net-work is formed, which sucks up liquids as easily and thoroughly as it allows them to pass through. Blotting paper is in a manner a continuous, coherent mesh of holes and canals, which by capillary attraction enable it to suck up liquids to the requisite height. The determination of the value of blotting paper depends upon the calculation of the time in which a strip placed vertically in liquid becomes moistened, or the height to which the liquid rises in a definite time.

In manufacturing the paper from half-stuff produced by these processes the cylinder paper machine is used much more than the long Fourdrinier machine, for it permits of an easier passing over of the soft sheet to the press rolls. Drying of blotting and filter papers should approximate air drying as far as possible; for this purpose therefore a number of moderately heated cylinders are employed, with subsequent drying in a current of air. The best filter papers are often finished in suction boxes, and the sheets after the squeezing out of lumps by means of an hydraulic press, are hung in clips to dry in the air. Experience shows that air-dried paper, made out of the same stuff on the paper machine, is superior in durability and strength.

From blotting and filter papers the so-called filter-mass has been evolved. In this case the half-stuff is not worked up on the paper machine, so that it is manufactured more cheaply. The prepared filter-mass is run into pressure chests provided with a false bottom where the water is squeezed out and the stock subsequently dried in the air.

Filter papers must be free from earths, minerals, and ash residues, in view of the fact that they may be burnt with the deposits on them for chemical tests. When chemically pure spring water is not available, distilled water may be used in making them, supplemented by washing out with hydrochloric or hydrofluoric acid.

Aspen wood pulp is good raw material for the inferior grades of blotting papers from which filter boards are produced, for school-books, and the like. Its suction properties and bright color are increased materially after bleaching with sulphurous acid and water. But the sheet requires the addition of stronger fibers for the handling on the paper machine; in the case of ordinary blotting papers unbleached soda pulp from pine may be used, and bleached for the better grades. Finally a leaf-wood cellulose is worthy of mention, beech cellulose, cooked by the soda process and bleached with chlorinated lime, which yields an uncommonly soft and porous half-stuff. However, on account of the frequent presence of resinous and waxy bodies it readily occasions impurities, unless the raw wood is subjected to a careful sorting before cooking.

Exports Gained 50 per cent

Canadian exports of pulp and paper during December reached a value of $14,612,083, compared with $9,798,372 in November, 1919, a gain of $4,813,711 being made up as follows:

December.	1919.	1920	Gain.
Paper	$6,212,430	$8,637,214	$2,424,784
Chem. pulp	2,768,250	4,048,477	1,280,227
Mech. pulp	817,692	1,926,392	1,108,700
Total	$9,798,372	$14,612,083	$4,813,711

The exports of paper included 4,894 cwts. of book paper, valued at $68,098; 1,300,431 cwts. of newsprint, valued at $7,369,631, and other paper to the value of $1,199,485.

Pulp exports included 146,254 cwts. of sulphate (kraft) valued at $826,458; 163,809 cwts. of bleached sulphite, valued at $1,282,206; 361,234 cwts. of unbleached sulphite, valued at $1,939,813; and 672,154 cwts. of groundwood valued at $1,926,392.

The countries of destination were: Paper, United Kingdom, $366,549; United States, $6,342,874; other countries, $1,927,791; Pulp—United Kingdom, $1,291,-

EXPORTS OF PAPER, WOOD PULP AND PULP WOOD.

For December, 1919 and 1920; and nine months ending December 1918, 1919 and 1920.

		Month of December		Nine months ended December.		
Paper		1919	1920	1918	1919	1920
Printing paper						
Book paper	Cwt.	2,485	4,394	.....	36,338	47,733
	$	21,389	68,098	.....	333,363	525,151
Newsprint paper	Cwt.	1,370,526	1,300,431	.....	10,427,203	11,393,581
	$	5,051,898	7,369,631	.....	37,255,290	56,971,725
Printing paper	Cwt.	.....	.....	9,507,168	.....	.....
	$	.....	.....	28,161,949	.....	.....
Other paper	$	1,139,143	1,199,485	4,507,411	6,609,453	10,191,825
Total paper	$	6,212,430	8,637,214	32,669,560	44,198,106	67,688,697
Wood pulp:						
Sulphate (kraft)	Cwt.	223,524	146,254	.....	1,882,680	2,027,387
	$	716,202	826,458	.....	6,187,015	10,665,430
Sulphite, bleached	Cwt.	128,164	163,809	.....	852,809	1,644,841
	$	679,339	1,282,206	.....	4,297,442	13,231,216
Sulphite, unbleached	Cwt.	369,489	361,234	.....	3,599,733	4,373,666
	$	1,372,709	1,939,813	.....	13,366,199	25,763,115
Chemically prepared	Cwt.	.....	.....	6,716,582	.....	.....
	$	.....	.....	24,074,950	.....	.....
Mechanically ground	Cwt.	541,240	672,154	2,900,218	5,622,516	4,921,759
	$	817,692	1,926,392	3,673,618	6,376,134	15,567,541
Total wood pulp	Cwt.	1,262,417	1,343,451	9,616,800	11,957,738	12,967,853
	$	3,585,942	5,974,869	27,748,568	30,226,806	65,227,302
Pulp wood	Cord.	46,747	172,024	1,205,455	678,688	1,087,360
	$	480,669	2,621,081	11,595,228	6,802,209	14,125,577
Country of Destination.						
Paper and manufactures of—						
To United Kingdom	$	611,482	366,549	684,483	3,350,899	3,411,777
United States	$	4,336,505	6,342,874	27,128,589	35,258,021	52,612,966
Other Countries	$	1,264,445	1,927,791	4,856,288	5,589,186	11,663,954
Wood Pulp—						
To United Kingdom	$	355,486	1,291,534	48,522	4,149,555	7,678,274
United States	$	2,801,204	3,644,543	25,324,130	22,619,334	32,935,844
Other Countries	$	429,252	1,038,792	2,379,916	3,457,917	4,613,184
Pulp wood—						
To United Kingdom	$	.....	.....	.....	.....	.....
United States	$	480,669	2,621,081	11,595,228	6,802,209	14,125,577
Other Countries	$	.....	.....	.....	.....	.....
Total Paper, Wood Pulp and Pulp wood—						
To United Kingdom	$	966,968	1,658,083	733,005	7,500,454	11,090,051
United States	$	7,618,378	12,608,498	64,047,947	64,679,564	119,674,387
Other Countries	$	1,695,695	2,966,583	7,232,204	9,047,103	16,277,138
Totals	$	10,279,041	17,253,164	72,013,156	81,227,121	147,041,576

534; United States, $5,644,543; other countries, $1,038,792.

Unmanufactured pulpwood to the extent of 172,024 cords, valued at $2,621,081, was exported to the United States during December, compared with 46,747, cords, valued at $480,669 in December, 1919.

For the first nine months of the current fiscal year, April to December inclusive, pulp and paper exports were valued at $132,915,999, compared with $74,424,912 for the corresponding period of 1919 and $60,417,928 in 1918, a gain of $58,491,087 over 1919 and of $72,498,071 over 1918. They were made up as follows:

Nine months.	1918	1919.	1920.
Paper..	$32,669,360	$44,198,106	$67,688,697
Chem. pulp ..	24,074,950	23,850,652	49,659,751
Mech. pulp . . .	3,673,618	6,376,154	15,567,541
Totals	$60,417,928	$74,424,912	$132,915,999

Imports of manufactured pulpwood for the 9 months amounts to 1,087,360 cords, valued at $14,125,577, compared with 678,688 cords, valued at $6,802,209 for the corresponding months of 1919, and 1,205,455 cords, valued at $11,595,228 in 1918, all of which went to the United States.

APPOINTMENT TO STAFF OF FOREST PRODUCTS LABORATORY.

Improvements in facilities for research into wood has been made possible by the reorganization of the Forest Products Laboratories of Canada in Montreal. These laboratories have suffered from the sudden recognition of the need for technical men by the pulp and paper industry. During the past few months a number of appointments have been rendered possible through the recognition by the Civil Service Commission of the necessity for higher salaries for technically trained men, and by the allotting of increased remuneration to a number of technical positions in the laboratories.

The position of superintendent has been filled by the appointment of Mr. William Kynoch, whose experience in forestry and wood technology should be of value to the lumber industry. Chiefs have been found for the three divisions of timber physics, wood preservation and timber tests, and the staff of the latter division has been increased. The division of timber tests has, without intermission, carried on its programme of testing for strength, hardness, etc., all the commercial species of Canadian woods. In all, six new technical men have been admitted to the staff and two other appointments are pending.

ANOTHER RECORD YEAR FOR BURT.

A concern which has enjoyed a most prosperous period since the close of the war is the F. N. Burt Company whose annual report for the year ended December 31 last has been mailed to shareholders. This shows profits of $842,712, compared with $795,714 in the previous year. The profits having been arrived at, as President J. Moore points out, "after writing down inventories to present replacement values."

"Incoming business fell off during the last quarter, but we have entered the year 1921 with a substantial amount of orders on hand and look for a satisfactory volume of profitable business," the report concludes.

Success comes in cans—failure in can'ts.

British Trade News

(From our London Correspondent.)

London, Jany. 12, 1921.

There is a well known paper agent in London today who is a prominent Technologist, and he has a thousand tons of Scandinavian newsprint, 37 inches broad, for sale at 7½ cents ber lb. Indeed he is not selling it privately, but he announces the sale of the newsprint publicly. It is impossible for British mills, at the present cost of production, to sell at this rate.

Bamboo Wall-Papers.

Some very fine samples of wall-papers from bamboo pulp are at present on the British market. Recently I have inspected the samples and they are beautifully finished. A notable feature is the great attention that has been given to the designs and coloring. These are artistically and skilfully executed, with a touch of Japanese style about them, and to people with Eastern or Colonial tastes they should strongly appeal. The question now is will the British House decorators, or wholesale agents, take on to them.

Wrapping Papers.

The great depression prevailing in the British Textile industry has seriously affected the mills producing wrapping papers. In the Textile and boot trades enormous quantities of wrapping papers are consumed each year, and during the war the mills in England could not meet the demand. The boom that followed the Armistice also created hey days for wrapping papers; but, now, the Textile depression has set things at rest and producers are looking further afield to get clear of the stocks they have on hand.

Canada in London.

In a few days time Mr. W. C. Noxon, a well-known business man in Canada, who has been head of Trade and Commerce in London for the Dominion, will sail for home, and I would advise all paper men to consult him as to the actual conditions prevailing here. For two years he was in England, and his Department was established with a view to Canada getting a bigger share of the European trade. From what I can hear Mr. Noxon is in favor of the establishment in London of a Canadian Trade Council, which would bring together the various Canadian trade interests established here. It is certainly a move in the right direction, and from a pulp and paper point of view the interests of the Dominion mills cannot be watched too closely in England with the tactics adopted by Scandinavians and Germans to retain the market. Mr. Noxon was greatly appreciated in London—but what is our loss is Canada's gain. By the way, it is intimated that there is some overlapping of duties between Canada's official and semi-official organizations for developing trade which are already located in London. At all events a Canadian Trade Council is needed, and it must be a keen one to snatch away what foreigners are not entitled to.

Paper Depression.

Depression still continues in the British paper industry, and after the Xmas holidays some of the mills did not reopen for a considerable time. They took extended vacation, and now many of the workers are on short time. Some mills are shut down and unemployment is rife. The members of the Government are now trying to establish a long foreign credit scheme, to apply mostly to European centres, but it is very doubtful if such a scheme will be of any use to paper makers —certainly not to pulp producers. But indirectly it may help other industries, and through the movement

of trade that may follow the paper mills and pulp sellers may eventually reap some benefit. From what I can see of the scheme at present it is a dangerous one, and producers must have some guarantee that their money is safe. Meantime, while the depression prevails in England, Germany is not forgetting the market with some nice looking cheap paper, and Scandinavian lots are going into competition with it at remarkably low quotations. Of course, Germany is buying pulp cheap, her production of paper is cheap, and the value of the Mark in England being at a very considerable discount, in comparison to the sterling, the Teuton gains considerable profit by the sale of the finished article in London. Export and contracts are just keeping the British mill machinery running; they have had good days since 1914, and now they are on lean days. Therefore, they can only bide the time away as "Every cloud has a silver lining."

The Pulp Situation.

The pulp situation shows no change. Paper mills have all their requirements and pulp men are at a standstill as regards securing new business; they are merely devoting their time to stock-taking and clearing up office business. The depression, however, in the paper industry is reflected in pulp prices, and quotations are now as follows per ton, c.i.f., British ports: Bleached Sulphite, £55; Easy Bleaching, £42 7s. 6d.; Sulphite News, £37 10s.; Unbleached Soda, £37 10s.; Unbleached Soda Kraft, £33; Groundwood (wet), £10; Groundwood (dry), £20. It will be seen from the foregoing quotations that the many vicissitudes through which pulp has gone since 1913—unparalled in the history of pulp manufacture—have driven prices down and they are gradually getting near prewar figures. Several elements are responsible, but the principal one is the contention of paper producers that if they are going to compete with Scandinavian and German prices they must have pulp at reduced price. That is a bone of contention. The foreigner who produces his own pulp and turns it into paper, can beat the Britisher in prices in his own market.

Swedish Pulp.

According to advices that have reached London the following figures show the estimated production of Swedish pulps for 1921:—

	Tons.	For Export.
Bleached Sulphite.	68,000	45,000
Unbleached Sulphite	710,000	550,000
Bleached Sulphate	7,000	6,500
Unbleached Sulphate .. .	210,000	150,000

The best portion of the pulps for export are already sold. No particulars are yet available regarding groundwood production, but it is a significant fact thet Canada practically killed Sweden's groundwood trade in the States. The big demand for newsprint in American quarters enabled the Swedes recently to ship several thousand tons of groundwood (wet)—and Norwegians also—to U.S.A. ports and it would be interesting to know the price being realised on the American markets. Canadians may find this out for their own information. The result would certainly be worth knowing. In the above figures the difference between the actual production and the quantity for export denotes the amount of pulp used by Swedish paper mills for their own purposes and for competition in British and other markets.

A Century of Papermaking.

I have just received a neat volume entitled "A Century of Paper-Making, 1820-1920". It gives the history of Robert Craig & Sons, Ltd. who own two Scottish paper mills. Under the name of Craig, a household word in the United Kingdom, paper has been made for 100 years in Scotland and during this period they developed a fine connection with Canada. The firm is still as progressive as of yore and is worthy of all respect.

NOTELETS.

Mr. Richard Greenhalgh, of Messrs. Greenhalgh & Co., has died in his 47th year. He as a well-known paper seller in Lancashire.

Mr. William Dedrick, of Snodland Paper Mill in Kent, who died sometime ago has left £46,768 in his will.

Manchester is forming a branch of the Technical Section of the British Paper Makers Association.

James Milne, the paper-makers engineers, have declared a dividend of 10 per cent, carried £5,000 to reserve and carried forward £3,504.

At Penicuik 400 paper mill workers are out of employment. This is only one instance of depression.

Swedish kraft paper is being sold in England from £56.15 to £57 a ton.

While British people are talking of a foreign credits scheme to help trade, Berlin says: "Any orders for paper or pulp we receive, there must be cash down after delivery." This is the result of cheap production.

The Excess Profits Duty has killed the progress of industry in the United Kingdom. Mill owners say when it is removed by the Government the outlook will be brighter.

Swedish pulp mills are short of orders, only the U.S.A. doing a little business with them; paper mills are providing for stock purposes only.

SODIUM SULPHATE FEVER.

The province of Saskatchewan has become afflicted with a new disease. We have called it sodium sulphate fever. While it may extend slightly beyond the limits of the province, it is particularly strong in this district. Everyone is having lake deposits analyzed and is about to become wealthy over night by the simple process of digging up sodium sulphate. Some notice is being taken of this by provincial authorities with a view to warning the unwary that the mere presence of large or small deposits of natural salts of this nature does not necessarily insure the immediate swelling of personal bank accounts.

This resource is one which, if handled properly and in a co-operative manner, may mean considerable to the province. Some companies are proceeding along correct lines and are studying the problems of recovery and marketing. To begin with, freight rates are not favorable to say the least, and as there are other sources of natural and synthetic salts, the development of a deposit calling for large outlays should be thoroughly considered. Stock exploitation should be avoided, and the Government is well advised to warn the public generally speaking. At the same time, some of the deposits at least are being profitably developed, and for those who are honest and know their business the opportunity for investment seems to be sound. This is a new opportunity to develop a resource property and we trust it will be handled sanely.—Canadian Chemistry & Metallurgy.

British Trade in Pulp and Paper During 1920

(From Our London Correspondent).

Canada's Position in Groundwood.

The year's trading in pulps for the United Kingdom shows some remarkable figures for 1920. British pulp and paper men have been making history and through the volume of figures just issued by the Board of Trade, in London, one can see "boom" reflections. Never in the history of British papermaking have such large quantities of pulps been imported as there were during the year just ended. Some people say: "Oh! I was glad to see the end of 1920 as it was an up-down-period," but to the pulp producer and the pulp seller it was a period that brought gold to the mill. For the last 8 or 9 years, I have at times, drawn the attention of Canadians to the growing market for pulps in the United Kingdom and 1920 will stand pre-eminently for records, a fair share of which go to the Dominion, but not what is desired. Compared with Schandinavia Canada is handicapped by the shipping facilities and the question must be settled some day if Dominion producers are to retain and increase their hold in the British markets. The rate of exchange is another subject. But looking back over past imports of pulps and through United Kingdom ports I find the quantities and values work out as follows:—

	Quant. in tons	Value
1920	1,094,173	£29,530,239
1919	937,920	15,402,937
1918	419,553	12,783,031
1917	386,957	9,520,023
1913	977,957	4,617,687
1912	925,590	4,418,420

I have left out 1914-15-16 figures as they are small and shipping was disorganized, as well as the markets. They, however, cover the total quantities and values of bleached and unbleached dry, and wet chemical pulps, and dry and wet groundwood. It will be seen from the returns that the British pulp market is gradually becoming an important one and that the values of the imports are unprecedented. While on the question of values, a comparison of prices per ton are worth recording for 1920, and previous dates:

	1920 £	1919 £	1914 £	1913 £
Bleached Sulphite	60	40	12	11½
Easy Bleaching	51	33	8½	9¼
Sulphite News	45	30	7½	8½
Soda Unbleached	42	27	8	8½
Soda Kraft	38	24	7	8¼
Groundwood (wet)	13	9	2	2⅛
Groundwood (dry)	14	17½	4¼	4½

The prices for 1920 are taken at the close of the year, but at previous dates they were much higher.

Looking at the subject of prices from another standpoint. I will take the last 3 months of 1920 and quote the c.i.f. values, per ton, when the pulps of all kinds, chemical and groundwood, reached the port of the United Kingdom:—

	Chemical Tons	Aver. c.i.f. Values £. s. d.
Dec.	46,923	41.19.1
Nov.	48,758	43.19.6
Oct.	39.030	43. 5.6
	Groundwood	
Dec.	41,764	14. 3.7
Nov.	31,069	13.18.7
Oct.	49,937	16. 4.10
	Chemical	
1920	550,000	38. 9.9
1913	412,000	8. 0.9
	Groundwood	
1920	539,000	15. 3.6
1913	566,000	2. 6.1

Pulp prices are on the downward trend at present in England, dullness still prevails from a seller's point of view.

Canada's Trade.

Canada's trade in groundwood with the United Kingdom in 1920 shows a falling off when compared with 1919. The total imports reached 510,392 tons, as against 494,787 tons in 1919, 109,048 in 1918, and 174,-550 tons in 1917. The c.i.f. values for 1920 reached £7,355,768, which is a record, as against £4,188,736 in 1919, £1,346,035 in 1918, and £1,689,976 in 1917. The sources of supply were as follows:—

	Tons	Value c.i.f.
Sweden	84,176	£1,372,374
Norway	305,322	3,740,013
Canada	87,524	1,643,906
Other Places	33,370	599,475
Total	510,392	£7,355,768

Canada it will be observed has for some time past captured a fair amount of Sweden's trade in England and Canada's trade in groundwood alone with England, now exceeds £1,000,000 sterling. This is a handsome sum for the Dominon pulp men in a year, and next year I hope to see an improvement on them.

Canada's shipments to England of wet groundwood prior to 1920 are shown as follows:—

	Tons	Value	Total Recd. in U.K.
1920	87,524	£1,643,906	510,392 tons
1919	98,576	900,492	494,787 "
1918	.....	.....	.....
1917	.....	.....	.....
1913	69,090	156,276	556,987 "

Canada's exports to the British market reached a record in 1919, but no doubt the investments that have been made during the past twelve months may act as a stimulus to improving trade in the future. Norway has a big pull on British papermakers in groundwood. They shipped no less than 305,300 tons roughly which meant over £3 millions passing out of the country. It is no wonder, therefore, that some Norwegians of late are against the investment, or controlling, of Norwegian mills by British capital.

Sulphite.

There was a remarkable development of British dealings in sulphite. The actual figures for Canada are not yet available, but in bleached and unbleached sulphite there is a fair volume of business passing between the Dominion and English buyers. The imports from all sources were in 1920:—

	Tons	Value
Bleached sulphite (dry)	29,410	£ 1,468,959
Unbleached sulphite (dry)	511,882	19,544,097
Chemical (wet)	13,912	347,479

These are record figures and the countries of supply were:—

	Bleached Sulphite Tons	Value £	Unbleached Sulphite Tons	Value £
Sweden. . .	5,921	332,521	334,521	12,456,751
Finland. . .	231	21,095	37,777	1,495,559
Norway. . .	16,107	748,359	91,840	3,274,885
Germany . .	657	31,712	8,163	406,533
Canada, etc..	6,494	335,372	39,581	1,910,369

With Canada there are one or two supplying countries classified, but the greater portion was imported from the Dominion.

Germany during 1920 entered the sulphite and sulphate markets and the shipments on the whole have not been unsatisfactory, but they are still a long way behind the pre-war figures when the Teutons exported to us 1,532 tons of bleached sulphite and 39,440 tons of unbleached. Finland's figures are also below pre-war returns. A glance back at some of the peace-time figures, however, are worth comparison and I will quote 1919 — to 1913.

Bleached Sulphite Tons.

	1919	1918	1917	1913
Finland.	95	.....	.....	1,017
Sweden.	4,255	757	1,548	2,243
Norway.	11,228	15,042	18,024	12,542
Germany	.....	.....	.....	1,532
Canada, etc. . .	3,429	208	1,170	3,287

On comparing these figures with 1920 figures above it will be seen the Bleached Sulphite market has not fully recovered after the war. Some countries are still missing from the list, but trade with Canada has been maintained. Therefore, in order to get at Canada's trading figures with the United Kingdom, it will be necessary to turn to the Dominion's 1920 export returns. Sulphite unbleached imports were:

Unbleached Sulphite Tons

	1919	1918	1917	1913
Finland.	6,668	.....	.....	40,611
Sweden.	270,822	97,653	32,270	241,193
Norway.	64,549	119,059	75,566	45,681
Germany	.....	.....	.....	39,440
Canada, etc. . .	44,834	4,043	34,272	7,759

Taking the returns as a whole on the years's trading, they are satisfactory from a seller's point of view and we may count ourselves lucky in England if greater figures can be produced at the end of 1921. If we can it will mean another "boom" in the paper industry; but judging by the outlook at the moment British mill owners may find themselves in a "tight corner" with the growing foreign competition and under-cutting of prices in paper. Their only salvation at present lies in the export trade and were it not for this branch of the industry they might "shut up shop" — a movement which would be seriously reflected in pulp.

THE BRITISH PAPER TRADE IN 1920.

At this time of the year one feels like putting the clock of history back and becoming retrospective. And while all eyes are deeply concerned in peering through the thin mist that separates us between our present existence and the future, for history's sake we must not forget our deeds of the past. Therefore, they must be chronicled for future generations, leaving the future to record its own doings.

Paper.

During 1920 a feature of the paper industry was the remarkable up-and-down-hill competition. There was revival here and depression there; but one thing came to light, and that was the public—the whole world—realized that it was impossible to run Governments and commercial life without paper. Therefore, it became an actual fact, stamped and impressed on public mind, that without paper there was chaos. That being so, a great awakening followed. Americans rushed to Europe to replenish their supplies and meet demands; Canadians stood firm as rocks, and domestic supplies were cut down; Scandinavians were fighting local troubles and, naturally, holding out for their prices for what they had to sell; Australians and New Zealanders made London their centre, looking for paper in Canada, in the mother country, and Scandinavia; and last, but not least, the British mill men went on steadily plotting in their plans and output, giving a supply here, and trying to meet the wishes of everybody. Then came the great awakening! Some newspapers had to close down, and men in London who have handled and paid for thousands and thousands of tons of paper in their business life, for the first time in the remembrance of the present generation—aye, or in the past—advocated Canada's great possibilities. The daily and evening newspapers in London published articles on subjects which are past history in Canada. Men rushed to Canada to spy round, small dealings were effected; others rushed to Scandinavia. And what is really an important element in the 1920 history of paper is the fact that Americans were in London looking for newsprint. One may ask the question: Has Canada's resources gained by these after-dinner speeches in London and the great advice given to investors? When they were made I could see a smile breaking over the faces of some of the old pioneers, who know what it is to make and sell paper now, as in the past. Canadians know the result. Newfoundland kept up her steady supplies to England in her progressive mood. And what is the result of all this talk at the end of the year?

At the beginning of 1920 prices were good, labor conditions good, mills were enlarging, engineers were busy. At the close of the year labor conditions became serious, unemployment followed, wages had to be increased, and a depressed market followed. The Great War's reaction has set, prices are difficult to get and distress prevails. So far as one can see the year's cyclical movement leaves buyers not wanting paper the same as they did at the beginning of the 12 months, and newsprint is selling at a cheaper rate with foreign competing with the British, Newfoundland, and Canadian productions. Export is now the great object of British mills.

That was paper in 1920!

Pulp.

What of pulp in 1920, one may ask? It has been a good year for all kinds of pulp. The only trouble was that sellers could not get enough of pulp. So long as the paper industry was thriving, pulp men were busy, but owing to the increased cost in production many hard and difficult "battles" had to be contested with the paper mill owner. True, some of the paper men got upset, and said they would see about establishing their own pulp mills. It was said in the heat of the moment, because the paper man had a grumbling customer disputing his prices on one side, and, on the other, he was asked to pay a good increase in pulp

prices and in a competing market. But the pulp man always came out "top dog" in these "battles." He has had his good fat days in the year; now he is on lean ones.

For comparison a glance back at pulp prices in the British market will be interesting. In January, 1915, or about the end of December, 1914, after war broke out, pulp producers had an anxious time, and prices were about as follows, c.i.f., British ports:—

Bleached Sulphite	£11	10	0	—	£14	0	0
Easy Bleaching	9	15	0	—	10	0	0
Sulphite News	8	0	0	—	9	0	0
Unbleached Soda	8	10	0	—	9	5	0
Soda Kraft	8	5	0	—	8	5	0
Groundwood (moist)	2	0	0	—	2	5	0

These were some of the market prices at the beginning of 1915. Some buyers got more; others less. War then raged.

In January, 1920, as briskness was beginning to develop in the paper industry, and the questions of increased costs and increased prices were on the lips of every manufacturer one met in London, prices, c.i.f. British ports, were ruling as follows:—

Bleached Sulphite	£40	0	0	—	£		
Easy Bleaching	32	10	0	—	33	0	0
Sulphite News	23	15	0	—	24	5	0
Soda Kraft	26	10	0	—	27	0	0
Unbleached Soda	9	0	0	—	9	0	0
Groundwood (moist)	30	0	0	—	30	5	0

In this comparison of prices one can see what the pulp and paper mill owners have had to contend with. The big jump after a little over 12 months' peace left things very uncertain. Pulp was up and labor was not too plentiful, and the markets of the world had to be considered. Pulp sellers, consequently, had to go very cautiously. Rumors got about that prices would be increased—they were in fact neary doubled in June, 1920. Then the hue and cry was raised about the prices of paper and the pulp men were attacked. All sorts of schemes were devised. But the revival in the paper industry and the grat demand for paper, made the pulp men busy. They lay low like sensible men, kept on selling a bit here and a bit there, and they enjoyed the great awakening in the activities of their paper confreres. Unfortunately, the depression has hit them somewhat today, at the close of a fair year, and the market prices are now about as follows, c.i.f. British ports:—

Bleached Sulphite	£60	0	0	—		—	
Easy Bleaching	51	0	0	—	£52	0	0
Sulphite, News	45	0	0	—		—	
Unbleached Soda	41	0	0	—	42	0	0
Soda Kraft	38	0	0	—	39	0	0
Groundwood (moist)	13	0	0	—		—	

Now comparing the cost of pulp today with that in January it will be observed that the difference is a big one. This difference has caused a good deal of hesitancy on the part of buyers in the United Kingdom, and they have been holding back large orders in the hope that prices might fall.

That was pulp in 1920!

Technical.

One cannot let the year pass without a reference to the Technical side of pulp and paper. Have we progressed? The answer may be given in the affirmative.

As regards pulp, further developments have taken place in utilizing bamboo as raw material and new machinery has been adopted. Peat has also been tried, and reports have been for and against it. Seaweed has been tested in England and elsewhere and reported on unfavorably, but in America it has proved a success, and a new mill is being established to handle it. Bagasse has also turned out successful, and machinery for grinding can be obtained in England. The results are all encouraging, particularly as one looks at the new efforts made in the Canadian and American scientific work in pulp making. A tribute must also be paid to the Canadian Pulp & Paper Association and the American for all they have done. They are closely followed in the United Kingdom.

Then the discovery was made that it was not a German who made ground wood first in the world and paper from it. It was discovered that a Nova Scotian Charles Fenerty, made it in 1838-1839, and to him the credit is given.

As regards paper, the British Papermakers' Association established a Technical Section in 1920, and it is going well. One knows what the Canadians and Americans have done to put new lines on the market and cheapen the cost of production. Scandinavians and the Germans are also steadily moving along on similar lines. The results of all these labors will be experienced in 1921. Paper is now made on a scientific basis, and we are in the same old world with a new people, better educated and more advanced in thought. Paper and pulp men must move accordingly. The Germans are doing it today, and the French and Belgians are raising new nations out of downtrodden ones who will in years to come study the economic position just as much as the Russians. In these great markets competition will be on scientific lines and their wants will reflect on the manufacturers' power of production. Science and reseach for tomorrow should be the motto; scrap the obsolete machinery.

Canada's Trade With England.

During 1920 paper and pulp imports in the United Kingdom might have been increased somewhat. The pulp produced in Canada has a good name in England, and the sooner this shipping difficulty has been got over and tackled the better for the Dominion. I hope next month to have a complete return of Canada's trade with this country. At present the figures are not available. One has only to look at the progress Newfoundland pulp and paper has made in the British market. Already some of the Canadian pulp and paper mills enjoy a nice connection with British clients, but the great desire is to see more mills interested in the market.

TWO MORE PULP MILLS.

Toronto, Jan. 24.—Two additional pulp and paper industries are in prospect for northern Ontario in connection with extensive pulpwood limits, which, according to Hon. Beniah Bowman, Minister of Lands and Forests for Ontario, will shortly be advertised for sale. One of these limits is tributary to the Nagagami river in Algoma, and so situated that the mills would probably be located north of the Transcontinental Railway. The other is in the vicinity of Long Lake, in the Thunder Bay district, south of the Transcontinental.

Don't worry about what people say about you. Think what might happen if they were mind readers.

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. Preparation of methyl alcohol from lignin. EMIL HEUSER and HANS SCHMELZ. Cellulosechemie **1,** no.6, 49-58 (1920). Lignin is a by-product in the hydrolysis of wood to sugar by acids, and it is desirable to obtain means of utilizing it. The authors show that by heating lignin with 5.7 p.c. hydrochloric acid and under 5-6 atmospheres pressure (150-160°C) practically the whole of the CH_3O content of the lignin is split off as methyl alcohol. The yields obtained were acetic acid, 2.19 p.c., acetone 0.73 p.c. and methyl alcohol 14,83 p.c. 5 grams of lignin were heated with 30 cc. 5.7 p.c. hydrochloric acid, 2 hours at 5-6 atmospheres, and the residue again heated 2 hours under the same conditions. Four hours continuous heating gave about 13 p.c. methyl alcohol while heating at atmospheric pressure gave a yield of only 2.56 p.c.—C.J.W.

A-1; B-O. Paper pulp supplies from Chile. J. Royal Soc. Arts **68,** no. 3544, 769-771 (1920). Among the trees, whose wood is suitable for papermaking, are the wild bamboo (coihue or quila), conifers, as the alerce and cypress, and the Chilean pine (Araucaria). There are about 10 million acres of primeval, heavily timbered country covered with these trees. Much of this land is under governmental control and cooperation could be counted upon. Water and water power, ready access to sea transport and good if not plentiful labor are among the advantages; the disadvantage is the heavy rainfall in certain sections.—C.J.W.

A-6; E-2. The composition of sulfite coal (Strehlenert). HANS KRULL. Cellulosechemie **1,** no. 6, 58-59 (1920). Two samples of sulfite coal, prepared according to Strehlenert's directions, gave the following numbers on analysis: moisture, 9.24, 6.34 p.c.; ash, 9.80, 35.45 p.c.; carbon, 54.64, 34.66 p.c.; hydrogen, 4.77, 4.10 p.c.; heating value, 5,424, 4,151; heating value of dry and ash-free product, 6,700, 6,000. These figures correspond to emperical formulas 1, $(C_{16}H_{17}SO_3)_x$; 2, $(C_{11}H_{16}S_2O)_x$; when these are compared with the formula for the sulfonic acid of lignin, $C_{40}H_{44}O_{17}S_2$, it is evident that considerable carbonization of the liquor has taken place.—C.J.W.

B-4. Preparation of alcohol from wood. EMIL HEUSER. Cellulosechemie **1,** no. 5, 41-46 (1920). A lecture, reviewing the present processes.—C.J.W.

D-4. Grinding apparatus for the manufacture of woodpulp. U. S. patent No. 1,342,231, P. C. SCHAANING, Vestre Holmen, near Christiana, Norway. Paper **28,** (July 14, 1920). In a grinding app. for the manuf. of woodpulp, the combination of a grinding stone, a compartment for receiving wooden blocks to be ground, said blocks forming a column to be pressed against the stone, a reciprocable forward-pressing device operating members gripping the faces of the blocks, and a supplying device or hopper for effecting refilling of blocks into said compartment and arranged to feed the blocks in a direction more or less across to the forward-pressing direction into the space behind the blocks of the column gripped by the gripping members and according to the movement of the latter towards the stone, whereby the said space will remain constantly filled with blocks forming an extension of the block column. Claims allowed 24.—A.P.C.

E-2. Method of and the means for the de-acidification if raw wood-pulp liquor. B. GRATZ. English Patent 150,571. Nov. 26, 1919. The liquor is allowed to flow along a trough through which the ashes from lignite or other brown coals are transported in an opposite direction by means of a mechanical conveyor. The cost of neutralization is small, and the liquor obtained may be used for preparing artificial stone. —C.J.W.

E-2. The determination of methyl alcohol in sulphite spirit. EMIL HEUSER and ASCHKENASI. Papierfabrikant **18,** no. 33, 611-615 (1920). The method of Konig is used. 50 grams of potassium bichromate and 50 cc. sulfuric acid in 500 cc. water are heated 1 hour, and cooled 25 cc. of the dilute alcohol (equal to about 3 grains of pure alcohol) are run into a flask which is connected with a carbon dioxide absorption train, and then the cooled chromic acid solution. After standing over night, it is heated to boiling for 1 hour and carbon dioxide free air then passed through for an hour. The weight of CO_2 found, multiplied by 0.728, gives the content of methyl alcohol.—C.J.W.

E-2. Concentration of sulfite and sulfate waste liquors by freezing. Ger. patent No. 316,592, E. OMAN, June 26, 1917. J. Soc. Chem. Ind., **39,** 483A, (July 15, 1920). The liquors are kept agitated and subjected to a temp. below their solidification point, any snow or ice crystals formed being removed by filtration or centrifuging. Portions of liquid adhering to the crystals are dild. The low temp. of the crystals, as well as of the concd. liquors, may be utilized for cooling further quantities of liquor. The concn. of the liquors may be increased to 40 p.c. by this method.

F-2. Process for treating soda-cellulose waste lyes. H. ACHENBACH. German Patent 322,771. Feb. 16, 1919. The waste liquor passes down a tower, in which it is concentrated from about 5°Be (sp. gr. 1.037) to about 10° Be (sp. gr. 1.075) by means of furnace gasses. It can then be evaporated in the usual apparatus without frothing.—C.J.W.

K-6. Preparing cellulose from peat for the manufacture of paper and cardboard. Papierfabrikant **18,** no. 36 and 37, 663-667, 683-689 (1920). A review of practically all the German patents granted for the utilization of peat in the paper industry.—C.J.W.

K-4. Method of manufacturing paper barrels. U. S. patent No. 1,340,110, R. S. BOLGER, New York, N.Y., part Assignor to Geo. F. Whistler, Brooklyn, N. Y., U.S.A. Paper, 26, (July 14, 1920). The method of manufg. bilged barrel bodies of a continuous unbroken web of paper, which consists in longitudinally stretching said web between the side edges thereof, the latter remaining relatively shorter than the stretched portions, then longitudinally wrapping the same upon itself into bilged barrel formation, and interposing relatively narrow strips of flexible materials between the convolutions of the web during the wrapping of the web around the mandrel. Claims allowed 8.—A.P.-C.

K-8. Color solution tank. Paper, **22,** (July 14, 1920). The app. consists of a cylindrical tank with an inlet pipe for hot water which takes on a centrifugal motion on entering. A solid cone is in the center of the bottom to prevent any coloring from lodging there. The soln. remains about 0.51 min. before leaving the tank from the upper outlet when the hot water supply is shut off and the valve opened on the lower outlet to drain the tank completely. Both outlets are joined into 1 T-fitting below which is an 85-mesh sieve to strain the soln. as a final precautionary measure. The T-fitting on the upper outlet is equipped with a nipple for the attachment of a cold water hose to dil. and cool down certain color solns. (basic anilines) in order to prevent a granite effect. The inlet pipe is equipped wth a thermometer in order to regulate the temp. of the hot water, as s necessary in certain cases (auramine). The length of time required for the operation has been reduced 50 p.c.—A.P.-C.

K-11. Paper drier. JOHN E. ALEXANDER. Paper, 29, (July 21, 1920). The invention comprises an inclosed drier unit having electrically heated elements disposed so that the web is dried by being carried upwards by belts of varying wire mesh, between the heating elements, and out of the upper portion of the drying unit.—A.P.-C.

K-11. Paper roll support. U. S. patent No. 1,341,862, E. L. REED, Sterling, Ill., U.S.A. Paper 28, (July 14, 1920). A device comprising a frame provided with a cross-bar; a clip secured to the lower face of the cross-bar and provided with the resilient side-plates; an arm pivoted in said-clip; a spring in engagement in said arm and tending to force it downwardly; and bosses projecting inwardly from said sideplates, adapted to engage the arm and hold it releasably in elevated position. Claim allowed 1.—A.P.-C.

K-10. Process of preparing pulp having wax-impregnated fibers. U. S. patent No. 1,344,620, F. B. DAVIDSON, Assignor to National Biscuit Co., New York, N.Y. U.S.A. Paper, 26, (July 14, 1920). The process of preparing pulp having wax impregnated fibers, consisting in mixing together papers having waxed and unwaxed portions so as to have enough waxed fibers to impregnate with the wax liberated from the waxed portions of the papers substantially all the unwaxed fibers that may be present in the mixt., adding enough water to reach all parts of the mixt., and cooking and agitating the mixt. under steam press. to soften the fibers of the papers and the wax and cause the latter to be forced into the fibers of the papers. Claims allowed 4. — A.P.-C.

K-14. Angle-gage attachment for paper-cutting machines. U. S. patent No. 1,345,033, H. STENGEL, Assignor to A. J. Otten, Los Angeles, Cal., U.S.A. Paper, 24, (July 14, 1920). An angle gage attachment for paper cutting machines having a straight back gage including vertical ribs; the attachment comprising outer attaching blocks having notches adapted to receive the ribs, set screws in the outer attaching blocks to engage the ribs, a central attaching block having a notch to receive a rib, set screws in the central attaching block to engage opp. sides of the rib, angle gage plates pivotally connected to the central attaching block links pivotally connected to the angle gage plates and bearing upon the outer attaching blocks and having longitudinally extending slots, and cap screws inserted through the slots and tapped into the outer attaching blocks; so that by manipulating the cap screws the angle gage plates may be adjusted. Claims allowed 3. — A.P.-C.

K-18. Drying of pasteboard. Paper **24,** (July 14, 1920). HUBERT EICHEN, Grevenbroich, Germany. A patent on drying sheets of pasteboard by having them pass through horizontal drying galleries on endless chains. An innovation is the elimination of stationary partitions, these being supplanted by the cardboard to be dried. It is claimed this reduces building costs materially. The sheets are hung alternately crosswise and length-wise, so that they receive the air currents in alternating directions. It is claimed this accelerates the drying process.—A.P.-C.

K-20. Process for parchment paper and vulcanized fiber. Fr. patent No. 500,504, The Manchester Oxide Co. Ltd., Dec. 18, 1919. Paper, 17, 24, (July 21, 1920). Same as U. S. patent No. 1,333,465. Paper, **26,** 235, (1920).—A.P.-C.

K-11; K-23. Paper machine for the manufacture of narrow strips of paper. Fr. patent No. 505,686, TURK GESSELSCHAFT m.b.H., Germany. Papeterie, **42,** 925-6, (Oct. 25, 1920). Narrow discs are placed side by side, but a small distance apart, and are made to act on the wire of the machine between 2 of the guide rolls so as to produce trough-like depressions in the wire. As the wire travels the fibers are deposited in the spaces between the discs, so that when the wire emerges from under the discs it carries strips of fibers having clean-cut edges and uniform width and thickness.—A.P.-C.

K-14. Paper winding and unwinding. Br. patent No. 144,485, T. LOVE, London. Paper, **27,** No. 6, 30, (Oct. 13, 1920). The paper is supported by spindles and rolled on to a drum. Several successive lengths may be rolled, such as end remaining on printers' reels, that may later be used as posters, bills, etc. The roll on to which the paper is wound has a wire resting in a groove in its periphery. By drawing the wire through the paper, sheets of a given length can be cut according to the adjustment.—A.P.-C.

K-23. Waterproofing and hardening cellulose and its products. Br. patent No. 145, 610-119, F. MOELLER, Cassel, Germany, Sept. 1, 1920. Chem. Met. Eng., **23,** 990, (Nov. 17, 1920). Pure cellulose such as cotton, cellular tissue and papers and cardboards made therefrom are hardened and rendered water-resisting by treatment with thionyl chloride. Indiff. solvents for the thionyl chloride, such as chloroform, carbon tetrachloride, benzene, etc., may be used. A better parchmentizing effect on paper is produced by exposing the paper, after treatment if necessary in vacuum, to the vapors of thionyl chloride. Continued treatment renders paper absolutely impermeable. It is desirable, after treatment, to wash with water or dil. alkali, or to treat with dry NH_3 gas.—A.P.-C.

K-23. Process for rendering cardboard, paper, and paper fabrics grease—and water-proof. Ger. patent No. 316,527, L. BUCHBINDER, March 19, 1919; addition to 306,028. J. Soc. Chem. Ind., **39,** 653A, (Oct. 15, 1920). Cardboard which has been coated with a glue ppt. containing a filling material, in accordance with the chief patent (see J. Soc. Chem.. Ind., **37,** 575A, 1918), and dried, is further coated with a mixt. consisting of a satd. soln. of tannin and resin in spirit and a varnish containing a drier, to which mixt. Zn white and formaldehyde have been added.—A.P.-C.

UNITED STATES NOTES

FOREST CONSERVATION FAVORED AT WASHINGTON.

At hearings held last week before the Committee on Agriculture of the House of Representatives much testimony was adduced in favor of the Snell forestry conservation bill. Through this measure it is proposed to halt reckless forest devastation, substituting scientific cutting and planting and the application of a comprehensive policy of control over woodlands that embodies the best experience of France and Germany. The bill includes also a provision for an annual appropriation of a million dollars to be spent in cooperation with the States in fighting forest fires, and for ten million dollars a year for the purchase of additional forest lands. The bill received vigourous support from numerous forestry experts and other authorities on woodlands. Among those called upon to express their views with regard to the proposed legislation were the following: Philip Ayres, secretary of the New Hampshire Forestry Society; Wm. B. Greeley, Chief Forester of the United States; Alfred Gaskill, State Forester for New Jersey; R. S. Kellogg, of the News Print Service Bureau; E. E. Carter, Assistant U. S. Forester; E. Parsonage, president of the Association of Wood Using Industries; Elbert H. Baker, publisher of the Cleveland "Plain Dealer"; Charles Lathrop Pack, president of the American Forestry Association; Col. Henry S. Graves, former Chief Forester; George W. Sisson, Jr., president of the American Paper and Pulp Association, and E. T. Allen, representing the Western Forestry Conservation Association and the National Lumber Manufacturing Association. Testifying as a lumberman and in behalf of the Pacific Coast timber owners, Mr. Allen's stand in favor of the bill is significant inasmuch as it shows that the lumbermen, who in the past have been perhaps too ready to denounce all plans for forest regulation, have awakened to the serious position in which forest depletion has put their own industry.

Mr. Kellogg's Remarks.

R. S. Kellogg, discussing necessity of inventory of nation's forest resources, before congressional committee in hearing on Snell forest bill, said:—

"We are using 125 pounds of paper per capita yearby in the United States, and our pulp wood supply is rapidly dwindling, but no one knows how much we have, nor where it is the best national economy to produce the future supply, said R. S. Kellogg, representing the American Paper and Pulp Association, the parent organization of the United States paper industry, and also chairman of the National Forestry Program Committee, the coalition of manufacturers, converters and consumers of wood products which is sponsoring the Snell bill.

"We are told that there is no other material on earth so good as hickory for vehicle manufacture, yet we do not know enough about the present supply, the requirements of the industry, nor how to produce a future supply, to enable us to tackle the problem with any assurance of success.

"These are the reasons why we believe that an inventory is the first requisite in this business undertaking. Sound financing and management are impossible without stock taking and inventories must be periodically revised. This is why the provision for a survey of the nation's forest resources is asked by the so-called Snell bill.

"A forest inventory and a census of timber requirements are fundamental to any adequate plan for forest production and utilization. We must find out what we have, where it is, how fast it is growing, how rapidly it is being used, and what we might have if all forest soil were put to work. We don't know where we stand now. We must know if we are to tackle the problem of continuous forest production on an adequate scale and in an intelligent fashion."

President Sisson's Statement.

George W. Sisson, Jr., President of American Paper and Pulp Association, said:—

"The American Paper and Pulp Association, the parent association of the paper industry in the United States, desires to be recorded in favor of the Snell forestry bill, not alone because the paper industry is dependent for its future existence on a continuous supply of raw material from the forests but because this Association believes it best for the nation as a whole," said George W. Sisson, Jr., of Potsdam, N.Y., president of the American Paper and Pulp Association.

"While in the last analysis the problem of the paper supply is the problem of the timber supply, it should be noted that the manufacturing of paper is but one of the many methods of forest utilization and that the total demand for timber for other purposes exceeds many times that for the making of paper, this industry using only about 8 percent of the annual cut of timber.

"The paper industry touches so closely the daily lives of the people and reaches such a condition of indispensibility in our modern life, that we must approach the problem of its raw material supply with a strong consideration for the public interest involved, and with a determination that our efforts in the interest of the public shall be so widely directed that no minor consideration or controversial attitude may interfere with the successful result.

"In this spirit the American Paper and Pulp Association approves the policy now proposed, because it appears to be a fair adjustment of the respective rights of the timberland owner, the manufacturer, the converter and consumer of forest products, which latter is the general public.

"The relation of the paper industry to forestry is being daily realized as more and more vital. With the great sums involved in the paper manufacturing plant investments, the paper industry is willing to do more than its share toward providing a future supply of raw material. But the public must do its part, protect its own forests from losses by fire, and must not impose upon the timberland owner such conditions of taxation and operation that his only salvation is deforestation. All he asks is a chance to reforest. We believe this bill properly apportions the task between federal and state governments and private owner.

"Speaking for the manufacture of pulp and paper,

let me give assurance of our entire readiness to assume obligation and render full measure of service in the practical execution of a program that will be continent wide in its scope, all-embracing as to wood-using industries, and dedicated in its last analysis to the permanent service of all the people."

A Good Investment.

William L. Hall, Chicago, speaking in favor of federal acquisition of forest land, said:—

The United States should lay out for itself the program of acquiring a million acres a year of deforested or cut over lands, and building these lands into its system of national forests. The widening of purchases under the Weeks law should and will be subject to special consideration because of the appropriation involved. Before the war appropriations were made at the rate of $2,000,000 a year for the purchase of lands for national forests at the headquarters of navigable streams. It is proposed now to increase the amount to $10,000,000 a year and remove the restrictions of limiting purchases to the water sheds of navigable streams.

No matter what plan of forestry may be adopted, Government-owned forests must be the nub of the plan. It is to them that the nation must look for the best development of forestry. They are the centers of fire protection and the centers of influence in the better handling of private timberlands in the regions around them. They must be located in all timber regions. The National Forests of the west, with all their barren, inaccessible and burnt over areas, have now become self-supporting. The National Forests in the East, purchased at a cost of over $11,000,000, are now worth more than double that amount. They are good investments.

The moment the true nature of the reforestation problem is understood it is clearly seen that it would be most unwise to try to put it off. Delay increases the cost out of all proportion to the time involved. Especially is this true in acquiring lands. In 1900, when the question of acquiring forest lands in the Appalachians was first agitated virgin timberlands could have been bought at the price paid today for cutover lands. In 1911 when the Weeks law was passed the opportunity was not as great as ten years before, but it was better then than it is today. It is better today than it will ever be again. We must start on this program at once or the costs become simply appalling.

It has been reported to congress that in the United States are 81 million acres of lands formerly timbered and still capable of producing good timber, but now barren and to remain in desert-like condition until they are replanted to trees. The cost of allowing such lands to accumulate is tremendous. Assuming no cost for the land, and considering only the cost of planting trees and protecting the planted trees from fire, their cost will be not less than $40 at the end of thirty years.

Walter E. Trum of E. J. Trum, Inc., Brooklyn, was elected president of the Metropolitan Paper Box Manufacturers Association at the recent meeting of that organization held in the Hotel McAlpin, New York City. Other officers chosen were William H. Casselman of T. & E. Casselman, Inc., New York, vice-president and Robert M. Zoller of Schenck & Schlichte, Inc., New York and Newark, treasurer.

A resolution calling for an investigation by the Federal Trade Commission of print paper supplies and prices was introduced in the Senate last week by Senator Harris of Georgia. The Senator, who was a member of the commission when it investigated the news print industry in 1918, asserts that there is no real shortage of print paper at present. He claims also that white paper is being offered in the open market at a lower price than that covered by contracts with the big companies who usually control the situation, and that despite this the newspapers are forced to make contracts for 1921 with the right of the paper company to fix its own prices subject to quarterly readjustment.

A layoff affecting 100 employees in the offices of the American Writing Paper Company went into effect beginning February 1. The foremen employed in the company's plants have been transferred from a salary to an hourly wage basis.

The United Paperboard Company reports net earnings for the six months ended Nov. 27, 1920, of $1,002,985 before depreciation and income taxes, as compared with $165,807 in the corresponding period of 1919.

Six of the twelve paper mills in the Kalamazoo district have put into effect wage reductions approximating 17 per cent.

Herbert Hoover, former United States Food Administrator, and Julius Barnes, former head of the Grain Administration, have formed a holding company to take in several industrial enterprises in which they are jointly interested. The new company, to be known as the Intercontinental Development Company, will control the Washington "Herald", a large block of the stock of which is controlled by Mr. Hoover. It will control also the Pejepscot Paper Company of Pejepscot, Me., and the Clearflax Rug Company of Duluth. The former has important holdings in Maine and Canada. It is trying to reforest lands as they are cleared and to use water power on its properties.

Newspapers now printed in black and white may have to appear in colors unless the several States that furnish black ink withdraw legislation designed to bar the use of natural gas in the manufacture of carbon black, the pigment used as a basis for printing inks. Wyoming, Louisiana and West Virginia, the three States now turning out the world's main supply of carbon black, are considering measures prohibiting the transformation of natural gas into carbon products and conserving it for domestic use.

L. L. Alsted of Milwaukee and A. J. McKay of Appleton, Wis. have been granted a charter in Wisconsin for a new concern to be known as the Valley Pulp Company. They have just completed a deal for the big paper plant of the Kaukauna Pulp Company at Kaukauna. Several weeks ago they purchased the Lakeside Paper Company's mill at Neenah. Both these plants will be operated for the Valley Pulp Company. Improvements are being planned in each mill with a view to effecting a material increase in their output.

Ironsides Board Corporation, Norwick, Conn., is now entirely owned by the Shuttleworth-Keiller Co., of New York. The firm has purchased all of the stock of the company formerly owned by the American Straw Board Company and Mr. A. G. McIntyre. Mr. McIntyre devotes his whole attention now to the management of the Bear River (N.S.) Pulp & Paper Co.

PULP AND PAPER NEWS

The Ontario Government will, in the near future, advertise two rather extensive timber limits in Northern Ontario as being for sale. One is tributary to the Nagagami River in Algoma, and the other near Long Lake in the Thunder Bay district. Both will be sold subject to conditions regarding the establishment of pulp and paper mills. Water power concessions go with both. The first limit mentioned will have the electrical development north of the transcontinental railway available for paper manufacture. The other limit is south of this railway. Both are west of Hearst, and both are now being cruised for the Government.

Word from Port Arthur is to the effect that the Kaministiquia Pulp and Paper Company's new mill in that town went into complete operation on Jan. 24th. The slasher mill has been running for a couple of months and has prepared 1,500 cords of pulp wood for the grinder mill and the wet room, which latter has also been started. The company has its output sold for six months ahead. Plans are under way for increasing the present capacity of 80 tons per day to 100.

The Digby Weekly Courier of Jan. 7th just to hand contains an interesting write-up concerning the possibilities of the development in Nova Scotia of the pulp and paper industry which was inspired by the fact that Messrs. Clarke Brothers new mill at Victoria Bridge is rapidly nearing completion and will be in operation in a few weeks. It is pointed out that while paper has been made in Canada for more than 100 years, the second paper mill in Canada was built in Nova Scotia, at Bedford Basin, in 1818, by R. A. Holland, who at that time was the publisher of the Halifax Record. So late as 1881 the census showed Canada at that time to have had only five pulp mills, with an invested capital of $92,000, employing 68 people and having an annual output of valued at $63,000. Ten years later 24 mills were operating with a capital investment of $2,900,907, employing 1,025 people and with an annual output valued at $1,057,810. Today there are $260,000,000 invested in pulp and paper mills in Canada.

The death took place at Oshawa, Ont., on Jan. 24th, of Edward Mundy, president of the Reformer Printing & Publishing Company, a pioneer newspaper man of Ontario County, who had reached the advanced age of 84 years. Deceased served his apprenticeship with the Toronto Globe and in his young days he worked on several of the Toronto papers and at one time ran a paper at Prince Albert, Ont. He went to Oshawa 32 years ago and in 1910 he retired from the editorship of the Ontario Reformer which he had purchased in 1878.

Hon. G. Howard Ferguson, in the Ontario Legislature, has moved that a return be made to the House of all correspondence between the Minister of Lands and Forests, the Prime Minister or any member of the Government and E. W. Backus, or any other company, firm or person, together with all estimates, reports, advertisements, conditions of sale, tenders, agreements, maps, documents and papers of every kind relating to the Lake of the Woods pulp concessions, the White Dog Rapids water power or any other water power in the district of Kenora, and the recent sale of pulpwood and timber on the English River concession.

Mr. Fred Ratcliff, of the Ratcliff Paper Company, and Mrs. Ratcliff, leave next month on a combined business and pleasure trip to Bermuda.

Among the outside paper men in Toronto this week were Mr. P. B. Wilson, Vice-President of the Spanish River Pulp and Paper Mills, Limited, and the new President of the Canadian Pulp and Paper Association; Mr. R. I. Worrel, head of the pulp sales department of the George H. Mead Co., Dayton, Ohio, and Mr. E. H. Macklin of the Manitoba Free Press.

Mr. Robson Black, secretary of the Canadian Forestry Association, delivered an interesting address before the Kiwanis Club at the King Edward Hotel in Toronto last week on "Canada's Timber Wealth."

The Toronto Board of Trade was addressed on Jan. 26th by Hon. Beniah Bowman, Minister of Lands and Forests, on "Ontario's Forests."

The Hinde & Dauch Paper Co. of Canada, who have a large plant in Toronto, have increased their capital stock from $250,000 to $625,000.

The Howell Lithographing Company, Toronto, has increased its capital stock from $49,000 to $500,000.

A charter has been granted to the Nelson Press, Limited, Toronto, with a capital stock of $100,000 and headquarters in Toronto and with power to carry on the business of printers, publishers and manufacturers of wall paper, envelopes, etc.

Messrs. Ritchie and Ramsey have resumed operations at their paper coating mill at New Toronto after installing a new overhead hot air drying system and building what is practically a new color house, as well as carrying out other renovations.

Hon. Beniah Bowman stated in Toronto last week that a bill would be introduced in the Ontario Legislature at the present session making it possible for the department to carry on an extensive scheme of reforestation and making it possible for individuals, municipalities or corporations to reforest. The scheme will apply to the whole province.

The death took place in Toronto last week of Mr. Louis V. Bouvier, father of Mr. L. P. Bouvier, of Bouvier & Hutchinson, envelope manufacturers, Toronto. Deceased was one of the oldest men in Ontario, having reached the age of 102 years.

Canadian S. K. F. Co., Toronto, has issued an interesting bulletin showing how ball bearings are applied to pulp grinders and Jordan engines. The former use involves the problem of keeping water from the bearing and the latter has to provide for a heavy thrust.

The Miramichi Lumber Company is the largest operator in their section, but is confining its efforts chiefly to pulpwood. The Partington Company is also getting out a large quantity of pulpwood this season.

The Markets

CANADIAN TRADE CONDITIONS

Toronto, Jan. 29.—Business in pulp and paper circles is unsettled and of rather small volume and while manufacturers and jobbers are convinced that the next month or two will see a change for the better, there is undoubtedly at present a depression in the trade such as is being experienced in other commodities of constant consumption. Here and there one hears reports of improved business conditions but they are not very general. The concensus of opinion in the paper trade is that manufacturers and jobbers will have to be content to take considerable losses for a time and that they will have to reconcile themselves to small orders at reduced prices. This condition has been prevailing for some weeks, and, according to several paper men interviewed this week, there is no immediate prospect of a betterment of the situation. In one or two instances it was reported that buying had shown signs of resuming, but on a small scale. During the past week there has been very little reduction of the big stocks of paper on hand in the Toronto warehouses, although salesmen are out, as in the old days before the boom, trying to place orders, but printers are not stocking paper and are only buying from hand to mouth. They report a lull in advertising output and will not stock up beyond their immediate requirements. Then, too, there is the falling market to contend against which is a bg factor in the decreased volume of business being done at the present time. Book, ledger and bond paper manufacturers and the jobbers are still conferring in an endeavor to get at a stabilized price-list and this branch of the trade is still in a very unsettled condition. In the meantime some lines of fine papers the jobbers used to pay twenty cents and more for can now be obtained for seventeen cents and less.

IMPORTS.—Sales representatives of American importing houses report that very little paper is being imported into Canada. There were considerable imports of board until the recent reduction in price by the Canadian mills and the same holds good of bonds and ledgers. There are a few lines of paper not made in Canada that are coming in but the consignments are very small.

MAY BE CURTAILED PRODUCTION—In pulp and paper circles there is considerable speculation as to whether or not the plans made for a big increase in pulp production this year will materialize. During the old year many new companies were organized for the manufacture of pulp and paper and quite a number of the old companies have enlarged their plants and have announced further expansion as being likely. But there have been falling prices in both pulp and paper lately and in consequence the opinion prevails in some quarters that not only will some of the operating companies fail to put their expansion plans into effect but that some of the new companies have failed to receive the necessary support which would warrant them in going ahead. It is generally believed, however, that whatever abandonment of plans has taken place, it is only of a temporary character and that expansion in accordance with the original program will be gone on with as soon as the present lull in business is over. The opinion seems to prevail that the present year will not see the big increased production promised last year.

MANILAS DOWN.—In addition to the reduction of "B"manila to 9c and No. 1 to 11c. announced last week, a reduction of approximately ten per cent in manila bags came into effect this week. The discounts on manila bags are now 50, 10 and 5 per cent. Kraft discounts are now 60, 2½ and 5 per cent and on white bags 45 and 5 per cent. The wrapping paper trade is keeping up fairly well although the orders are coming in are of rather small dimensions.

PULP.—The market for pulp is still dull. There are no stable quotations and enquiries there are mostly feelers to find out just how the market lies. Some of the mills which made pulp at a high cost last year are said to be holding their product for a rise in the market. However that may be there is very little moving and what sales are being made are at reduced prices. The outlook, however, is bright for a stiffer market. It developed at the boot and shoe convention in Toronto this week that the trade is due for big development, which will mean more boxes and consequently more pulp. Ladies wear and other lines requiring boxes are in for a boom which will naturally affect the box board and pulp industries. Groundwood pulp can be bought now anywhere from $75.00 to $90.00 per ton, while bleached sulphite is quoted at from $130 to $140. Unbleached sulphite rules at about $100.

LIGHT WEIGHT PAPERS. — Manufacturers of tissues and toilets report a better demand than is characterizing most lines of paper. They say that trade is gradually picking up and buying is considerably freer than at any time since the slump set in. There was a reduction in toilets this week representing five per cent. Tissues remain unchanged.

RAG AND PAPER STOCKS. — There has been a notable increase in enquiries from paper mills for new cotton cuttings, but, according to local dealers, this is where the improvement ends, as only a small amount of actual business has been done. Paper manufacturers are sounding the market to detect soft spots, and are buying only where sacrifice prices are obtainable. Dealers are of the opinion that while some lots of cuttings may be bought under the present levels, most of the grades, as a general rule, are held for full price where any quantity is considered. The prices on cuttings have been unchanged since last quotations. Old cotton rags have shown no improvement, the market being still nominal. The larger dealers report business absolutely at a standstill, but they are in hopes that Spring will bring a renewal of business in this line. Contrary to previous predictions No. 1 mixed papers seem to have strengthened considerably. Good packing has advanced from $3.00 to $4.00 per ton, while there is yet very little business for large tonnages, yet dealers feel that a ray of light has been cast on the waste paper situation. The general firmness with which wood pulp prices have been holding the past few weeks has been the chief factor leading to

the belief that waste paper prices are too low, and as soon as mills begin to use normal quantities, a sharp advance will be noted in prices. Books and ledgers are unchanged in price with demand in the same proportion as last week. Kraft is slightly weaker, following up a downward trend in American prices. White blanks have also eased off a little, which has lowered the price of manila cuttings.

	Per Cwt. F.O.B. Toronto
No. 1 shirt cuttings	$18.00—$19.00
No. 1 unbleached cotton cuttings	11.50— 12.00
No. 1 fancy shirt cuttings	9.00— 9.50
No. 1 blue overall cuttings	8.00— 9.00
Bleached shoe clip	11.00— 12.00
White cotton hosiery cuttings	14.00— 15.00
Light colored hosiery cuttings	11.00— 12.50
New light flanellette cuttings	11.50— 12.00
No. 2 white shirt cuttings	8.50— 9.00
City thirds and blues (repacked)	1.90— 2.00
Flocks and satinettes	.80— .90
Tailor rags	.60— .70
Gunny bagging	1.10— 1.20
Manila rope	3.75— 4.00
No. 1 white envelope cuttings	6.75— 7.00
No. 1. soft white shavings	6.00— 6.50
White blanks	2.25— 2.50
Heavy ledger stock	3.50— 3.75
No. 1 magazine	1.90— 2.00
No. 1 book stock	1.75— 1.80
No. 1 manila cuttings	2.25— 2.50
No. 1 print manila	.75— 1.00
Folded news	.75— .80
Over issue, news	1.30— 1.40
Kraft	2.25— 2.75
No. 1 clean and mixed papers	.50— .60

NEW YORK MARKETS.

New York, January, 29.—(Special Correspondence.)—Trade activity in paper continues narrow in scope. Consumers have not altered their buying policy as yet and are absorbing merely such quantities of paper as are directly required, with the result that aside from the contract movement of supplies very little paper is being shipped by mills to consuming centres. There is business passing, of course, but the total volume of buying at present is so far below normal that current market transactions have practically no influence on values.

The situation is at best a very irregular one. Most manufacturers are not pressing customers to buy, doubtless figuring that action on their part in this direction would only serve to make buyers hold off to a greater degree than they are. Moreover, there is a feeling of confidence among paper producers that demand is not likely to remain dormant for long. Plenty of signs are visible of a revival of industry in many lines on which the paper trade largely depends. As would be expected in a market such as now exists, there are some paper manufacturers who are cutting prices in an effort to underbid competitors and obtain business. This is not a common practice with the trade at large, but the fact remains that some are indulging in such tactics, with the consequence that prices are surrounded by uncertainty.

Changes that have developed in quotations during the present week have been, with rare exceptions, in a downward direction. No sharp recessions have occurred yet there have been transactions recorded at lower levels, and obviously buyers are seeking out supplies which can be secured at concessions.

Reliable information is to the effect that spot newsprint is selling at a further reduction. Business has been reported in standard rolls for prompt delivery at 6.50 cents a pound at mills, and there has been some talk in the trade of sales down to 6.25 cents. It appears doubtful, however, that any worthwhile tonnage can be bought at these figures. The recognized market level is still 7 cents and the probabilities are publishers must pay close to this figure to obtain sizable shipments. It is becoming more and more apparent that there is quite a supply of imported newsprint in this market that remains unsold and it would seem that owners of these stocks are granting sharp concessions in price in their efforts to find buyers.

Another branch of the market which has eased off slightly is book paper. Actual sales of machine-finished book have been recorded at 10.50 cents per pound f.o.b. mill. It is stated that Eastern manufacturers are holding out for at least 11 cents, and that this price constitutes the market basis, but some mills in the Middle West are known to have accepted orders for at least a limited tonnage at 10.50 cents. Super book has sold at 12.50 cents at mills, although a more representative price on this grade is also a half cent higher. A majority of book mills have enough contract business on file to keep them engaged most of the time but in an effort to secure additional orders so as to enable them to run full time, some are shading quotations in getting business away from other manufacturers.

There is little change in the fine paper situation. Quotations are fairly well maintained and a moderate movement toward consuming centres is reported. Wrappings and tissues are quiet but are holding in price, with the exception of No. 1 domestic kraft wrapping which has sold down to 9 cents a pound at mills this week, denoting a slight decline.

Demand for chip board appears to be gradually expanding notwithstanding that buyers are following a very cautious course, and mills are reported securing a fair number of orders. Prices on plain chip range around $50 per ton f.o.b. mills, while news board is quoted at $55 to $60.

GROUND WOOD.—The mechanical wood pulp market is in a quiet position and prices show a softening tendency which is rather unusual for this season of the year when ordinarily consumers are buying freely and when prices trend upward because of the reduced operations of grinders. The present situation is due to the lack of demand. Board manufacturers are buying in sparse amounts, and other transient buyers are mostly out of the market, so that sellers in frequent cases are cutting prices in an effort to stimulate demand. Around $80 a ton at grinding plants is the approximate market values of No. 1 domestic ground wood, and yet there are offerings at intervals considerably under this figure, down to as low as $60 having been talked of in some quarters. It is doubtful whether any tonnage of consequence can be obtained under $80 but it is true small lots are selling for less. Importers are quoting between $80 and $85 a ton ex the dock and assert that their offers are meeting with a comparatively good response from consumers.

CHEMICAL PULP.—There is little important life to the chemical wood pulp trade. Papermakers are coming into view as buyers only spasmodically and even then they are absorbing but light amounts of



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INQUIRIES SOLICITED

pulp, and while a majority of producers and importers are sitting tight waiting for demand to revive, some are offering supplies at sharp recessions from the prices recognized as approximate market levels. It is indeed difficult to get a definite line on values under prevailing conditions. Owners of stocks are mostly themselves at a loss what to say constitutes prices, and so few bids are being registered on round quantities of any grade of pulp that it is largely a matter of guesswork to say what prices are.

Domestic bleached sulphite is available in at least some quarters at 7.50 cents a pound, and probably for less, while domestic easy bleaching sulphite is offered at 6.50 cents, news grade sulphite at 5 cents and domestic kraft down to 4.75 cents. There is relatively a firmer tone to quotations on foreign pulp, due to importers' contentions that the high cost of replacement in Scandinavia prevents them from lowering prices. Imported bleached sulphite is quoted at 8.50 to 9 cents per pound ex dock, unbleached sulphite of No. 1 grade at around 6.50 cents, easy bleaching at 7 cents and kraft at 5.25 to 5.50 cents.

RAGS.—Papermaking rags are sought by mills in most instances only in limited-sized lots and there is little feature to the market. Still there is a fairly steady tone to prices. Dealers and packers are confident in their belief that values have about touched bottom for a time and that prices will rise as soon as consumers show more buying interest, and the average owner of rag stock is holding off awaiting developments. Probably the most actively sought grade of material this week has been roofing rags, and felt mills have bought merely in quantities ranging from a single carload up to five cars, and have apparently secured all the supply wanted at around a cent per pound at shipping points for No. 1 packing of roofing rags. Old whites are quotably firm at about 7 cents for No. 1 miscellaneous packing and between 8 and 9 cents for repacked whites of No. 1 quality. New white shirt cuttings, on the other hand, are lower, with offerings noted at 17 cents per pound at shipping points. New cuttings in general appear to be slipping in price despite the efforts of numerous dealers to hold the market up.

PAPER STOCK.—A quieter situation has prevailed in waste paper this week than during the first several weeks of the new year. Box board mills in the districts adjacent to New York, which for a time were fairly active buyers of low grades of stock, have mostly discontinued buying, and the movement of supplies therefore has slowed up somewhat. No broad fluctuations in prices have occurred. No. 1 mixed papers are selling at around 50 cents per hundred pounds f.o.b. New York, flat folded newspapers at 65 cents a hundred, white blank news cuttings at 2.75 cents a pound, No. 1 heavy book stock at 1.50 cents, old No. 1 kraft paper at 2.25 cents and ledgers and writings at 2.75 cents. A little better demand has prevailed for shavings and No. 1 hard white shavings bought 4.75 cents at New York and soft white of No. 1 quality 3.75 cents.

OLD ROPE AND BAGGING.—Old rope and bagging are little wanted by paper mills and prices display an easy trend. No. 1 domestic manila rope is freely offered by dealers at around 4 cents per pound at shipping points and No. 1 scrap bagging at 1.75 cents, and purchases could doubtless be effected at lower prices.

AMERICAN PAPERMAKERS PLANNING CONVENTION.

One of the biggest conventions ever held in the history of the paper industry is scheduled for April, according to a preliminary program just issued by Dr. Hugh P. Baker, Secretary-Treasurer of the American Paper and Pulp Association, particularly in the number of assications which will hold their convention at this time.

The plans for the meetings of the parent organization are particularly elaborate, and involve some notable speakers on general economic subjects, if present negotiations are successful.

The tentative program follows:

Monday, April 11—	
Toilet Paper Converters Association....	10.00 A.M.
Tissue Paper Manufacturers Association	2.00 P.M.
Paper Makers Advertising Club.....	1.00 P.M.
Tuesday, April 12—	
Book Paper Manufacturers Association..	10.00 A.M.
Cover Paper Manufacturers Association..	2.30 P.M.
Pulp Manufacturers Association..	2.30 P.M.
Salesmen's Association of the Paper Industry	10.00 A.M.
Wednesday, April 13—	
Writing Paper Manufacturers Association	10.00 A.M.
Sulphite Bond Division	2.30 P.M.
Cardboard Manufacturers Association ..	10.00 A.M.
Wrapping Paper Manufacturers Association	10.30 A.M.
Thursday, April 14—	
American Paper and Pulp Association ..	10.00 A.M.
Binders Board Association	4.00 P.M.

All of the sessions will be held at the Waldorf-Astoria.

The program of the Technical Association of the Pulp and Paper Industry is set forth in another article.

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News From Our Advertisers

THE HARDY STOCK REGULATOR.

A number of stock regulators for paper machines have been invented or developed during the last few years. The one here described was devised and tried out in a Canadian mill and is manufactured by a Canadian firm.

The top of the regulator is a square box made to be bolted to one side of the stuff box. A notch is cut on this side of the box, the size of the entrance of the regulator so that the paste, rising to the proper level, enters the regulator. Continuing, the square box turns into a round pipe which takes a slope direction to the floor to then describe a curve and finish by a flange when the stuff can rise vertically. A tank is bolted to the flange of the pipe, said tank starting immediately to open as a funnel until the diameter is a little greater than that of the pipe ,and then it finishes as a kettle. When the paste flows through the regulator it falls from the box in the pipe, emerges in the tank and raises until it overflows in an outer tank which has an exit.

The mechanism is very simple; a float, levers and one gate. The float of cylindric form has a sharp point down. It is held tight in the centre of the inner tank, but is allowed an up and down motion; it works the levers and closes or opens the gates in the square box at the top. Placed right in the centre of the tank, it is a kind of obstruction to the free-flowing of the paste when emerging from the pipe to enter the inner tank and rise. The paste strikes the point of the float and slides along and all around to make its way until it



spreads overboard. It is easily understood that thick stuff being more dense and having a greater consistency than the thin paste, works its way out harder, pushes up the float, which balances the levers so that they close the gate in the head and retain the flow. On the contrary, say, in thin stuff, the float which tested to a certain weight to be heavier than the thin paste, sinks down, draws back the levers, thus opening the gates which release the flow.

Since the action of the float must be absolutely free and extended to any degree of consistency of the stock, the gate must be delicately controlled. We have seen that the gate closes and restrains the flow when the float rises in thick stock, thit it opens and releases the stock if the float sinks down in thin stuff but there must be an opening and closing to allow a constant percentage of "solids" to be ejected at all times in any grade of consistency. This adjustment is made on the levers which convey the motion of the float to the gate.

Levers are disposed horizontally. The lower lever is in balance on the arm bracket, one end of which is attacher to the rod of the float, the other end bears a connecting link attached to the upper lever and this ling is moveable on both levers by means of a screw. It is the position given to the connecting link on the levers that determines the play of the gate in relation with that of the float. When the link is pushed back in the direction of the float, near the center of the lower lever, the action of the float on the gate is reduced to the minimum. On the contrary, if the link carried to the extremity of the lower lever it increases the action of the gate. To locate the right place where this connection of levers must be made to insure a constant percentage of fibre in any grade of density, is the very important point in the Hardy Regulator. Once determined, and this is usually made at the installation, the screws that move the connection on both levers may be locked so that it remains always in correct position.

The upper lever at the opposite end of its connection with the lower lever, is attached to the head of the regulator and pivots on this end; the hinges of the gate are on the same axis but with an inclined position and independent on the axis as to its motion. However, as the motion of the float acts on levers and the levers on the gate, this latter is connected by a rod which is threaded in the upper lever so that an adjustment of the gate without changing the position of the float and levers the rod can be made only by the turning to right or left to give more opening or reduce it. This rod for the control of the gate is placed for correction of tonnage or gauge when necessary, but the Hardy Regulator being built as an automatic outfit to make an uniform sheet, it requires not to be touched or manipulated when properly settled.

Although a novelty on the market, the inventor has demonstrated this regulator for more than two years and it is after many improvements made to meet with all the requirements of the regulation, that it has been launched on the market for the benefit of the paper industry. Some of these regulators have been running with the greatest of success for nearly two years. Within this space of time the regulator has been the object of the inventor's observations and of the paper mill owners who use it, and it has proved that besides the perfect regulation of the sheet of paper or felt, better drying follows as a logical result of the use of Hardy Regulator. Of course, the steam regulation is now rendered very easy. The uniformity of thickness of the sheet on the dryers requires a regular pressure of the steam and there is uniformity of the drying, thus greatly improving the quality of the stock.

It has also been observed that a paper machine fed by this regulator develops a greater capacity of production which is a logical consequence of both regularity of the sheet and the drying. All these conclusions are worthy of the best attention of paper mill owners, for the Hardy Regulator is a saver of labor, a greater producer, a maker of quality, a breaker of records and annuller of claims.

Announcement has been made of the appointment of Mr. G. F. Morris to the position of Sales Manager of the TIME RECORDER DIVISION of the International Business Machines Company, Limited, Toronto. Mr. Morris' connection with the Company has extended over a period of ten years, and he has been an active

member of the organization in almost every capacity, beginning as an apprentice machinist when the International Time Recorders were first manufactured in Canada. The sale of International Time Recording devices has been increased rapidly within the last five years principally because of the general recognition of the necessity for the employment by business executives of accurate Time and Job Cost Records.

THE MANAGEMENT ENGINEERING AND DEVELOPMENT COMPANY.

We are glad to introduce as a new advertiser in the Pulp and Paper Magazine this week (see page 24) a firm already well-known to the industry through their work. The Management Engineering and Development Co. of Dayton, Ohio, is no longer simply the engineering department of a great paper making concern but is now doing a big work in the design, construction and development of pulp and paper manufacturing enterprises.



MR. HOWARD S. TAYLOR.

Mr. H. S. Taylor, chief engineer, needs no introduction to our readers. An article by him on Gypsum Roofs appeared in the Magazine for July 8, 1920 and in an early issue there will be as good an article on Ventilation of Machine Rooms. Mr. Taylor was with Geo. F. Hardy and lately chief engineer for the Spanish River Pulp & Paper Mills, Ltd.

MacRAE'S BLUE BOOK.

The Pulp and Paper Magazine has already found several occasions to make good use of the excellent index to American manufacturers issued by MacRae's Blue Book Co., Railway Exchange, Chicago. Ten dollars is a small fee for the service rendered by these pages.

The indexing of material and equipment in MacRea's Blue Book is done by The Noun, with but few exceptions. For example:

Water Coolers are indexed Coolers, Water; Fire Hydrants as Hydrants, Fire, etc. This saves endless confusion and duplication and makes it possible to insert in the book all needful classifications and still retain its convenient size.

The Address Section gives an alphabetical list of all the principal manufacturers of iron and steel products, building materials, etc., in the United States, and also shows the location of their branch offices and representatives.

The Classified Material Section, wherein are listed, under 20,000 classifications, the names of the various manufacturers of iron and steel products, building construction materials, railway supplies, etc., is arranged so you can get the information you desire very easily, and in thousands of cases it contains a message from the manufacturer.

The blank lines beneath every classification in the Classified Material Section are used by many buyers as an index to their requisitions, it being necessary only to insert on these lines the date and number of a requisition, or order, to have an index of purchases made throughout the year.

The Trade Name Index gives the names of the manufacturers of many thousands of trade-named articles. In the index cabinet at the company's Chicago office, are indexed 200,000 additional registered and non-registered trade names, and, should MacRae's Blue Book fail to disclose a trade name desired, an inquiry will have prompt attention, gratis.

The Miscellaneous Data Section will save much time and worry. It is comprised of odds and ends of information taken from a thousand sources and all indexed in such shape as to make the information readily accessible.

The section giving the Standard List Prices of building materials, iron and steel products, etc., is at once complete and unique, being the only collection of these list prices published. The Net Discount Computer is a handy supplement to this section.

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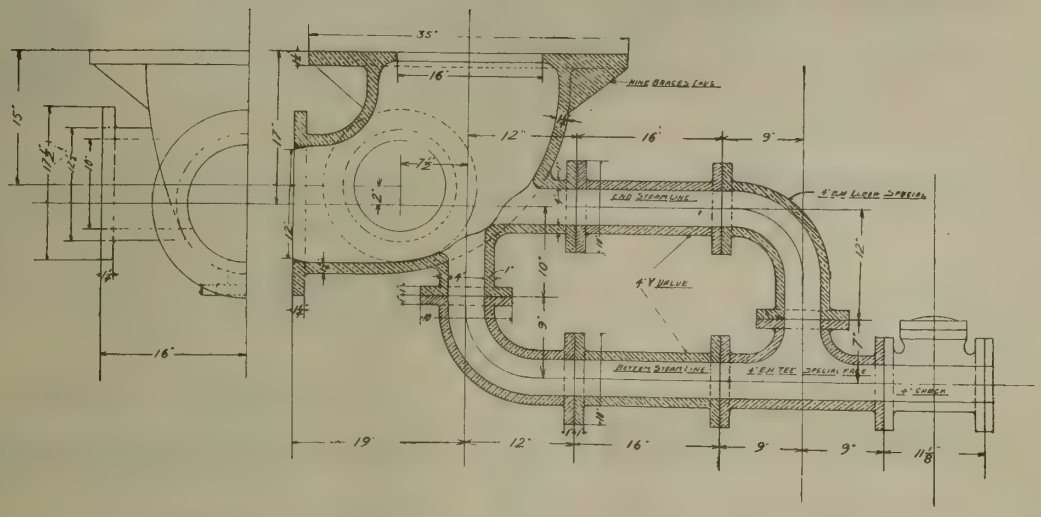
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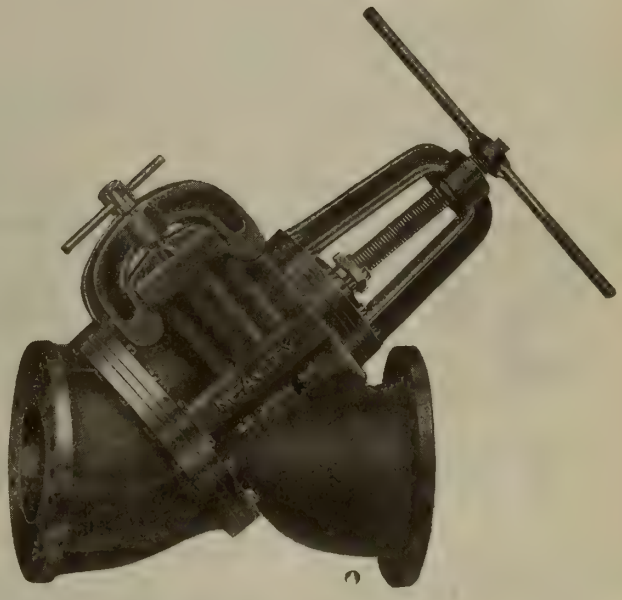
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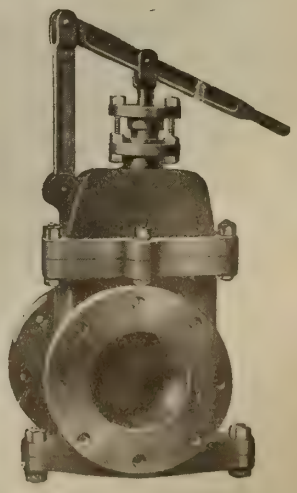
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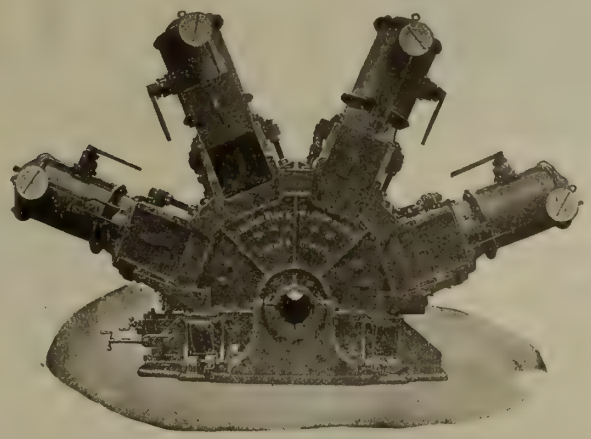
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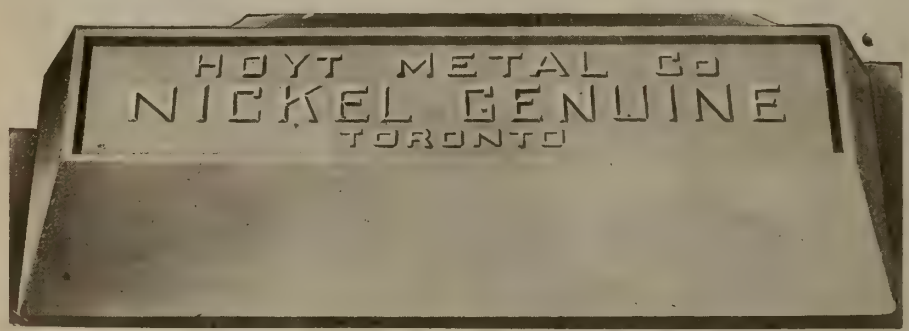
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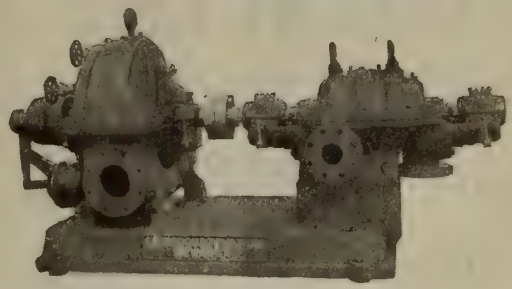
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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., February 10th, 1921. No. 6

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal,
'Phone Uptown 7773

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

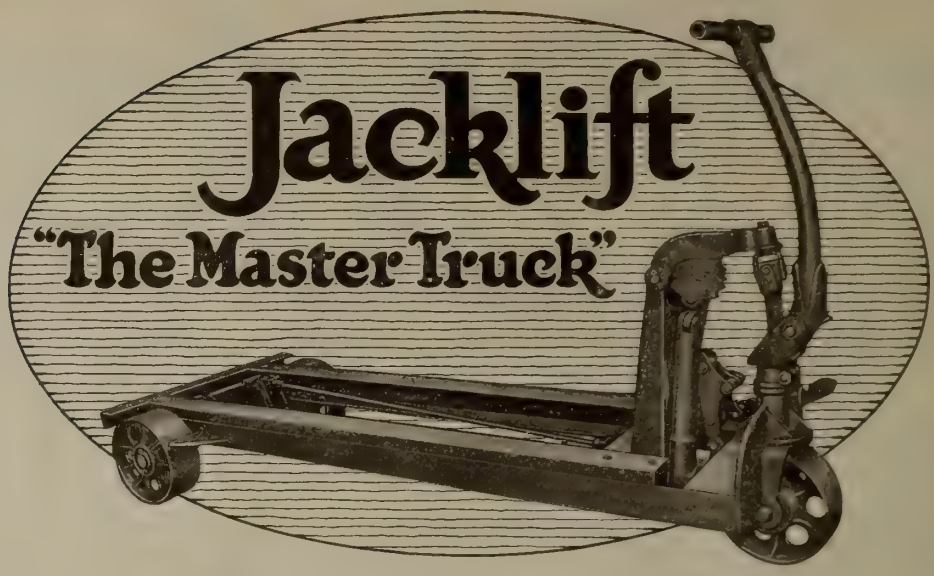
Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

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EDITORIAL

PAPER PRICES.

The prices of most commodities have been downward during the past few months. This tendency has not very generally included papers until quite recently. Winter is always a bad time for extensive building less demand for paper boxes and wrapping papers. Winter is always a bad time for textensive building and the combination of weather and general depression has had its effect on builder's paper and boards. Without the usual amount of business, writing papers have become affected and many concerns have reduced advertising to such an extent that papers used in printing magazines are available in larger quantities and prices are reduced somewhat in consequence. The falling off in advertising demand is also reflected in the newsprint industry, where the high spot market has disappeared and in its place we find a healthy situation where consumers are contracting for their needs and keeping within their contracts.

It is very gratifying that the pulp and paper industry has been so well engaged that the necessity of decreasing prices and curtailing production has been so long deferred. Everyone knew that no single industry could withstand permanently the downward pressure due to general deflation. This has come about in the paper industry in a remarkably easy manner and so far without any serious hardship on those employed in the mills. Most concerns had not been able to give their plants a complete overhauling for some time, and some of them are making extensions, so the employees are kept fairly busy.

Some other industries reduced prices to stimulate buying and some of them found the result very disappointing because the public got the idea that the first reduction meant a series of drops and held off even more than before in making purchases. The paper men realized that there was just about so much business to go around and cutting prices might simply be cutting their own or one another's throats. There has gradually developed, however, a situation that is partly psychological. The lack of orders for paper has reflected on the pulp mills and even back to the wood market — raw materials in general are slightly less expensive; in fact, it seems that most items except transportation and labor have decreased enough to affect the situation. It is thus possible now for paper mills to reduce prices in harmony with other factors.

Buying has been resumed on a hopeful scale in a number of lines, which indicates that the public is at last convinced that the prices which have been reduced are on rock bottom. It seems likely that a fairly stable price condition has come about and that business is again in equilibrium. Occasional concessions may always be expected from people with an excess of goods, but from what we can gather, there are not many such individuals in the pulp and paper industry. Stocks in most lines did not get a chance to accumulate during the past few years so that a resumption of activity should find most mills ready to make orders profitably on the new basis.

COUNTING THE TREES.

One of the most hopeful signs with regard to the forestry situation is that everybody is talking about it. It is necessary to relieve a certain amount of gas in the digestion of wood and the same may be true in the discussing of the subject of conservation of our forests. Not only are newspapers and magazines aroused to a knowledge of the fact that they are dependent for their lives on a continuously productive forest, but other wood using industries are also realizing their present precarious position with regard to future supplies of their raw material. The trouble has been that the lumber industry took no heed of the matter, and in a sense, did not need to, because it was easy to dismantle a saw mill, move it to a new location and butcher another batch of timber — perhaps even burning what was not cut. It was comparatively easy, too, to locate another place to set up the mill. But now there are thousands of mills threatened with extinction because there are no more unsold timber areas to be had. Operators "guessed" they could get along. They "thought" there was timber enough and they could waste as they wished. The idea of a permanent location with a perpetual wood supply was as strange to them as the idea of barn-yard and garden would be to a Bedouin.

And the pulp makers were like unto them. These concerns succeeded several times in getting new leases to cut after others had been stripped. They were able to purchase a lot of wood from farmers. The supply seemed inexhaustible. But the paths of those who were mining the forest converged and when one began to hear the sound of the others axes it became painfully evident that there could not be as much timber as each had thought. So the lumberman, the wagon maker, the furniture manufacturer, the shipbuilder, the railroad and the pulp and paper maker

began to inquire where his wood would come from in the next 5, 10 or 50 years. A hasty and incomplete survey of the situation revealed a most alarming condition. Areas that were supposed to be virgin forest were often found completely destroyed by fire or largely devastated by insect pests. No one knew the actual amount of available timber or the extent of the damage.

An attempt to get accurate and up-to-date figures is underway in a finely organized effort in New Brunswick and beginnings have been made elsewhere in Canada. The United States Congress is at present the scene of an attempt to bring into being a proper Federal Forest Policy as would be provided by the Snell bill. An accurate inventory of the country's forest resources and their conditions is one of the main objects of the bill. The words of R. S. Kellogg secretary of the Newsprint Service Bureau and for years connected with the lumber industry, should be read with great interest. He said, in supporting this feature of the Snell bill: "forest inventory and a census of timber requirements are fundamental to any adequate plan for forest production and utilization. We must find out what we have, where it is, how fast it is growing, how rapidly it is being use, and what we might have if all forest soil were put to work. We don't know where we stand now. We must know if we are to tackle the problem of continuous forest production on an adequate scale and in an intelligent fashion."

An adequate inventory is just as essential in Canada as in the United States; more so, because our industrial success and economic independence are more closely based on the forest as a source of raw material. The security of the $300,000,000 invested in the pulp and paper industry in Canada and the employment of nearly 30,000 persons largely depends on the assurance of a permanent wood supply. A paper mill cannot be loaded on a flat car like a saw mill and set up tomorrow where wood is more plentiful. Nor can wood be brought from increasingly greater—and more and more prohibitive distances. At present we do not know where we stand. We have a bank account, but no bank book. We have been spending our substance riotously and have never drawn up a balance. Rough estimates of growth and consumption show conclusively that we are in a precarious position. A man's expectation of life at fifty depends very largely on his physical condition at that age. We must know the condition and extent of our forests if we are to know how long they will last. A medical examination ten years ago will not get us a new insurance policy today. A timber cruise of ten years ago is an even poorer indication of the forest's condition today. The man is at least alive, the forest may have been practically destroyed.

The perfection of the airplane has vastly simplified the problem. Burned and dead areas can be immediately located and written off and other stands fairly well analyzed. The main thing is to get started. A prompt beginning on a well organized plan is essential. Let the provinces spend some of their forest revenue thus for the benefit of the forest.

IMPROVING THE ACCIDENT RECORD.

A large pulp and paper mill in Quebec records that for about 2,800,000 total man-hours worked in the year, there were 113 accidents in 1919 and 158 in 1920; but while the former cost 1857 days lost time, the latter caused the loss of only 1676. In other words, the frequency rate increased from 40.45 to 55.81, while the severity rate decreased from 0.67 to 0.59. A fatal accident occurred in each year and is not included in the figures. The result otherwise is very encouraging. The experience of this mill is fairly typical of what is going on throughout the Dominion and shows that while much has been accomplished by organized accident prevention work, there is yet much to be done. We have felt for some time that this kind of work might well be made a department of the Pulp and Paper Association, which would make it most effective.

COBWEBS.

The Spanish River Mills at Sault Ste. Marie, instead of a general shut down for repairs and consequent lay-off of help for a week or two, as is often the custom, have been stopping operations one day a week to do this necessary work. The mills could run continuously as far as orders go, but the management is wise enough to apply the principle of Safety First to the health of the mill. It is necessary with machinery as with men, to keep in good condition—repair belts before they break, replace bearings before they burn out or get far out of alignment, fix leaky valves while the loss is small, etc.

In this issue is an advertisement of the Ontario Government for tenders for two pulp and timber limits. The basis of payment is 80 cents a cord for spruce and 40 cents for other pulpwood. How much more will come in as a bonus is what the tender is to find out. Perhaps this is the best way of disposing of timber, but the advantage seems to be principally with the bidder.

Two more pulp mills are promised for British Columbia. They are sprouting at the rate of about one a month.

That fine paper of Howard Taylor's on Ventilation of Machine Rooms unfortunately has to be postponed till next week.

The British Technical Section has 187 members. Good work!

The Annual Banquet of the Canadian Pulp and Paper Assiociation

This important and enjoyable event took place in the Ritz Carlton Hotel, Montreal, Friday evening, Jan. 21. It was the largest banquet in the history of the Canadian Pulp and Paper Association and was a fitting climax to a memorable year. Several days of strenuous business meetings were over and everybody was ready for a good time. If anyone at the banquet failed to enjoy himself it certainly was not the fault of the manager Quick of the hotel or Secretary Dawe of the Association.

There were only two speeches on the program, which, with the brief inaugurated address of the new president, Mr. P. B. Wilson, started the evening very auspiciously. Following the serious introduction, a varied and excellent program kept the guests entertained till it was tomorrow.

Address of President Wilson.

When the toast to the King had been proposed and drunk, President P. B. Wilson of the Canadian Pulp and Paper Association addressed the gathering as follows:—

Gentlemen: I appreciate more than I can say the honor you have bestowed upon me in electing me President of this Association. At the same time I feel lacking in those qualities for which my predecessor is so well known, including his wonderful ability to crystallize his valuable thoughts on all matters into sentences which appeal. As an example of this I should state that when Mr. Chahoon wrote to me asking that I allow my name to come forward for the Presidency, in giving me some advice as to the conduct of this meeting he said that in his opinion what we needed at such a meeting was "wit, not work". I am going, therefore, to take credit to myself for being the next best to the originator of a good sentence, by being the first quoter of it.

I realize, of course, that at the annual banquet held in Montreal, if anything serious is to be said it must be said very early in the evening, and as I have been described on the screen as being your new "pilot',' I want to say that in that capacity I shall certainly steer you straight, although in looking round this room I realize that I might have some difficulty in steering you very straight this evening.

The Association has passed through a year of unexampled prosperity. The men have made more money, the producers have made more money, and even the consumers of our products have made more money. We have, in fact, taken the tide of prosperity at the flood, and, as we all know, we have to take the current when it serves or lose our ventures. I wish it to be understood that my connection with a company which deals solely in newsprint will not, I hope, cause me to lose sight of the other very important interests served by this Association, and I mean to give a large part of my time to the consideration of the problems facing the producers of sulphite, groundwood, board, bag, book and writing, wrapping and all other papers, the total output of which is, of course, very large. The importance of the industries covered by the Association may be expressed as involving the production of commodities during the calendar year 1920 amounting in value to more than $200,000,000. Our exports alone for the year reached a total of $163,127,982, of which at least $125,000,000 represents exports sent to the United States. In this connection the industry has been of incalculable value to the exchange situation, and I hope Sir Henry Drayton, on my right, will take note of that fact.

The work of the Association during the past year, when it had the great advantage of being under the direct management of Mr. Chahoon, has been very important. One of its most important undertakings was in connection with the Central Institute of Industrial Research, which is being instituted at Ottawa under Act of Parliament. In this connection, a committee with Col. C. H. L. Jones at its head has been formed to take the greatest possible advantage of the facilities offered by such an Institute when it is established. The fact that the Institute at Ottawa is quite in embryo at the present time will not necessarily postpone or prevent the activities of this committee, because it is intended to make use of the equipment already existing at the mills which are members of this Association, and we should all feel it important that the mills should throw open to this committee any processes they have or any research work being done in order that all the mills may take advantage of the research work of any one mill. As someone said at the Technical Section meeting, a mill that closes its doors with the idea of keeping secret its own work, shuts out far more than it shuts in, and I hope we shall all remember this when the occasion arises for us to be asked to further industrial research by admitting the proper persons to make investigation of our processes.

The Institute of Industrial Research is of importance also from the fact that it tends to foster technical education of Canadians. We have in our mills a large number of American and other outside operatives and they do most excellent work, but we ought to be raising Canadians equipped technically to carry out such work.

Another matter which has been much discussed during the year is that of scientific forestry in the different provinces, and it is most desirable that it should be continued both from an industrial and a national point of view. The Governments of Quebec and Ontario in particular have shown a keen sympathy and desire to promote the welfare of the industry and also of the public along these lines. But no Government can move faster than public opinion will sanction, and therefore a great task lies before the Association in organizing, educating and enlightening the people as to the value of their heritage and the means which should be taken to conserve and renew it. Governments, in short, "are" the people.

Nor must it be lost sight of that the industry contributes very largely to the revenues of the respective provinces. The Quebec Government last year derived from its forest resources, principally from its pulpwood limits, over $2,600,000, or about 15 per cent of its total revenues. This, no doubt, accounts for the fact that the Provincial Treasurer, on my left, the Hon. Walter Mitchell, is the only provincial treasurer able to show a surplus in his finances. This year, of course, the amount will be much greater because of increased

license fees and stumpage dues. Ontario during the last five years has drawn an average of $1,850,000 annually from forest reserves, or about one-ninth of its total revenue. I suggest for the consideration of these and other provinces that it would be good business to put back at least 50 per cent of the revenue so obtained into the conservation and reforestation of their timber limits, thereby insuring to themselves a steady and permanent revenue.

There is one feature of our situation which I should like to impress upon you, and that is the need, greater than even before, for co-operation, confidence, and mutual assistance among the members of the industry. The perplexing character of the problems now before us are not less acute than those which we have been called upon to solve during the past few years of our existence. Of course, during War time we had to solve difficult problems. But now we are going through a readjustment. Deflation and its effect upon trade in general is upon us. Nevertheless, I believe that the present trade depression is merely the logical aftermath of the long period of inflation, and that it has now reached its lowest point, or, if not, that it will not last much longer and it is fair, I think, to assume that it will be followed by a long period of really stabilized conditions such as existed before the war, except that as we now understand the problems and principles of our trade we should be able to get better results.

The present time is one, first, for cool judgment and, secondly, for a deliberate and continuous policy following such judgment. The industry is to be congratulated upon the manner in which it has so far met the transitory conditions through which we are passing, and its members will be well advised to proceed further along the course they have mapped out for themselves, that is, a course of steadiness and straightness, and should avoid being stampeded into unwise or precipitate actions.

I have no fear as to the future because I know that the relations between the manufacturers and those we serve are immensely better than they were. What we need is absolute sincerity of purpose, integrity in our dealings with each other, and with our customers. Surely we are too old at this time to have to consider the point as to whether it is good business to lay all our cards on the table. I say we have no time, and there is no need to examine into the "bona fides" of the people with whom we are doing satisfactory business, and I believe that Canadian business has vastly improved in the last few years in this respect. Co-operation may require self-sacrifice and self-abnegation, for the good of all; but so long as we have confidence in each other we shall, I am assured, go forward from success to success. But we must be deliberate in our judgments; we must make no hasty decisions; and if we do this and follow out the good old Anglo-Saxon rules of steadiness in business we shall lay the foundation for years of steady prosperity. Canadians are not given to hasty actions. They deliberate upon the points in question and then move quickly to give them effect.

The outlook is excellent, but we must remember that Oliver Cromwell, while trusting in God, kept his powder dry.

Do not let us forget in these times Mr. Montgomery's sermon delivered at this function last year and the moral he drew respecting the conduct of Rheoboham. At the same time we must conserve our resources and impress it upon those with whom we come in contact to do the same.

Gentlemen, I thank you for the very close hearing you have given me, and I express the hope that I shall not be too disappointing during the ensuing year in the conduct of the affairs of this great and successful Association.

At the close of his address, the President introduced the Hon. Sir Henry Drayton, K.C., K.B., M.P., Minister of Finance of the Dominion of Canada.

Sir Henry Drayton's Speech.

In opening his remarks, Sir Henry Drayton first paid a touching tribute to his late friend and colleague, the Hon. Arthur L. Sifton, Secretary of State, whose death had just been announced. He continued:

"Mr. Chairman and gentlemen: Well, aren't we having a good time here to-night? Aren't we enjoying this splendidly? I believe you are going to enjoy this despite anything any speaker can try to say to you.

I will admit that it is more or less of a nuisance to have to listen to speeches — and particularly some speeches. I put mine in among the list, and I want to tell you that it is on your own heads, and if I can stand it, you have got to.

Now, gentlemen, two accidents have happened to-night. They were not such bad accidents after all. You see, the Chairman told me I was to be met. I do not know exactly what was to be done with me, but I was not met because my train got in too soon. By the by, I was travelling via the Canadian National.

But another accident happened to-night. My friend, the Honorable Mr. Mitchell, was also to be met. Unfortunately, his train was late. He came from Quebec, and he was not on the Canadian National. All of this goes to show that accidents will happen, no matter how well we try to look after them.

Now there is another thing that I should tell you at the commencement. I have been told by the Chairman that I am supposed to make a sensible speech — a sensible, solid business talk. Well, that is an awful job, isn't it? This is a tremendous task to be given to me, but you are not to feel downhearted, because while I am to try to talk seriously to you, my friend, Mr. Mitchell, is going to show you how witty some people can be.

But, gentlemen, at the commencement, I really want to talk to you very seriously indeed, because, on this, the first occasion that I have of speaking to my fellow citizens, my first duty is to acknowledge a deep sense of loss which I, in company with colleagues, feel in the death of my late colleague, the Right Honorable Arthur Sifton.

I do not know if any of you, gentlemen, knew Mr. Sifton. He was a man always; he was, for many years, devoted to public service. He achieved fame and distinction as a jurist. He was a most successful Provincial Premier, and at the call of duty came to Ottawa. The Ottawa life is a hard life. The labors are difficult and severe, and the strain intense. Mr. Sifton was not a man of robust health or strength, and I want to say that no man was more faithful to his trust; no man attended to his duties better; no man gave closer attention and better work to Canadian business than did Mr. Sifton, my late, much-lamented colleague, who, if ever a man died in harness, died in harness.

Now, gentlemen, of course the next thing I ought to do is to congratulate you; not only ought I to do it, but I do it, and I do it very willingly, because you are indeed to be congratulated. You have made a magnificent showing; your industry is one which has done much for Canada, but I believe will do more and continue to grow and to expand and do much more for Canada than it has yet done, and more for the Canadian people.

But you have already done great things. When we recollect that in eighteen hundred and eighty-one, there were but some fifteen hundred employees in some forty-one mills — small paper mills — in the whole country; when we remember that in eighteen hundred and eighty-one, the total wage bill of all those mills was but four hundred and sixty thousand dollars, and when we realize that for the year nineteen hundred and nineteen, in ninety-nine large mills, there were no less than twenty-six thousand, seven hundred and sixty-five men working, and that the wage bill distributed amongst our people, from your activities, amounted to the sum of thirty-two million, three hundred and twenty-five thousand dollars, you will realize that you have indeed done great things. You have done great things for yourselves, and you have done great things for the workers. That is no small advance; that is no small addition to the number of men working in this particular industry, and the sum of thirty-two million of dollars is a very large contribution to the support of our industrial population.

It is well for the workers; it is well again for the farmers. Of all the industries, yours, I think, is one which would commend itself even to our farmer friends. And why? Because you have turned what used to be a nuisance and a waste, actually something which had to be got rid of by hard, unremunerative work — you have turned it into an asset. The pulpwood of yesterday, which was worthless, to-day is the foundation for many a prosperous farm, on which the pioneer farmer, in both the bush lands of Ontario and Quebec, tills his farm, until it becomes clear and productive, and habitable for himself and his family. It is waste material which is being changed from waste, by reason of your operations, into material worth sixteen dollars a cord. So you have also done well for the farmer. And besides doing well for yourselves and the workers and the farmers, you have also done well for the country.

We constantly hear much of the great wealth of our undeveloped natural resources. They are great. In them the hope of the country is firmly based and rightly so. Their development will, and can, not only profitably support our population but also the hosts that will be attracted to our shores by the millions of acres of virgin soil and other undeveloped resources awaiting them, as well as by the strength and fairness of our laws, the justice with which they are enforced, and the solidarity, saneness, and reasonableness of the Canadian people.

These resources, undeveloped, merely represent potential rather than immediate wealth. They represent a storehouse, a granary which can only be made available by enterprise, vision and work, by great investment of capital and its intelligent use.

Great as is the value of our prairie lands, they nevertheless support nobody and bring no revenue to the State until they are farmed. In like manner, the country's great resources of pulpwood gave no support to labor and returned nothing to the country until the Canadian Pulp and Paper Industry sprang into being. And so it is a great thing for the country, because to-day that dormant resource is one yielding not only great returns to labor, but, as your President, Mr. Wilson, has pointed out, great returns to the Government, both Provincial and Dominion.

A great thing for the country? Yes. A great thing for the country, because it is time to increase exportations. To-day we are at least doing nothing to our exportations of newsprint. On the other hand, in the market where our dollar is at a discount, and in the market where it is so much in the national interest to do everything we can to right that unfortunate exchange, your shipments last year amounted to forty-six millions of dollars, and I may tell you that your shipments of forty-six millions of dollars into the United States markets, represented no less than ten per cent of our goods exported to the United States.

A great thing for the country: Yes. Because you are still going on, for in the last nine months, as against forty-six millions exported last year, this year you have exported no less than forty-nine millions, six hundred thousand dollars, and that exports to eleven and two-tenths per cent. of this country's total sales to the United States markets. I hope, gentlemen, that your surpluses are still going to grow, and that you are going to export still greater quantities of newsprint—of course, after making a just and ample provision for the home market.

Now, I know, gentlemen, that is something you want to do. Yes, we have had troubles about it in the past. I think perhaps I inherited some of them. I will do my best to put up with them, but we did have troubles, and they were serious troubles. There was much conflict; there was much debate; there was much room for doubt. But after all the hurley-burley and dust have died down, I believe it to be the feeling of you gentlemen, the conviction of this Association, that the home market is the market which ought to be looked after at least upon terms as favorable as those given to the foreign markets. But, gentlemen, you have done so awfully well with newsprint, and I wonder why you cannot do just as well with other papers.

You say "We do"? How much do you export of other papers? Instead of exporting other papers, we have not yet got control of our own markets. Some ten millions of dollars of other papers, cardboards, and other boards, wrapping papers, writing papers, book papers, and the like — some ten millions of dollars were imported into Canada last year, and out of that ten millions of dollars, some nine million, three hundred thousand dollars were imported from the United States, still further depressing our dollar in that market.

Well, gentlemen, I think you will agree with me that if there is any one industry that can be described as fairly indigeneous to Canada, it ought to be the paper making industry. With our unrivalled resources, our wonderful water powers, I wonder if we cannot make our own wrapping paper, because you imported a lot of wrapping paper last year. I believe, gentlemen, that you can capture that market, that you will capture that market, and I will go further than that and say you will not only capture that market, but that you will add to these other papers, and get

something like the same export business in the other papers that you now have in the newsprint, to your own great benefit, and the benefit of our country.

I do not think I have done more than to give a just tribute to what has been done. I have referred to the benefits to the workers, the benefits to the farmers, the benefit to the other Canadian industries, because your industry itself does not take a great deal of other Canadian products. One of the finest things about the situation to-day is that Canadian industry and Canadian foundries can now apparently turn out Canadian products for the use of the Canadian people. I do not know why that should not be so. The first big machine for making newsprint ever made in Canada has just been completed. I hope all your machines will also soon be made in Canada.

You have done it all, and, gentlemen, I think you will all agree with me that while you have done it well, the country is in this position; that while you have reason to expect very fair and reasonable treatment from it, after all, these operations have not been unaccompanied by a generous measure of reward and success to yourselves. You have been successful, and you know that success such as your industry has returned brings with it corresponding duties and obligations, and as your success has been great, and as you have done much, so are your duties and obligations correspondingly heavy — duties and obligations which you are looking after to-day in the practical operations of your mills.

Twenty-six thousand seven hundred and sixty-five of your fellow Canadians you are looking after, and besides looking after that number, you have been looking after a far greater number, because those figures do not include your woods operations. Those figures do not include the work of getting your raw materials out of the bush. You know, gentlemen, I have no doubt, that you are looking after them, but I wonder — I wonder — if you all really visualize and understand what the real, underlying difficulty is, the trouble and worry in the minds of labor, and that is the constant dread of unemployment — the fear of the laborer of losing his job. I wonder if you really realize how deep a fear that is, and how sorely the laborer is affected by it. It is a very happy community in which each man is his own landlord. That is a first-rate place to get to, and I understand and I believe that a large number of your employees do own their own homes. You know that home. I have seen it in the west, particularly in connection with mining towns and with mill towns. I have seen it particularly with regard to the recent trip I made in connection with the Tariff Inquiry. Those homes represent often — very often — not only the savings of a few years, but the savings of a life-time. Everything that the owner has in the world, his whole estate — and in many of these small communities, villages and small towns have indeed sprung into being only by reason of the installation of some large industry. Let the industry shut down, let the wheels cease moving, and that home is useless, and employees must seek work elsewhere, and, gentlemen, I nope you are going to continue to extend, and I hope you will keep your mills running and that they will run forever, and I hope that your activities will increase rather than decrease.

Big industry! I believe, gentlemen, that you are one of the big industries to be found in the country. You know we have heard a great deal about 'big business'', have we not? And an awful lot of the slurs which accompany 'big business' Well, gentlemen, do you think there is anything very wrong, anything very immoral in mere size? I don't. Do you think there is anything very wrong in doing a good thing twice as often? I don't. Or in doing a good thing perhaps a thousand times as often? I don't. If it be a good thing for a company to start a small industry in a community, it would be a good thing for them perhaps to build a factory employing a hundred men, and it ought to be a better thing when that factory is enlarged and modernized to employ a thousand men. One is 'big business' and the other is not.

I wonder if you gentlemen interested in one of the 'big businesses' of this country are not in a position to show that the bigger you have become, the better you have represented your trust; that the bigger you have been, and the stronger you have been, the better, you have looked after your factories and your mills and your men.

Well, talking about big, successful men of business. Do you not think there is another principal duty which is resting on you to-day? Do you not think that that duty takes you in the direction of doing something apart from your own business, but as merely Canadian citizens, something directly for Canada? You know, gentlemen, there is walking up and down the streets now, what well might be called a pessimist. You might call him an idealist of new and untried and fantastical notions. You might call him something worse, but there is a feeling of depression and a feeling of unrest. I wonder why. I wonder if it is because those who really know — the strong men of business, the successful men of business in the country—ought not to be doing perhaps a little bit more in the direction of public affairs. Can you tell why there is this talk of depression ? Here we are this year very largely in a position absolutely different from what we were last yead. Then the whole talk of trouble was high prices and wild extravagance; the nation was going to spend its money in such a way that it would pauperize itself. The cost of living index had gotten up to 263 over the 100 per cent of nineteen hundred and thirteen. That is what the figure was when the cost of living started downwards last year. Now it is all changed. It is all checked. Instead of extravagant buying, we have had buying which has been too light. There was not enough of it. The cost of living has come down. The last figure I recall is 214 as against 263, but the grumbling has increased rather than decreased. Why? Our export trade instead of dropping off as well might have been expected in view of the disorganized state of export markets has increased. Our domestic exports down to the end of December are $33,000,000 higher than they were for the same period of last year, notwithstanding the fact that prices have materially dropped. Our bank statements make an excellent showing for the financial institutions of our country. The real fact is that we are relatively in an excellent position, relatively better off than we have ever been before. With a proper confidence in Canada and ourselves, working in accord and forgetting all prejudices and selfishness that injures a common effort, let us make sure that the year 1921 will be a year of progress.

Of course, there is much to be done. Our large, unfavorable trade balance with our friends in the great republic to the South, with the resultant depre-

ciation of our currency in their exchanges, is certainly not to be desired and ought as much as possible to be remedied. Our resultant war burdens mean heavy and continued expense. New or extended sources of public revenue must be found.

There is work for all of us. The tasks ahead of Canada will be discharged but by the work of all her people, certainly not by the efforts of any government, no matter how able it may be. Canada requires greater production. Just as soon as possible, to be running full time and with 100 per cent efficiency. This result will not be attained either through government interference or paternalism.

I have already referred to the duties arising out of your business, but your work is by no means finished, your obligation by no means discharged. Every Canadian ought to take a direct and intelligent interest in his country, much more so, every Canadian who has amply proved his brains and ability in the commercial field.

After all, the business of government is closely affiliated to ordinary business, as you understand it. It is not only big business, it is the biggest business. There is of course a difference between it and your business. For example, those actively engaged in it are paid but what you would call small salaries and in the place of dividends generally receive abuse and lots of it. But after all it is well worth it. No dividend, however large, can be so great as doing something, however little, to help Canada, to make this country a better and happier home for its citizens. And, gentlemen, the call for a sane and insistent interest in your country's affairs was never so great as now. And you gentlemen are particularly interested and personnally. Revenues must be maintained. The country's financial requirements are great. You must be taxed. You are much interested in seeing that no form of taxation is adopted which will unduly hamper and restrict production and business in any one of its many activities. You are also much interested in seeing that the cost of government is reduced to the last cent compatible with the proper discharge of public business and the requirements of public service. Canada asks you for a careful, unselfish consideration of her many problems. Will you deny her?

At the close of the address by the Minister of Finance, the feelings of every one were expressed by President Wilson, who said: We owe Sir Henry Drayton a vote of thanks for the most excellent speech he has delivered to us.

There are four things I want to assure Sir Henry of, on behalf of this Association. One is that we will do big business; we will keep the mills running; we will supply Canadian publishers at reasonable prices, and we will willingly bear our share of the taxes.

I thank you, Sir Henry.

I now have great pleasure in calling upon the Honourable Mr. Mitchell, the Provincial Treasurer of Quebec.

Address of Hon. Walter G. Mitchell, K.C., B.C.L.

I appreciate very highly the privilege of being here to-night and I sincerely hope that the relationship that has existed between the Government, which I have the honor to represent, and your Association, which has been so very agreeable to both of us, I believe, in the past, will continue.

Sir Henry Drayton, however, has made my task an exceedingly difficult one. He has made a very serious speech and announced to you that I was going to make a witty one. I do not know of any undertaking that any man could attempt that is more difficult than to try to make a witty speech, even if he is able to, after that remark.

Sir Henry Drayton says that he arrived by the Canadian National. It has changed its name so often that I have forgotten what name to call it by. My only explanation of the fact that Sir Henry arrived ahead of time on the Canadian National is that he must have left on yesterday's train.

Your Chairman, gentlemen, has just told you that your Association contributed fifteen per cent of the revenue of the Province of Quebec.

Insofar as we are concerned, gentlemen, we look upon you pulp manufacturers of the Province of Quebec and the Dominion of Canada as partners, for the purpose of developing the great pulp and paper industry in this Province. I know you want to contribute to the treasury of the Province of Quebec, and I am sure that you want to contribute in a very large sum. The only condition that I am sure you will put upon it is that we see that the money that is contributed by you, or any tax-payer in this country, is properly expended for the benefit of the people of this country.

The kind of partnership, Mr. Chairman, which I understand IS a partnership is one for the benefit of both the partners, and not the kind of partnership which I ran up against a good many years ago when I was practising law. One day a fellow by the name of Joe Leblanc came in to see me and told me that he had got into difficulties with another chap. They had bought a cow together, and Joe told me that the other fellow pretended that Joe owned the front end of the cow and the other fellow the back end. I did not know how to solve the problem. Joe claimed that he had to feed the cow and the other fellow was getting all the milk. I did not know how to solve the problem, and I told him to go out and try to settle it. (That is the way we lawyers do when we don't know how to advise our clients). I did not see Joe for sometime and one day I ran across him, and I said "Joe, what happened about the cow?" He said "I could not settle." I said "What did you do? How did you fix it up?" He said "I fixed it up all right. I killed my end and his end died."

What we want, gentlemen, is the kind of partnership where we both put into the feeding end, and we will both take out the profits; this kind of partnership that we want in this country from the Atlantic to the Pacific is co-operation between one and all.

I was a little surprised here tonight. I came here expecting to meet a lot of people from the great American Republic to the south of us, and I believe there are many here. We welcome them; we welcome them, and we also welcome those from the great Province of Ontario.

Gentlemen, now for just one minute of seriousness. I was in New York some little time ago with my friend, Mr. Chahoon. He and I travelled all over the city of New York trying to get a drink—for Mr. Chahoon. Finally we discovered a place where you could get a bottle for fifteen dollars. I did not know his Grand'-

Mere tricks. He made me put it in my hip pocket, and we started back home. Unfortunately, I was hit by a street car as we were crossing Forty-second street, and as I sat up I felt something trickling down the back of my leg. I told my friend Chahoon about it, and he said "I hope its blood".

I do not intend to detain you long, but there is one point I would like to make, and that is that I agree with Sir Henry Drayton—sometimes. I think on this occasion I must agree with him when he says all we have got to do is to have a stout heart, and to be optimists from the word "Go".

We have come through four years of war, and if tonight, gentlemen, you who are apt to be pessimists will just go back to Nineteen hundred and fourteen, when war was declared, and think of the feelings that animated us at that time—why, gentlemen, we did not know what was to become of the British Empire and her allies; nor did we know what was to become of our country; whether it would be ruled by the iron rod of the German Kaiser—and then think of our feelings here tonight, when we have not a worry, and have nothing else to do but to put our hands and shoulders to the wheel, and march forward for the purpose of building up this country, and the great British Empire to which we belong.

There is a cure for this. With all due respect to you, Sir Henry, and to the Government to which you have the honour to belong, with all respect to the Government of the United States, with all respect to all the Governments who attempted to regulate and fix prices by legislation—I believe there is only one cure for the ills from which we are suffering, inflated currency, high prices, not enough production for the consumer, and that cure is economy in government, whether Federal, Provincial, or Municipal, and economy by corporations and economy by individuals. The second cure, gentlemen, is work, more work, and again hard work. The third cure is co-operation between all men for the future of our great country, and when I say "co-operation", Sir, I mean co-operation between the capitalist and the laborer; I mean co-operation between the manufacturer and the farmer; I mean co-operation between all nationalities and creeds. I believe in co-operation of all the people of this great country from the Atlantic to the Pacific and from the Forty-Ninth Parallel to the Arctic Ocean.

Do not forget, gentlemen, you who are employers, that the laborer has rights; do not forget, sirs, that the farmer is just as necessary to produce the food stuffs which your laborers consume as the capitalist is to labor, and the laborer is to the capitalist. Remember it is one great machine working together, and if one of the cogs goes wrong the whole machine stops.

I ask you as individuals—each one of you—to look at the other man's point of view at all times, and upon all occasions, and when I talk to them I will tell them to look at your point of view, and remember that capital is entitled to its profits. For, unless you give capital the profit to which it is entitled, it will go to some other country which will mean the closing down of our factories, and no more market for labor, and no more consumers for what the farmer produces.

So I say, gentlemen, let us economize from one end of the country to the other. Let us work night and day until we have replenished the world with what the world requires. Let us co-operate one with the other, for the better living conditions in this country, and for the up-building of this great Canada of ours, and when I say "co-operation", Sir, I want further co-operation than that, because here in the Province of Quebec we have had difficulties in the past, but I say to you, Sir, as one of the great leaders of the Province of Ontario, that, so far as the Province of Quebec is concerned, that bye-gones are bye-gones, and we are giving you our hand of fellowship and marching together as Canadians, proud of belonging to the British Empire.

Gentlemen, just one more message to all the people of Canada, and that is, let us respect the views of others. It matters little to my mind whether a man worships in a Roman Catholic Cathedral or a Protestant Chapel; surely we are all praying to the same God, but we need a unity of creeds, of nationalities, and need to have one standard, pure-blooded, four-square Canadianism.

Gentlemen, we had in the great war which ended in Nineteen hundred and eighteen, as allies. the great American Republic to the south of us. Gentlemen, when I speak of co-operation, I ask them to remember, and I ask all Canadians to remember, that if we go back a generation or two, we find the same ancestors, and today we are cousins upon this great American continent. I ask them for co-operation, and I say, let us work hand in hand, as we are working in this country for the up-building of this great continent of America, and Mr. Chairman, with your permission, I will read the sentiment that is in my heart toward the whole great American people, and that is applicable to the flags of the British Empire and the great American Republic:—

"Twine them together in peace and war,
Together on land and sea.
From the Southern Cross to the Northern Star,
From the purple east to the west afar,
Wherever the hands that bear them are,
Flags of a kindred free."

T. A. P. P. I. PUBLICATIONS.

The Technical Association of the Pulp and Paper Industry has issued another important contribution to the literature of pulp and paper manufacture. A copy has just been received by the Pulp and Paper Magazine.

Technical Association Papers, Series III, contains the papers and addresses presented at the Fall meeting of the Technical Association of the Pulp and Paper Industry at Saratoga Springs, N.Y., September 1 to 3, 1920. Besides the reports of standing committees and the discussions of papers, the volume contains transcripts of addresses delivered at the banquet tendered to the association by the manufacturers of the Hudson River Valley and a report on the measurement of pulpwood issued by the Newsprint Service Bureau. Among other subjects dealt with are Tests for Unbleached Sulphite and Soda Fibres, Use of Sulphur in Soda Pulp Cooking, Substitutes for Alum and Rosin, Automatic Cooking Control for Chemical Pulp, New Device for Cleaning Paper Felts, Automatic Mixing System for Paper Stock, and Fireproof Hood for Machines. The publication contains in addition a list of the officers and committees of the Technical Association of the Pulp and Paper Industry, the revised text of the constitution and by-laws and a directory of members of the association. Copies will be sent postage paid to any address on receipt of $2 by the secretary of the association, 542 Fifth Avenue, New York, N.Y.

An Industrial Research Department

SCIENTIFIC AND INDUSTRIAL RESEARCH IN CANADA.

Address of Dr. R. F. Ruttan before the Technical Section, C. P. & P. A.

In connection with the discussion of the report of the special committee, Dr. R. F. Ruttan, head of the Chemistry Department of McGill University, addressed the Technical Section as follows:

Mr. Chairman and gentlemen: I hope that the establishment of an active Research Institution will be of great benefit, not only to the paper industry, but to all the industries in Canada. We are all interested in exports, and it will be necessary for us to produce in this country the very best articles we can produce, to meet the competition from the outside.

In England, as many of you are aware, there is a system of guilds or associations for co-operative research. A small set of organizations are being contemplated — and some are actually in existence — in the United States. There are twenty-three different organizations in England. The manufacturers in each industry are grouped together; each with its own research laboratory; each research laboratory has men in charge who are receiving a far better salary than the Professors of the Universities. Each of these large laboratories is supported in part by the industry, and in part by the Government. The object is to enable the English industries and manufacturers by improving methods and products to hold their own in competition with the world.

Now, the paper industry in Canada is our great export industry. It is now in a prosperous condition. It is able to supply — as we already know — the funds for the establishment of a research laboratory to carry on scientific research, provided there is co-operation, not only as an industry, but individually. England has found that the closed door in industries shuts out more than it shuts in, and the individual manufacturers have united whole-heartedly in contributing all they can toward the advancement of the industry as a whole.

Co-operation among industries is more difficult to carry out — and I need scarcely point this out to business men — where there is local competition, where the only market for instance is in Canada, but where there are foreign markets, I think that a united effort in research is the one thing which will make the paper industry what it would be — one of the great world industries.

I want to give you some idea of this Research Institute, to enable you to decide whether it is possible for us to help you, and if it is, we want to do it. I am not going into the history of it. We have passed through many vicissitudes, but we have the promise of the Premier this year, and a certain number of the Cabinet, that the Research Institute will be established this coming summer. An Act — a preliminary draft of which I hold in my hand — was approved in the Committee of the House of Commons last year, and approved by a Special Committee of the Privy Council, and — although not brought forward formally as yet — it will probably be the Act which will govern the new Research Institute. I will not read it all to you, but I will tell you what we are after.

It says, among other things:

"The Institute shall have charge of:

(a) The investigation and determination of standard and methods of measurements, including length, volume, weight, mass, capacity, time and heat, light, electricity, magnetism, and other forms of energy, and the determination of physical constants and the fundamental properties of matter.

"(b) The standardization of the scientific and technical apparatus and instruments for government service, and for use in the industries of Canada, and the determination of the standards of quality of the materials used in the construction of public works and of the supplies used in the various branches of the Government Service.

"(c) The investigation and standardization of the materials which are or may be used in the industries, and of the products of the industries.

"(d) Researches undertaken with the object of improving the technical processes and methods used in the industries and of discovering new processes and methods which may promote the expansion of the existing industries or the development of new Canadian Industries.

"(e) Researches undertaken with the view of utilizing the waste products of industries.

"(f) Researches undertaken to promote the utilization of the natural resources of Canada.

"(g) The Institute shall have charge, direction or supervision of the researches which may be undertaken by or for single industrial firms under conditions to be determined in each case, or by such organizations, to be known as Trade Guilds for Research, as may desire to avail themselves of the facilities offered for this purpose by the Institute."

The Institute is to consist of a building 200 x 50 x 70. It will cost about three hundred and fifty thousand dollars. It will have a central power plant outside, capable of extension. That is the first unit. This will be built in such a way as to be fire proof, walls moveable, laboratories constructed to any size throughout the whole building. A number of smaller buildings, some of which are in existence at the present time, in the property we are considering, can be used for carrying on special work outside, away from the main building. These would be particularly for such industries as would require an especially large plant, and where the operations could not be extended over a very long period of time. In the main building, will be the administration department and a variety of laboratories under experts, to which the whole country could go for physical, mechanical or chemical data of their different works or industries. Much of the work will be directed toward certain industries which have a certain amount of standardization to be carried out.

It seems to me this institute is a pressing need of your industry, I will be direct and say why I think the Forest Products Laboratory failed to benefit the Pulp and Paper Industry to the fullest extent. I am a member of its advisory committee. It failed chiefly because its staff being under the Civil Service Commission, the Government did not pay salaries sufficient to obtain and retain first-class research men to carry on the work in these laboratories, which had such splendid possibilities. We expect to avoid this danger.

There is one clause in this Act which says that the Civil Service Commission shall not have control of the scientific appointments to the Institute, or even of their clerks or typewriters. It is to be entirely under the control of the Research Council, so we would be able, as a body — with the consent of the Committee of the Privy Council — to select whom we considered the best men in the country or of any country — because we are not going to be limited by the borders of Canada in selecting the personnel — to form its staff of investigators.

The first thing would be to find a director, and when we remember that some of the large industries in the United States are paying from twenty to twenty-five thousand dollars a year for their directors, I do not think that Canada should be very far behind for a National Research Institute.

"Now, exactly how can this Institute be of use to the Pulp and Paper Industry? One thing is obvious. Experiments on a large scale must be carried on in the mills, but when you want the advice of the very best physicists, the very best chemists and engineers, the very best in a variety of different branches, the Institute will be able to give you that advice, and we trust that when this Institute is completed — which will be in about eighteen months — you will avail yourselves of the help that we hope to be able to give you.

I sincerely hope, Mr. Chairman, that this very influential Section of the Pulp and Paper Industry will endorse this idea of the Research Council, and use their influence to have it strongly advocated by the Government in the immediate future.

There is a tendency in political affairs, whenever there is opposition, to postpone a decision. It is absolutely essential for the future of Canada that this National Research Institute should be established at once. We hope to be able to break the ground when the frost leaves next spring.

Opinion of an Absentee.

The following comment on the Research Department is from a member (Correspondence to the Editor.)

Referring to the debate on the "Industrial Research Department" at the recent Technical Section meeting, one member is reported to have proposed that a Research Committee be permitted to establish themselves in various mills and "investigate conditions there." Surely this is a rather unfortunate way of expressing things. Let me ask, where do the scientific staffs already stationed at these various mills, "get off at," to use a vulgarism? Such an idea, if carried out in the manner suggested would likely cause untold friction.

If we are to have examiners, to examine the examiners (scientific staff) where are these super-men to come from?

They certainly do not exist in Canada to-day.

Such an idea might be O.K. for some mills, employing young and inexperienced workers, but how about the other mills with technical men of from ten to twenty years solid work in the P. & P. industry to their credit? Would these latter, smilingly lie low, like Brer Rabbit, while men of actually less experience than themselves sported around the mills trying to discover something wrong in the scientific organisation? No, I think not!

Now, Sir, I think that the idea of a Central Research Bureau is the finest thing possible, or will be, for the P. & P. trade, and that it will more then repay the industry for almost any amount of time and money spent upon it. As to the co-operation of the various technical men in the mills, I, for one, am fully prepared to do my bit in that direction, in fact I have already done quite a bit, in work not unconnected with the committee on Mechanical Standards.

Anyone who has done any research work around the mills, fully knows that there is an enormous amount still to do and that only co-operation on a large scale can bring much result on some of these problems. The committee on mechanical standards did not have much co-operations from other sources, and it appears that unless men of the greatest possible "tact" be picked for the proposed Research Department, that even worse may occur when the department gets to work.

The views expressed in this letter are purely personal, but after twenty years technical experience in the mills I think I am safe in saying — Beware of "Visiting Research Committees" and "Excelsior" to the idea of a Central Research Bureau with its affiliations with the various mills.

Yours truly,

"IDIOT."

P. S. Use of the word "tact" is not meant to cast any doubt on the committee of Mechanical Standards, but to point out that "tact" in the leadership of the proposed Bureau is likely to be as important as scientific knowledge.

Approved by the C. P. & P. A.

The report of the Special Committee was brought before the meeting of the Canadian Pulp and Paper Association, January 21. On motion of Mr. McKee, seconded by Mr. Kent, the reports of the Sections, which were in the hands of members (see last issue of this magazine) were accepted as read.

The President (Mr. Chahoon) then said: In Mr. McKee's motion he excluded the report to be made by Colonel Jones on some special work that we are all extremely interested in, and that is, our research work. This matter has been laid before all of you members, and I think we should hear Colonel Jones' report, and should take what action is seemed advisable. Colonel Jones, will you please read your report?

Colonel Jones: Mr. President and gentlemen: This is a report of the Joint Committee appointed by the Association, consisting of three members from the Technical Section, and three from the Association proper, to investigate the possibilities with respect to the institution of the Department for Technical Research within the activities of the Canadian Pulp and Paper Association.

The report as read by Col. Jones is found on page 127.

Colonel Jones added: This report was submitted to the Technical Section just in this way, and it was passed by them, accepted by them, and passed on by them to this general meeting.

The Committee, when they first undertook this work, perhaps had many doubts on the whole subject, but we had a most interesting meeting, and the final result was that we were of one accord, first, on the feasibility of the whole matter — the desirability of the whole matter — and then upon the general working out of the matter. That is, that it should be approached in a very slow and careful way; nothing at all radical was contemplated. We felt that in the first instance the great necessity was to secure the man with the ability to carry this work on; that a wide,

important field existed for research development, and if the right man could be found who would review, first, the situation and discover what problems of research and general development were facing us, that he could, without having a laboratory to start with, and without too large a staff, commence this work. The Committee did not feel, for instance, that any results would probably be forthcoming for perhaps the first two years.

Of course, the great thing is to secure the man and the Committee have been devoting themselves to that, although they have no one in view. When I say "They devoted themselves to that", I mean in a very preliminary way, knowing, of course, that their final action depended on the result of the adoption of these recommendations today.

The President: I think we have all heard Colonel Jones' report of the work of this Committee with a great deal of interest, and I think we all appreciate very thoroughly the possibilities, and I would like to know if it is the pleasure of the Association as a whole to adopt in principle the report as made by this Committee. If so, will someone kindly move the adoption of the report?

Mr. Sabbaton: Mr. President; as a member of the Committee on which Colonel Jones has just reported, I would like to urge upon the Association that there should be a free discussion upon the question before the adoption of the report. If we are going to have a formal adoption with a lot of questions in the back of the minds of some of the members, we had better not adopt it. Unless the Association and the various mills are going to stand behind this movement and be willing to co-operate with each other, we had better not spend the thirty-five thousand dollars, because it will be absolutely wasted.

The question is a big one, and, as I said before, if it is going to be at all successful, it must be gone into whole-heartedly, and I think some of the members present should get up and say something about it, and ask some questions, and perhaps the members of the Committee may be able to enlighten them and help them on the way to work up some enthusiasm among the members.

The President: I think from what you have heard from Mr. Sabbaton that it is quite evident that Colonel Jones and Mr. Sabbaton and the other members of the Committee are quite prepared to discuss this matter in as much detail as you men would care to discuss it, and I think they are prepared to answer any questions, if you will be good enough to ask them.

As Mr. Sabbaton has said, it is a big question, and if this project is going to be worked to a successful conclusion, it has got to have — it must have — the hearty co-operation of everybody; everybody should be of one accord in the thing.

Personally, I believe that there are very wonderful results to be obtained by it if we go at it right. Now, if there is anybody who has not had the pleasure of discussing this question in person with the members of the Committee, will ask any question be cares to about the proposed work — how it is started, and what is to be accomplished, I think now is the opportune time to thresh the matter out.

The Secretary, (Mr. Dawe): We have had a great many replies to letters sent to members. In fact, we have received replies from over sixty per cent of the membership, and without exception, the replies have been in favor of the principles laid down.

Some of the members have gone further, and have gone to a great deal of trouble in giving their personal opinions of what should be done; where the pitfalls lie, and their doubts, is order that we may have the opportunity of explaining how these doubts may be overcome.

Taking it generally, though, the industry appears to be ready for the entire proposition, and are quite willing to accept the leadership of the Committee appointed by the President.

The Western mills are doing their own research work and perhaps some of them consider that they are too far away to be of any assistance. They have been giving their financial support, but they do not feel that they can give us much moral support on account of the distance.

Mr. Stadler has written a letter in which he states that it is his view point that there must be uniformity about it; that is to say, that every mill must come in and give their co-operation and moral support, and not merely write a cheque.

We have other letters from the St. Maurice Paper Co. and the Abitibi Company, and from some of the smaller mills, such as the Book and Writing Section.

The President: In that connection, I do think that it is the intention of the Committee to recommend that we do not get any central laboratory at this time, but only to use the equipment we already have. In talking this matter over with the Committee, I gained the impression that this organization which they hope to build up, would be able to use the facilities that we already have. For instance, if one mill has an equipment with an experimental digester to experiment on the use of the different woods and different kinds of acids and under different conditions, that all that class of work would be done at that mill and the results obtained would be distributed to the industry as a whole. Another mill might have an experimental grinder, or has facilities for making experiments along the mechanical end of the business, and all these experiments would be carried on in this plant and distributed to us.

Colonel Jones: The report, you will recall, states distinctly that an attempt should be made at the present time to build a central laboratory. As I stated, the first work of the Director of Research, as the Committee see it, should be to review the field, and to state what problem he finds. That is, he personally discusses with all the members of the Association the general problem and those would be studied and set forth. His great work to start off with would be the co-ordination of the research work that is at present under way. We think that is of vast importance — the co-ordination of the field of effort.

For instance, in one of our Committee meetings we found that three of the large mills had all been working on the same problem; all spending money on the same problem to attain the same end. Well, that meant that three times the amount of money, anyway, necessary to discover the same thing was being expended, and so co-ordination of effort would effect real economy on the face of it, and we believe that is one of the things we must get — the co-ordination of effort after the problems have been studied and the field reviewed, as I have said before.

Mr. McInnis: Mr. President and gentlemen, I just wanted to say a few words about this, because the only gentlemen who have spoken so far have been on the Committee, and in my wanderings around the hotel

this past few days, I have found considerable difference of opinion on this thing, and I would like to express how I think we understand it now.

I do not think there is any question in the minds of any one of us as to the necessity for this project. It seems to be, and it is, in fact, absolutely necessary. In the Technical Section they came to the conclusion, I believe, that, so far as the Technical Section was concerned, they were ready for it. It was purely a question of whether the managerial end of the business was ready.

Now, I have a lot of doubts in my mind as to how this will be worked out, and so have other people. In fact, the Committee have already found these doubts and have drawn them to our attention, and it would be impossible, it seems to me for any one individual or any group of individuals to lay down just what method should be followed.

As Colonel Jones has so well stated, this thing is going to take two years before we can receive any adequate result, so the problem, it seems to me, resolves itself down to a point as to what method of procedure shall be followed. It looks as though it was impossible to say off hand what procedure shall be followed, except as appears in the good judgment of the Committee from time to time, and then work this thing out.

There are many pitfalls and many problems as well and a lot of questions might be asked on all sorts of things, and I do not see that, as far as the Abitibi is concerned, that we can do anything else except to say that we are for it, and to do all we can to work the thing out, but how it will be worked out, will have to be left in the hands of the Director of Research, and the gentlemen working with him.

The President: I also think this project should be accepted or rejected as a whole and the details of the work should be left to the incoming management of the Association.

Mr. McMillan: I think the work could not help but be beneficial, provided they have the support — the co-operative support of all the members of the Association. I should imagine that the doubt would enter in as to whether that work will be supervised continuously by men who are capable of getting the full benefits from it. The trouble is, in an experience of this kind, there is a "hit-and-miss" management of it. It starts out with a great deal of enthusiasm, and when the man in charge of the work needs help, it takes him a month or two to find somebody in the industry who can give him the help, but I think if the incoming administration of the Association will appoint a Committee which is willing to serve and direct the work continuously, I think perhaps the success or otherwise will accrue right in that actual supervision. I think failures in industrial work in your industry can be attributed more or less to the lack of time and effort put to that work by people who can give it, and I should imagine, after the criticisms I have heard, that this may get into a "drifting stage" and be nobody's job, and therefore, we would not get the benefits which can be obtained and which we so much desire.

Mr. Bothwell: I would be glad to move the adoption of the report of the Committee. I do not think there is any danger of it entering the "drifting stage", and not being successfully carried out under the able management of Colonel Jones, Mr. Sabbaton and Mr. Stadler.

Mr. Kent seconded the motion, which was carried unanimously.

Colonel Jones: I wish to thank the meeting on behalf of the Committee, for the confidence they have expressed in adopting the report, and I wish to point out now that the Committee was a joint committee appointed by our president, three from the management branch and three from the Technical branch, and our duties have been completed in putting the report before you, and getting the data together for it, and as it stands now, the work will really be in nobody's hands, and I just wish to ask that some action toward the continuation of that work should be taken at this meeting — some means of carrying it out. In other words, you adopted the report and there is no medium for carrying it out. There is no committee.

The President: The Association as a whole has approved the scheme, and now the incoming Executive will have to put the proper machinery in force to form a new committee to get the work started.

C. P. P. A. Approves National Research Institute.

Mr. Sabbaton: Before leaving the question of this research work absolutely, I would like to propose that this Association as a whole put forward a vote approving the confidence of the Federal Government in the establishment of a National Research Institute. (See p. 159.)

Colonel Jones has referred to that matter in his report, and the Committee is heartily in favor of this Act which it is proposed to bring down at the next Session, and I think the Government's hands would be materially strengthened if they had the approval of this Association to the Act that it is proposed to put into force.

I would like to move that this Association approve the form and terms of the Act which is entitled "An Act to Establish a National Research Institute."

Mr. McKee seconded the motion, which was carried.

First Volume of Text Book Appears.

At the annual meeting of the Canadian Pulp and Paper Association, the President Chahoon, called on Mr. George Carruthers, chairman of the Joint International Committee on Vocational Education, to report on the progress made.

Mr. Carruthers replied: I am pleased to report that splendid progress has been made with the manuscript which is to make up these text books.

Our industrious editor has discovered some considerable difficulty in connection with some of these manuscripts which are being written by very busy men; men who know their subject perfectly, but have so many other interests that it makes it rather difficult for them to deliver the goods on time.

We have, on the committee, a friend at Court, in the person of Mr. Kellogg, who has succeeded in getting from the printers at four o'clock on the afternoon of the day he left New York, the first volume of these text books, which consists of mathematics, reading, working, drawings and physics. If you will examine the volume which is on the desk, you will find that it does differ from the ordinary mathematics and physics in this respect, that it is made suitable for correspondence instruction, and the problems are set in terminology of the problems which arise in this industry.

The Editor, Mr. Stephenson, is present, and if there are any questions with regard to certain features of this course, upon which any one requires further information, I have no doubt he would be delighted to supply the information.

While on my feet, I want to express the feeling on behalf of the Committee, of appreciation for the confidence that has always been expressed by the industry on both sides of the line in the work we are carrying on. It is a difficult task to carry out in the manner we have in mind. We, of course, could have had the five volumes ready for you sometime ago, if it had not been for the fact that we are rather exacting as to the character of the information which we propose to have included in these volumes.

I trust, therefore, that it will meet with your approval to supply the other five thousand dollars which we need in order that the work may be carried on.

The New Officers.

A brief announcement was made last week, but lest any one miss the manner of their choice, the last item of the annual business meeting of the C. P. & P. A. is given, as follows:

The President: If there is no other new business to come before the meeting, it is time for me to fold my tent and ask for nominations for the incoming president.

Mr. Carruthers: Mr. President and gentlemen: I think that we have been particularly fortunate in the choice of presidents which we have had in the past for this Association. The reason for that is not far to see. Great care has been exercised in the selection of these men, and as you all know, we happen to be now in a period of readjustment, and we happen to have some very important problems confronting us, such as research work, forestry work, and so on, and for that reason, I think we should be particularly careful in this year's selection.

I have in mind a man who is a very charming gentleman, a man of outstanding ability, I refer to Colonel Percy Wilson, of Spanish River.

And, therefore, I beg to move that one ballot be cast for the President, and that it be cast in favor of Colonel Wilson.

The President: I think it is probably absolutely unnecessary to put that motion before this meeting, but as a matter of form, I will ask if there are any other nominations for the presidency? If not the Chair declares the nominations closed.

Everybody in favor of the election of Mr. Percy Wilson as President for the coming year, please manifest it by saying "aye"? Opposed?

(Carried unanimously with prolonged applause.)

(President Wilson, here assumed the Chair, vacated by Mr. George Chahoon, Jr., whose term of office expired.)

The President: Mr. Retiring President, and gentlemen:

I thank you indeed for this very hearty selection of myself to this honorable position. I feel it rather keenly because I know that we are entering a year when there is a good deal to be done, and more particularly because I have to follow a man as able as the retiring president. That has been one of the chief difficulties I have encountered in thinking over this proposition, but I will do my best in this position.

There is very important work to be done. The short discussion this morning about the research work this morning is on a very very difficult and important matter. I do not think it was made particularly clear that we do need so much in this work the actual cooperation of every individual mill. Some one very happily said yesterday, or the day before, that "those who close the doors to such inquiries, close out more than they close in; they shut out more than they shut in", and that is very true, because we each have our problems and this is the great solvent of these problems.

I consider it an additional honor, gentlemen, to hold this position, because I feel that the country from which I come has, to an extent, scored a victory in this connection. Some of you may have already deduced that I am an Englishman, but I want to say that I was baptized as a true Canadian the other day when Col. Jones won some of my money at my initial game of poker. So I consider that I am now qualified, from the point of view of nationality, of holding this position.

I want to say I should have had more difficulty that I have really had, in accepting this, if I did not know that I will be able to count upon the most excellent help of all those in executive positions here, and living so far from Montreal, as I do, it struck me as being very difficult to accept such a position, but I believe, —I hardly like to say they will do the "donkey work" —but I believe they will do a great deal of the hard work in connection with this matter. I believe the Executive you will appoint will do everything to assist me in this work.

As regards Mr. Dawe and Mr. Beck: I really have to throw myself on their mercy to do all they can to help me.

Gentlemen, I thank you very much for this honor, and I invite you all to come to the luncheon in the Ball Room at one o'clock, at which General Sir Arthur Currie will speak to us.

Gentlemen, there is a little business still to be done. The election of a Vice-president. Will you kindly make the nominations for vice-president?

Mr. Bothwell: I wish to congratulate you, Mr. Wilson. There is only one gifted orator in the industry, who so ably named you for president, so it is up to some of the rest of us to do our best.

We have with us a man who has been Chairman of our most important committee for several years. He has been "through the fire" for several years. I take great pleasure in nominating Mr. George M. McKee for the vice-presidency.

The President: Gentlemen, I can hardly conceive that there are any other nominations, but are there any? If there are no other nominations, I declare Mr. McKee elected vice-president and welcome him very much in that capacity.

The Executive.

At meetings held during the convention of the various Sections, the following chairmen were elected, who together with the President and Vice-president, make up the Executive:

Newsprint Section, George Chahoon, Jr.
Woodlands Section, S. H. de Carteret.
Technical Section, George Carruthers.
Book and Writing, H. F. C. Kent.
Felt Paper Section, W. E. Walker.
Mechanical Pulp Section, L. R. Wilson.
Sulphite Pulp Section, E. L. Crookes.
Kraft Pulp Section, C. R. Whitehead.
Board Section, J. F. Taylor.

The Chairmen of the Wrapping and Coated Paper Sections will be announced later.

If your wife was as careless around the home as you are around your daily work, you'd sure be in a devil of a pickle.

News From Europe

(Special Translation for this Magazine).

Trade Disillusion in Europe.

While consumers are waiting for greater supplies of paper and cheaper markets, the mills of various countries are endeavoring to protect themselves from "invasion" by foreign manufacturers. It seems to be the cardinal doctrine of nations today that the only safe course is to shut out others from their markets. How then is commerce to be carried on? The most astonishing economic dicta fall from the pens of French writers. Thus Mr. Omer Wilhelm, Fiscal Agent of the French Embassy in Berlin, says: "The commercial relations between France and Germany are far from having resumed their normal course. Our former enemies have been obliged—as a remedy for the collapse in their exchange—to close their frontiers almost completely to imports, admitting only those materials that are destined to nourish their own industry". Then, in the course of an examination of what French industries can gain from Germany, he continues: "We, too—need it be said?—should have **patriotism** of **exchange**, and so long as our own franc has not retaken the place to which it is entitled on the money markets of the world, we should purchase only what is indispensable—namely, raw materials and the implements of labor".—La Papeterie, January 10, 1921.

A somewhat different view is expressed in Italy. The Italians, it may be noted, have in the vicissitudes of war, seldom given way to hysteria. Speaking of trade disillusions, in particular, those of the paper trade, an Italian editor says: "Now, if we Italians would draw a conclusion for our part from these two tendencies (i. e. foreign competition and home production), we should first consider that there is truth on both sides. As to the outlook for a German intervention on foreign markets, not excluding the Italian, we have not had, and probable cannot have, the early and abundant supply of paper that consumers—and in particular the consumers of print papers—had the illusion to expect; it appears that all things are not rosy in the sources of foreign supply..... And here we should put consumers on their guard against an excessive amount of confidence in paper from other countries, while inducing Italian papermakers to be vigilant, because the new trade equilibrium has not begun, or to speak more correctly, has not been systematized, an equilibrium which, without precluding the entrance of foreign products, guarantees stability to national production".—Industria della Carta, December 31, 1920. (This is certainly a sensible and business-like view).

New Papermaking Fibres in Germany.

Probably no country has spent more time on the production of fibres than Germany, and one effect of this during the past year, has been a reaction against the enthusiasm of those makers of pulp who thought in the first excitement of discovery that they had found an adequate substitute for wood or cotton cellulose. Nevertheless Germany has succeeded in produlting two fibres which have stood the test of experience. One is a fibre produced from typha by the Typha Development Co., of Charlottenburg. According to a new patent (German pat. 308,564) the fibres are bruised by hand or mechanical means, treated with strong alkalies, and finally digested in suitably diluted bisulphite liquor. Or in a new process spun fibres of high grade are made from reeds. In a still later improvement on these processes the goods after cooking are hydroextracted and dried. It is said that the fibres thus obtained are soft, easily spun, and of decided tensile strength and ability to withstand wear.

Cellulose manufactured from marsh grass (Phragmites communis) appears to be the most successful, if a judgment may be drawn from a recent article in the Papier-Fabrikant, November 12, 1920. It is to be noted that typha and reeds or rushes are terms which have been loosely applied both by technical writers and even by those who have drawn up the specifications of many of these patents. The result has often enough been failure. Certainly reeds and rushes comprise a vast number of plants, some of them worthless as paper-making materials. But the grass or rush known as Phragmites communis and also typha have produced fibres with the characters just described, and there is evidence to show that they supply a real advance in manufacture.. — (From Zeitschrift fur angewandte Chemie, December 31, 1919, of Chemisches Zentralblatt, January, 1920.

The German Paper Industry in December.

In December, as in November, the paper industry was in general able to cover its requirements in raw materials without difficulty. Yet higher prices were reached again for many materials, in particular wood and old papers. With respect to rags it must be noted that some mills, which had previously manufactured them, were unable to carry on owing to the high prices. The supply of coal continued unsatisfactory; in Saxony it failed almost wholly as a result of the miners' strike. Water power conditions were extraordinarily unfavorable, so that many of the mills driven by water power were compelled to close down. However, an improvement began during the last week of December. Auxiliary materials, though maintaining their high prices, were obtained without difficulty. There was a general complaint of the lack of transport facilities, which produced disturbance in the sensitive state of business. In consequence of the unfavorable conditions of water power, the production of wood pulp was moderate; in fact nothing in Silesia during the first three weeks of December; while in south Germany it fell off thirty per cent. On the other hand the demand for wood pulp was active, even violent. The paper market as a whole was the best in many months. But the coal shortage and the results of the Spa negotiations have a depressing influence. — Wochenblatt fur Papierfabrikation, January 15, 1921.

AMERICAN WRITING PAPER COMPANY ANNOUNCES NEW CHICAGO MANAGER.

The American Writing Paper Company announces the resignation of Mr. J. A. Lemmon who has been manager of the Chicago Office of the Company located at 1601 Otis Building, Chicago, Illinois. Mr. Lemmon has not as yet announced any further connection. The vacancy has been filled by the appointment of Mr. A. Carey Huls, formerly Manager of the Cincinnati Branch of the Eagle-A organization.—From the Editorial Department of the American Writing Paper Company, Holyoke, Mass.

Men who work with their hands, and those who find work for hands to do, should feel that the ties that bind them together are stronger than temporary day wages.—Carlyle.

British Trade News

(From Our London Correspondent).

London, Jan., 26, 1921.

There is a fight against waste going on in the United Kingdom at the present time. It is one of those re-actionary side issues developed after a system of squandermania instituted to help win the Great War and naturally the Imperial Government is coming in for a good deal of criticism. Old sores are being disturbed and irritated. Some of the critics are like vultures watching the Ministries handling their stationery and paper supplies, and when they get a chance they pounce on them through the newspapers for explanations. Since the war ended many of these Ministries have passed through vicissitudes unknown to people outside them and Departments like the Pensions' Ministry have really more work to get through than they can really handle on paper and stationery. The work is all done on paper, cardboard, and fine printing paper and the records of the millions of men wounded, not to speak of relatives, naturally form a considerable pile in the archives of the Ministry. Critics, therefore, cannot understand why the bill for stationery and paper should be greater than it was in 1913. They cannot see that the Pensions' work has increased twenty fold and they forget that paper is not sold at the same price today as it was in pre-war days. It must also be remembered that the paper is made in British mills and the money paid for it out of public funds finds its way back directly and indirectly into the Government. As a typical example of what is considered waste for a Department that has now thousand of employees, it is pointed out that the estimate of the Ministry of Pensions for stationery was £70,000 and it actually spent £169,000. This year's estimate is £5,769,104; in 1913 it was £1,237,708. The cry raised is not really over the quantity used but over the price. Then, again, if the Pensions' Department had to do the same work in 1913 as they are doing today the estimate would be nearly as big as the 1921 one—if not bigger. The Food Ministry is singled out as one of the biggest wasters among Departments, having exceeded its estimate by 600 per cent. But some people forget this Department saved England from the same fate as befell some of the children in Austria some time ago. It had to use paper to fulfill its object and the work was just as important as propaganda on paper among our enemies, the cost of which is not known yet. The Post Office and other sections of the Government also come in for criticism from a Governmental Committee and anti-wasters on the large quantities of paper and stationery consumed and their report concludes with this significant statement: "The Committee decided that M.P.'s. should again be privileged to use white envelopes in the House of Commons instead of buff envelopes." And the President of the Committee remarked: It is a matter probably of £200 a year, which is not worth talking about over a whole year. Heaven help the Department that would express itself so. Yet the chairman of the Committee engaged to cut down paper expenses in one direction help them up in another. It is a good job they are not in Canada.

Cost of Paper Production.

These investigation committees raised out of Parliamentary circles to attack subjects like paper and stationery, have no practical experience of the cost of production and neither do they know where to start cutting down without injuring the work of a department. They say you spent £1,000,000 in 1913 and we expect you to do the same or something near it in 1921—and make a department a success. From a public point of view there is also gross ignorance prevailing. I understand that the British paper manufacturers are taking up a stand against this ignorance prevailing among the public and some enlightening literature will be issued showing that with the present taxation imposed upon them, the high cost of labor and raw materials, it is impossible to reduce the cost of production and sell paper as cheap as Germany in the English market. Of late printers throughout the length and breadth of the country complain of the cost of the paper they use and the paper manufacturers are now going to open their eyes. The cost of production has lately received considerable attention. It is a big subject, particularly when Scandinavian newsprint can be bought in London for 7 cents a lb. — and sometimes 6 cents. — but the Papermakers' Association has the matter in hand and various reports are being prepared What surprises me most of all is that some statement has not been made long ago by the Association on the cost of production. It would have relieved public ignorance and shut up the mouths of those who are crying about the waste in Government Departments.

Technical.

The Technical Section of the British Papermakers' Association is progressing very favorably and great interest is being manifested in the various meetings held throughout the country. At present the membership has reached 187. At a recent meeting, in Manchester, Mr. T. D. Nuttall, whose name will be known to many Canadians for his work in the Dominion, read a paper on "Developments in Papermaking from an Engineering Point of View." He pointed out the great scope there was in the beater room and the machine department for engineers of an inventive turn of mind and he recalled the fact that in these two sections of the mill remarkable developments had been achieved. The Aberdeen members of the Section are also making great progress in the direction of technical education for the rising generation. They want Scotland placed on a par with England and Ireland in the matter of schools for technical subjects and the members in the Aberdeen district are leaving nothing to chance to fulfill their object. At recent meetings some interesting papers have been read, among them being "Recovery Processes and the Utilisation of Waste in the Paper Mill," by Capt. Allan, while Dr. MacDonald expounded "Chemical Standards in the Valuation of the Raw Materials used in Papermaking."

Works Magazines.

For sometime past I have been looking through some of the magazines or papers issued by employers to their workers. Paper agents and merchants have in some cases similar magazines. But the works magazine is an important adjunct in the life of the mill or office worker. It is solely confined to news items of interest in the mill or agent's concern. Sport, games indulged in by the employees, and holiday snapshots are recorded, as well as movements in the way of promotions. By means of the works magazine the apprentice as well as the managing-director becomes acquainted of what is going on inside the firm's sphere of activity at home and abroad. Two notable elements are recently receiving much attention. One if the wel-

fare of the workers, and the other a suggestion scheme. In the welfare scheme apprentices are educated, girls are specially provided for and the general workers as a whole are studied and encouraged to promote sick and benefit clubs, games and sports, indoor and outdor, and numerous other objects to help them socially and otherwise. In the suggestion scheme from the highest to the lowest in the firm is encouraged to make a written suggestion on anything that will tend to reduce cost of production, facilitate work and save time, keep expenses down, or improve trade. No matter what the suggestion is if it is sent in and considered worthy of adoption by the firm, a money prize is awarded. I am told the suggestion scheme is a great success in many works.

British Exports of Paper.

Of the exports from British mills in December the following were sent to Canada:—

Fine printing paper	1,078 cwts
Writing paper	4 "
Other paper	111 "

There is a falling off in the exports to Canada and the trade is nothing like what it used to be 14 or 15 years ago. On the other hand Canada enjoys a good connection with the United Kingdom in supplying pulp boards, mill boards, etc.

Business in the British paper industry is still depressed and there is a good deal of unemployment at the mills.

At present everything goints to the fact that 1921 will see a greater consumption of newsprint than heretofore. The tendency of newspaper proprietors to charge more for their papers means a slight enlargement in sizes of papers. I am informed by one firm that they are increasing their size to 16 and 18 pages and it is rumored that other London dailies will do likewise.

Canadian Boards.

During December last 9,151½ tons of strawboards reached various port in the United Kingdom from the Netherlands, Germany, U. S. A., and Belgium. Most of the supplies came from the Netherlands. The total value of these imports was £178,908. Of leather boards, 171½ tons, valued at £5,665, arrived from Sweden, Germany, Norway, and the Netherlands. Under these two headings Canada shipped nothing; but in the importation of millboards the Dominion occupied a prominent position. Out of a total importation of 2,998 tons, valued at £115,495, Canada shipped to English and Irish ports 1,017 tons 13 cwts. valued at £38,501, the remainder coming from Finland, Sweden, Germany, U.S.A. and Norway. Canada and Finland were the biggest suppliers. Cardboard and pasteboard imports in December reached 992 tons, valued at £64,250, and of this total the Dominion sent 20 tons 16 cwts. valued at £730.

The Pulp Situation.

Sellers of sulphite report enquiries being made, but business is slow owing to the dullness and depression that still prevails in the paper trade all round. Prices, however, are the same as quoted last week in the "Pulp and Paper Magazine." Some sellers feel disposed to part with groundwood a couple of points below the present quotations in order to encourage business.

Small shipments of unbleached sulphite are arriving from Canada. Most of the paper mills are well stocked with pulp.

CANADA TO MANUFACTURE HER OWN BLOTTING PAPER.

By running blotting over his machines, a manufacturer of paper has initiated the first attempt to turn out this product on a commercial scale in Canada. The credit of this project goes to the Cornwall branch of the Howard Smith Paper Mills where one machine is being devoted to the milling of blotting paper on a part time schedule. Because of the intermittent run it must not be assumed that the attempt is limited to experimentation. It is simply because the company is supplying a naturally limited demand for this product which is the outcome of a poor market. At the same time they wish to confine a portion of their output for introductory purposes. However, before the end of the last quarter of this year has elapsed it is expected to use one machine for the express purposes of producing this class of paper.

Obviously, the manufacturers are taking advantage of an unusually opportune time to produce at home what has been an imported product. Despite its reputation as a paper manufacturing country, Canada has always been dependent upon other countries with this indispensable article. But during the past few years, the price of blotting paper, like many other necessities, rose to such heights that it had to be regarded as a luxury by its buyers. Consequently, demand fell off, the manufacturers to the south of us withdrew it proportionally from the paper market, since which time the call has'nt warranted them exporting on pre war basis. But now, with an empty market, there is no reason why Canadian manufacturers should'nt be able to get a foothold therein and offset the influx of imported blotters which even in the normal coming period will be higher in price than home made ones because of duties, and the unfavorable rate of exchange that exists. It is possible that all this shall come about in a relatively short time. The raw material which goes into blotters is largely, if not entirely produced in this country. In the meantime, someone who speaks with authority points out that Sir Henry Drayton should now feel easier in view of the fact that Canada is to devote her paper interests to other than that of the newsprint industry.

NATIONAL FORESTRY PROGRAM COMMITTEE.

Remarkable interest in the matter of a national forestry policy is developing in the Middle West, and the Forestry Program Committee is working to crystalize this interest into action.

Plans are being completed for a series of addresses and conferences in and around Chicago Feb. 23 and 24, as one feature of this development. Tentative plans have now been made for Col. W. B. Greeley, chief forester of the United States, to speak on the forestry policy before the Chicago Association of Commerce, Wednesday, Feb. 23. That evening he will go to Milwaukee to address the City club, and both addresses will be based on the fact that Chicago is the greatest lumber market of the world, and that the Chicago Milwaukee district is a veritable hive of industry based on the use of wood After the Milwaukee meeting Col. Greeley returns to Chicago, where plans are being made for an Interstate Forestry Conference on Feb. 24.

Too many old men put in their last years buying stained-glass windows for churches when they should be learning to shovel coal.

UNITED STATES NOTES

The Association of American Wood Pulp Importers at a meeting held in New York City last Thursday, went on record as being opposed to any proposal to place an import duty on wood pulp. It was explained at the meeting that the domestic supply of wood pulp was almost infinitesimal, and that, if a duty be levied, the wood pulp importers would merely add it to the price to their costumers, the paper manufacturers. Approval was given to a suggestion that representatives of the Association be sent to Washington to present this view to the Ways and Means Committee of the House of Representatives. The meeting also adopted a resolution calling for the appointment of an arbitration committee of ten to settle disagreements on contracts, particularly those resulting from cancellation of orders.

K. Matsunami, a paper expert from Tokio, Japan, arrived in New York last week. He is making a tour of American paper mills seeking data on paper and pulp production and costs involved in mill construction.

Charles Kolodny, formerly with Broadway Stationery Co., Boston, Mass., is now associated with the American Envelope Company of that city, a new organization which will supply both the commercial and papeterie trade. The new envelope concern has opened a large factory on Congress Street in which it is installing the latest equipment for envelope manufacture. Mr. Kolodny is president of the company.

Following the annual meeting of the directors of the St. Regis Paper Company, held recently in New York, it was announced that Carl B. Martin, until now assistant secretary and assistant treasurer, would be advanced to the secretaryship of the company. Frank A. Empsall, formerly secretary and treasurer will retain only the latter office. It was announced also that William H. Decker, acting general manager of the company's mills, has resigned. It is expected that General Manager C. C. Burns, who has recovered from a siege of illness that had incapacitated him, will resume his duties in a short time. Outside of these changes the company's officials continue as heretofore, with Floyd L. Carlisle as president.

Bringing to a close a tenure of continuous service extending over more than twenty years, George F. Drew, of Brunswick, Me., has resigned his place with the Pejepscot Paper Company as chief engineer. Mr. Drew intends taking up the practice of general mill engineering, operating from an office at Brunswick. Besides having designed a dozen or more units and plants erected since 1898 by the Pejepscot Paper Company, installing mechanical equipment and directing general maintenance of buildings, power plants, machinery and supplies, Mr. Drew planned and supervised the erection of numerous cotton, worsted, cordage and other textile mills in the New England States.

The huge power development undertaken at Boney Falls, Wisconsin, by the Escanaba Paper Company, entailing an expenditure of $1,000,000 is reported near completion. Stockholders were told of the progress of the work at the annual meeting held last week. It was stated that by March 5 all three of the new generators at the Falls dam would be in commission so as to transmit power to the company's pulp mill at Groos Mich., where it will drive the big battery of pulp grinders. The capacity of the mill will be doubled by the improvement. A $200,000 increase in capital stock to take care of the concern's great expansion was authorized at the stockholders' meeting.

Bonds, linens and ledgers of higher grade than sulphite have experienced a drop in price in New England markets averaging 10 per cent. Commenting on the drop, which was not an unexpected one, C. A. Young, of Carter, Rice & Co., Boston, declared that no further material decline in price on this grade is likely, at least until the labor and raw material markets become re-adjusted. Other papers, in Mr. Young's opinion have reached the bottom level and will hold unless there is an unexpected radical reduction in the price of sulphite.

The committee on forest preservation of the American Paper and Pulp Association submitted a report at a meeting in the Waldorf-Astoria, New York, January 29, recommending surveys of all forest lands, improved fire protection and encouragement to owners of forest area of 850,000,000 acres had been reduced to 550,000,000 acres, the report recommended that the Government be urged to take over the lands and make them part of the national forests unless the timber land owners showed more of a disposition to grow timber on the cut-over stretches.

The Union Bag and Paper Corporation inventories at the close of 1920 were approximately $4,505,000, compared with $3,019,678 in the previous year, an increase of $1,485,322.

The Corrugated Paper Manufacturers Association, Inc., was enjoined last Thursday in a decree signed by Judge L. Hand in the Federal District Court, New York City, from advancing and fixing prices to be charged for corrugated paper boxes, which are used by manufacturers for the packing and transportation of their merchandise. Officers of the Association consented to the entering of the decree. The complaint in a Sherman Law dissolution suit, alleged that since 1916 the association and its members have fixed and established uniform prices for their products by a conspiracy to prevent competition and restrain trade through a monopoly. The Government asked for a permanent injunction.

Several paper companies have followed the lead of the American Writing Paper Company in cutting prices. American Writing Paper reduced the prices of fine papers approximately 15 per cent., to take effect immediately. It is reported that prices of bleached sulphite pulp, which is used in the manufacture of fine papers, have dropped $200 a ton to $140 a ton. Early in 1920 this grade of pulp sold as high as $220 a ton. Reductions of from 8 to 10 per cent in prices of bags and wrapping papers are now being made generally. Union Bag and Paper Company has already reduced prices about 10 per cent. The cut in fine papers, bags and wrappings is expected to result in a considerable increase in business, as many buyers have been holding off awaiting lower prices.

PULP AND PAPER NEWS

Speaking before the Hamilton Scientific Association in Hamilton, Dr. C. D. Howe, of the Faculty of Forestry, University of Toronto, stated that, of the total land area of Canada, only forty per cent is capable of bearing trees of commercial size. The total area of forest land in the Dominion is 1,900,000 square miles and only one half of this is capable of bearing trees of the saw log type—that is with trunks twelve inches and up in diameter. The remaining territory bears only small trees that can be commercialized only as to post and pole size of lumber or turned into pulpwood. Dr. Howe made a strong plea for the protection of Canadian forests against fires, which were the greatest enemy of the wooded wealth of the Dominion and said that there was little use of talking of forestry until the country had better protection against fire.

An impressive memorial service was held in Trinity Methodist Church, Toronto, when a whole-hearted tribute was paid to the memory of the late Sir William Gage, late head of the W. J. Gage company, manufacturing stationer, Toronto. Representatives of numerous public bodies were present. Rev. Newton Powell and Rev. I. Tovell paid glowing tributes to the worth and work of the deceased.

The Fort William Paper Co. who are erecting a groundwood plant at Fort William, intend increasing the capacity to 120 tons and an offering of $1,000,000, first mortgage, eight per cent serial gold bonds, is now being made for that purpose. Col. T. Gibson, of Toronto, is the president of the company.

Hon. Beniah Bowman, Minister of Lands and Forests, in an address recently before the Toronto Board of Trade a few days ago, stated that several pulp and paper companies, now owning large areas of forest, were using aeroplanes for forest fire protection work and the province intended doing something in that direction in the near future. Before the Timber Investigation Geo. H. Gray, of Sault St. Marie, who has charge of the woods operations of the Spanish River Pulp and Paper Mills, Limited, referred to experiments which were made with a hydroplane on the limits of the company last year. He said that this season they were having a hydroplane built which would carry a canoe and five men and a month's provisions. The plane would be used for cruising purposes as well as for locating fires.

Robson Black, of Ottawa, Secretary of the Canadian Forestry Association, in an address in Toronto a few days ago stated that as a filler of pay envelopes and a provider of jobs, the forests of Ontario were worth all the mines ever uncovered or likely to be uncovered. He emphasized the point that the management of public-owned forests on a basis of permanent production called for the most liberal and intelligent participation by the provincial governments. This was true if for no other reason, than that all restrictive measures aiming to promote forestry conservation, were necessarily costly to the operator. It would be quite unfair to expect individual operators to apply to their own areas a patchy system of timber cutting and reforestation, unless similar regulations were made to fit their fellow limit holders and rivals in the same market. Before any general scheme of replanting there must come a fire-proof forest.

S. R. Hart & Co., Limited, manufacturing stationers, Toronto, have removed to their new and commodious factory premises and warehouse at 489-493 King Street West, where the facilities of the company are greatly increased.

George A. Howell, of the Howell Trading Co., Toronto, has been appointed permanent campaign chairman of the Federation of Community Service, which embraces some fifty charitable and relief institutions in Toronto.

The remarkable growth of the pulp and paper industry in Canada was traced by T. Linsey Crossley in an interesting paper read before the Engineering Institute of Canada at The King Edward Hotel, Toronto. Mr. Crossley remarked that the development and maintenance of the industry called for the display of great engineering ability, offering a field for the structural, hydraulic, electrical, mechanical, chemical and forestry engineers. The average per capita consumption of paper per year was about 125 pounds in the United States and 100 pounds in Canada and the United Kingdom. The paper was illustrated by moving pictures provided through the courtesy of the Spanish River and Riordon Pulp and Paper Companies.

Iroquois Falls has a champion hockey team this year. The Abitibi boys have just defeated New Liskeard 4-2 and Haileybury 5-2. Both games were fast and well played and as they were played away from home bring the greater credit to the papermakers. While the senior team was thus engaged, the Construction team brought a victory of 3 to 2 from Cochrane.

In a brilliant nip-and-tuck overtime struggle which was not decided until the last few minutes, the Grand'-Mere hockey team defeated La Tuque in the St. Maurice Valley Hockey League at the Shawinigan Falls arena Sunday afternoon. The score was 2 to 1 and the large crowd saw one of the most fiercely contested hockey games in years. Grand'Mere has now won two games to one for La Tuque.

NEW PULP MILL AT WOLFVILLE, N.S.

Among new pulp-making organizations are the Gaspereau River Light, Heat & Power Company, Limited, who are constructing a plant for making groundwood pulp at Wolfville, Nova Scotia. The Company expect to commence manufacturing very soon with an initial force of about twenty-five employes. Their mill will be equipped with one 30-inch grinder having a capacity from eight to ten tons of dry pulp a day. C. H. Wright is president of the Gaspereau River Company, and R. A. Godrey is secretary.

Technical Section

JOURNALS ABSTRACTED.

The following summary gives the list of periodicals regularly abstracted for the Technical Section and the T. A. P. P. I. Any suggestions or helpful criticisms will be appreciated.

Forestry Journals, by Mr. Clyde Leavitt.

English Journals, by Miss Collins.
- World's Paper Trade Review.
- Papermaker & British Paper Trade Journal.
- Papermaking.
- Papermakers' Monthly Journal.
- China Clay Trade Review.
- The Paper Container.

French and Chemical Journals, by Mr. A. P. Couture.
- Le Papier.
- La Papeterie.
- La Revue Universelle de La Papeterie.
- Bulletin du Syndicat des Fabricants de Papier et Carton de France.
- Chimie & Industrie.
- Canadian Chemical Journal.
- Journal of Industrial & Engineering Chemistry.
- Journal of the American Chemical Society.
- Journal of the Society of Chemical Industry.
- Paper.
- French Patents.
- Canadian Patent Office Record.
- Pulp and Paper Magazine.
- Chemical & Metallurgical Engineering.

American and German Journals, by Mr. C. J. West.
- Paper Trade Journal.
- Paper Mill.
- United States Paper Maker.
- Fibre Containers.
- The Paper Maker.
- Paper Industry.
- German Patents.
- Chemical Abstracts (Only such articles as are not listed under "Pulp & Paper" but which may be of interest to the Trade).
- Papier Fabrikant.
- Papier-Zeitung.
- Wochenblatt für Papierfabrikation.
- United States Patents.
- Journal of the Royal Society of Arts.
- Consular Reports.
- Proceedings of the American Society for Testing Materials.
- English Patents.

BOOK REVIEW.

PAPER AND ITS USES. — A treatise for printers, stationers and others. By Edward A. Dawe, Assistant Examiner of Paper, H. M. Stationery Office. 2nd Edition. London: Crosby Lockwood and Son, 1919. 162 pp. 26 figures. 35 samples of paper.

This little volume is an attempt to present a concise yet comprehensive treatise on the manufacture and uses of paper, which shall be intelligible to the student and to the printer and stationer, in the hope that it may be sufficiently progressive to lead to the study of the larger works on papermaking. We therefore, expect to find the chapters on raw materials, manufacture, etc. treated in an elementary and somewhat popular way. The man who desires general knowledge of the process will find just enough information here. The real student of papermaking will want much more than Dawe gives, and will, if he reads this book, be able to read Cross and Bevan or Witham much more easily and intelligently. The papermaker, however, will find much information in the last chapters (Defects and Remedies, and the Right Paper) which will give him a more sympathetic understanding of the requirements of the printing trades. They also will give the printer an idea of the various kinds of paper to be used for different kinds of work, and if carefully studied, should prevent many unjust criticisms of the papermaker. Obviously the best "job" can be secured only when there is a carefully controlled manufacturing condition and an intelligent selection of paper on the part of the printer. Thus the choice of tub-sized or engine-sized is often one of importance, since the tub-sized papers may develop an unpleasant smell which will not occur in engine sized papers. In the covering of straw boards, box boards or mill boards with colored papers, freshly prepared paste or glue should be adopted since old preparations may become acid and cause a change in color in the paper, a result that cannot be blamed upon the manufacturer.

A few simple directions are given for paper testing, but more detailed directions would be necessary for successful results.

The last chapter contains an alphabetical list of papers (22 pages) with a brief statement of the composition, method of manufacture and uses. There one may learn that Long Elephants are used by wall paper printers, that O. W. papers are specially prepared rag papers for water color drawings, that Porcelain papers are of the nature of celluloid, made of well beaten pulp and are used for Christmas cards, that Silurian Papers are grey papers mottled with blue fibers, etc., etc. The 35 samples show the various types of paper used by the printing trade, and give a description, the ream weight and approximate furnish. The sizes, terms, etc., apply, of course, especially to English practice.

CLARENCE JAY WEST.
ARTHUR D. LITTLE, Inc.

REVIEW OF RECENT LITERATURE.

A-15. Resistance of fabrics to climatic conditions and to ultra-violet rays. L. VIGNON. Comptes Rend., **170**, 1322-4, (1920). J. Soc. Chem. Ind., **39**, 481A, (July 15, 1920). The results of experiments indicated that the tissues of animal origin (chappe silk) are more resistant than those of vegetable origin (linen) to variations in climatic conditions and to the action of ultra-violet rays, the probable explanation being that the protein molecule is more resistant to hydrolysis than the cellulose molecule.—A. P.-C.

A-15. Catalytic action in the oxidation of cellulose. L. P. WILSON, J. Soc. Chem. Ind., **39**, 177T, (July 15, 1920). The viscosity of cellulose xanthate solution (viscose) for the manufacture of artificial cellulose fibers depends largely on the exact amount of oxidizing action to which the alkali cellulose is submitted. The oxidation may be carried out either by exposure to the atmosphere or by treatment by chemical means, e.g., peroxides or hypochlorites In either case the process can be greatly accelerated by the use of suitable catalysts. These catalysts are generally oxides or hydroxides of metals which exist in 2 states of oxidation, e.g., Fe, Ni, Co, Ce, V, Mn.—A. P.-C.

A-15. The composition of cellulose. HENRY ALDOUS BROMLEY. Brit. Paper Trade, J.; Paper, 20, 22 (July 14, 1920). A very brief review of some of the most important chemical properties of cellulose.—A. P.-C.

A-15. Lignin and reactions of lignin. P. KLASON. Ber., **53**, 706-11, J. Soc. Chem. Ind., **39**, 482A, (July 15, 1920). See also Paper, 20, 36, 38, (June 30, 1920). The naphthylamine ligninsulponate described previously (see J. Soc. Chem. Ind., **38**, 570A, 1919). has been investigated further. Its formation is considered to indicate the presence of the group R.CH:CH.CHO in lignin. It is formed in greater quantity from old than from fresh sulfite liquor and it would appear that the group $CHR{:}CH.CH_2OH$ is present in the latter, and that the aldehyde, in part, at any rate, is gradually formed in them by atmospheric oxidation. It is concluded that coniferyl aldehyde and coniferyl alcohol are the principal constituent groups at any rate of the lignin of conifers.—A. P.-C.

A-15, Direct estimation of lignin in cellulosic materials. E. BECKER, Papierfabr., **17**, 1325-7, (1919); Chem. Zentr., **91, 11**, 347, (1920); J. Soc. Chem. Ind., **39**, 482A, (July 15, 1920). 1 g. of the finely divided material is mixed with 10-20 cc of 72 per cent H_2SO_4 by means of a glass rod. When the mass becomes gelatinous a further 80-100 cc of 72 per cent H_2SO_4 is added and the mixture allowed to stand for 24 hours. It is then diluted with 1-1½ parts of water, passed through a Gooch filter, washed with hot water dried to const. wt., ignited, and weighed the difference between the 2 wts. give the amount of ash-free lignin.—A. P.-C.

A-15. Certain aspects of the chemistry of cellulose from the colloidal viewpoint. GUSTAVUS J. ESSELEN Jr. J. Ind. & Eng. Chem. **12**, 801-3, (1920). It is pointed out that it is not unreasonable to expect that when ethyl or methyl alcohol is added to a $CHCl_3$ solution of cellulose acetate the alcohol is absorbed by the colloidal cellulose acetate, the OH groups probably being nearest the surface of the cellulose acetate particles. The resulting improvement in solubility which occurs may then be explained as due to a combination of 2 effects: 1st, a swelling and possible increase in the degree of dispersion of the cellulose acetate; 2nd, a greater attraction for the $CHCl_3$ by the simple hydrocarbon radicle of the alcohol than by the more complex cellulose acetate. The theory is extended to explain the solubility of cellulose acetate in mixtures of alcohol and C_6H_6 and in phenols, which as a class, are excellent solvents for cellulose acetate. The action of such solvents as AcOH, ethyl acetate, and triacetin, which contain acetyl groups, is to be explained on the ground that they are presumably of the same general type as cellulose acetate. It is recognized that there are still other solvents of cellulose acetate which are not included in either of the above general divisions, and it is hoped that a correlation can later be made of many of the observed phenomena in these instances also.—A. P.-C.

RECENT PATENTS.

K-18. Machine for making plaster board. U.S. patent No. 1,349,777, JOHN F. MAKOWSKI, San Francisco, Cal. Paper, 27, No. 8, 26-8, (Oct. 27, 1920). —A.P.-C.

K-19. Machine for waxing, coating, or impregnating paper and the like. Br. patent No. 124,717, W. MAYER U.S.A. Chimie & Industrie, **4**, 516, (Oct. 1920).—A.P.-C.

K-20. Manufacture of parchment paper. Ger. patent No. 303,266, P. HOERING, Sept. 1, 1916. J. Soc. Chem. Ind., **39**, 653A, (Oct. 15, 1920) The leaves, or stalks, or both, of the reed made are subjected to the action of caustic alkalis under press., and the product after washing is employed as paper pulp without any special beating and without sizing. The material consists of bast fibers and parenchyma, furnishes a transparent, grease-proof paper of a brownish-yellow color. —A.P.-C.

K-23. Process and machine for obtaining a marbled effect on paper. Fr. patent No. 506,862. G. L. M. LABATIE, (Seine), France. Papeterie, **42**, 877-8, (10 Oct. 1920). The invention covers a process and a machine for making marbled paper continuously so as to give it the same aspect as paper marbled by hand. Adhesive is poured on the upper length of an endless belt having slightly raised edges and passing over rolls. Drops of color are produced mechanically on the surface of the adhesive and the paper is unwound from a roll and passed over the layer of adhesive so as to receive the required impression.—A.P.-C.

K-23. Artificial fuel. Br. patent No. 124,310, L. GRIMANI, England. Chimie & Industrie, **4**, 480, (Oct. 1920). An easily handled fuel is obtained by coating strips of paper with paraffin. They are then made into bundles, subjected to a very high press., and cut into blocks which can then be coated with resins, paraffin or gums.—A.P.-C.

L-5. Manufacture of cellulose acetates. Eng. patent No. 139,232, J. O. ZDANOWICH, Sept. 18, 1918. J. Soc. Chem. Ind., **39**, 483A, (July 15, 1920). The substitution of org. acids, particularly mono—, di—, and trichloroacetic acids, for H_2SO_4 has not given satisfactory results on acct. of their being weak acids. If, however, the chloroacetic acids are employed in the nascent state by adding a halogen to the acetylating mixt., they react more energetically, even at a low temp., and have no injurious effect on the cellulose mol. even at high temp. After the production of the more —and di-acetate of cellulose the esterification of the cellulose is too slow, but the addition of a small amt. of H_2SO_4 or other strong condensing agent readily completes the esterification, the cellulose passing into a clear colorless soln. of extreme viscosity. This soln. may be used directly for the production of films, artificial silk, horsehair, etc. The material pptd. in the usual way forms a transparent glass-like, tenacious material, and is sol. in $CHCl_3$ or acetone.—A.P.-C.

L-5. Cellulose esters. Br. patent No. 145,524-1919. Akt. Ges. für Anilin Fabrikation, Treptow, Berlin, Sept. 1, 1920. Chem. Met. Eng., **23**, 1036, (Nov. 24, 1920). Cellulose esters are prepared by subjecting to the usual processes of esterification a cellulose derivative obtained on treating cellulose with nitric acid in the presence of benzene.—A.P.-C.

L-5. Cellulose acetate. Br. patent No. 145,511-1919, Badische Anilin und Soda-fabrik, Ludwigshafen-on-Rhine, Sept. 1, 1920. Chem. Met. Eng., **23,** 989, (Nov. 17, 1920). Cellulose acetate sol. in acetone is dissolved in a fully hydrogenized monocyclic ketone such as cyclohexanone, to form solutions suitable for lacquering and for the production of artificial silk and films. A solvent or diluent, e.g., alcohol, acetone, ethyl acetate, or benzene, may be added to the ketone.—A.P.-C.

L.-5. Cellulose acetate compositions. Br. patent No. 146,212, British Cellulose and Chemical Manufacturing Co., London, Sept. 8, 1920. Chem. Met. Eng., **23,** 1036, (Nov. 24, 1920). A compn. for use as a coating material, or in the manuf. of artificial silk or films, or as a varnish, and which can be cast or molded, consists of cellulose acetate and the aggregate of fatty acids extd. from coconut oil. A volatile solvent such as $CHCl_3$, acetone, acetylene tetrachloride, or $CHCl_3$ and EtOH, is used in the manuf. of the compn.; and the proportions of solvent and of fatty acid are varied according to the purpose for which the compn. is to be employed.—A.P.-C.

L-5. Acetylcellulose and process of making same. U. S. patent No. 1,338,661, W. G. LINDSAY, Assignor to the Celluloid Co., April 27, 1920. J. Soc. Chem. Ind., **39,** 445A, (1920). Cellulose is impregnated with alcohol and benzene and then acetylated with a mixt. of acetic anhydride and benzene.—A.P.-C.

L-5. Preparation of a gutta-percha substitute from acetylcellulose resistant to alcohol. Ger. patent No. 317,145, O. SKALLER, Nov. 13, 1918. J. Soc. Chem. Ind., **39,** 445A, (1920). If a film obtained from acetylcellulose solns. be immersed for a short time in concd. alcohol, and then dried in air, it becomes quite insensitive to alcohol.—A.P.-C.

L-5. Preparation of material capable of nitration from wood cellulose. Ger. patent No. 300,069, C. CLAESSEN, Berlin, July 29, 1915. J. Soc. Chem. Ind., **39,** 429A, (1920). The dried pulp is rolled or pressed and the compressed material reduced to a fine state of division by a suitable wood-working machine. A uniform porous substance is obtained which can be nitrated in the usual way.—A.P.-C.

L-7. Treatment of artificial silk and staple fibers. Ger. patent No. 322,141, A. LAUFFS, Dec. 3, 1918. J. Soc. Chem. Ind., **39,** 686A, (Oct. 30, 1920). If suitable organic substances such as sugars, glycerol, and sol. starch be added to the water used for precipitating the fibers, the harmful effects of any CaO still present (most of the CaO is removed by a preliminary treatment of the water) is much diminished, and especially in dyeing, much more even results are obtained.—A.P.-C.

L-7. Cuprammonia cellulose solutions; artificial threads. Br. patent No. 145,035-1919, Glanzfarben Akt. Ges., Petersdorf, Germany, Aug. 18, 1920. Chem. Met. Eng., **23,** 941, (Nov. 10, 1920). Solns. of cuprammonia cellulose, which are permanent and capable of being satisfactorily spun, are obtained by the addition of sugars both of the grape-sugar group and of the cane-sugar group; the former are added to prevent oxidation of the cupric salt and of the cellulose, and an amount of 0.25 p.c. of the cellulose taken is sufficient; the sugars of the cane sugar group, of which refined beet sugar is the most suitable, are added to effect or maintain the hydration of the cellulose, and of these sugars it is sufficient to add 2 p.c. of the wt. of the cellulose taken, or a little more if the cellulose has not been decomposed. By the addition of a reducing sugar, it is stated that the solubility of CuO in NH_3 is increased, and the soln. of the cellulose in such soln. is rendered more rapid and complete.—A.P.-C.

L-7. Production of artificial fibers from cellulose solutions. Ger. patent No. 322,538, K. SCHREINER, Dec. 25, 1917. J. Soc. Chem. Ind., **39,** 719A, (Nov. 15, 1920). The method of producing fine threads by drawing out thick threads spun from wide orifices, is applied to cuprammonium cellulose solns. with the aid of slowly acting gaseous precipitants. After use the gases are passed into a well-cooled tubular vessel in which the moisture is deposited and the greater part of the NH_3 is absorbed; after being moistened and reheated the gases are used again to extract NH_3 from the threads. —A.P.-C.

L-7. Production of textile fibers from wood. L. ENGE; Ger. patents. No. (A) 302,424, March 13, 1917, (B) 303,293, June 24, 1917, (C) 304,313, June 26, 1917, (D) 304,312, Sept. 2, 1917. J. Soc. Chem. Ind., **39,** 444A, (1920). (A) By various methods, such as treatment with alkalis and then acids, or vice versa, followed by digestion in a closed vessel with a soln. of a neutral salt, a kind of half cellulose can be obtained from wood. Wooden logs and planks thus treated may then be mechonically disintegrated in a moist state, and further treated to obtain textile fibers. If they are heated under press. these are especially strong and light colored. (B) Pieces of wood not thicker than 1 mm. can be used instead of logs, and the chem. treatment is omitted. (C) The treatment of the wood before digestion can be varied. The acid and alkali treatment may be repaced wholly or partly by treatment with hydrocarbons, such as benzol, petroleum, naphtha, and gasoline, or by solns. of Na_2SO_3, NaCl, $MgSO_4$, etc., which do not readily dissolve lignin. The wood may be first heated with alkalis and then treated with argilloceous earth in AcOH or H_2SO_4. After one or other of the various treatments above mentioned the wood may be impregnated with oils and fats or solns. of metallic salts etc. (D) The bark bast of coniferous woods can be treated by the methods described under (A) or (C) or by gentle heating with dil. acid or alkaline solns., and is dried, moistened or oiled, and then carded. Bast fibers may also be obtained from branches. The carding operation demands that the fibers be evenly moistened or oiled to prevent breakage. Bast fibers are finer than those from the wood itself.—A.P.-C.

L-7. Waterproofing and hardening cellulose and its products. Br. patent No. 145, 611-1919, F. MOELLER, Cassel, Germany, Sept. 1, 1920. Chem. Met. Eng., **23,** 990, (Nov. 17, 1920) The process described in Br. patent No. 145,610-1919 may be applied to the treatment of vegetable matter containing cellulose such as wood, cork, straw, jute, hemp, linen, flax, artificial silk, yarns and fabrics obtained therefrom, cellulose derivatives such as cellulose hydrate, hydrocellulose, oxycellulose, kindred substances such as starch, dextrine, or fabrics and substances treated or impregnated therewith. These materials may also be hardened and rendered less sensitive to water by treatment with sulphur chloride, the deposited S being subsequently removed by a suitable S solvent. The products of this treatment may be parchmented and the fat-resisting material so obtained rendered water-repellent by further treatment with thionyl chloride.—A.P.-C.

The Markets

CANADIAN TRADE CONDITIONS

Toronto, Feb. 5.—Reductions in a few lines of paper and increased activity in manufacture and sales characterized the pulp and paper market this week. Dealers report that there has been a decided picking up in business. There have been considerably more sales than for some weeks past and enquiries are beginning to come in on something like the old basis as to number. Some wholesalers report having done more business during the past ten days than during the whole of January, particularly in the coarse grades of paper and toilet and tissue lines. While trade is a little quiet in book and writing papers there are signs of improving conditions and the outlook generally for a good trade during the spring is bright. Speculation as to likely price levels is still rife, some paper dealers declaring that quotations will not go any lower and that they are already down to rock bottom, considering the cost of manufacture, including the maintenance of the wage schedules. It is declared, too, that if papers were offered at half their present value, it would not stimulate trade any more. A certain element would still hold back and want it for less. It would appear as if necessity were the only element that would compel them to purchase. It is argued on the other hand that the mills must have more business, having now caught up with orders, and that more price reductions will follow. At the present time there is a tendency to sane buying and an evident disposition on the part of the trade to get back to normal and stable conditions as quickly as possible. That object is steadily being achieved.

SOME LINES DOWN.—Coated papers have dropped half a cent, sulphite bonds from four to six cents, book papers from two to three cents and writing papers about the same, since the first of the year. Vat-lined board is now quoted at seventy-five dollars per ton and filled wood board at one hundred dollars, being a reduction of fifteen per cent. Customers who today place orders for paper boxes can get quick delivery. During the past week there has been a decline of two cents on tag manila which is now quoted to jobbers at nine and a half cents. Bristols fell from one to two cents and quotations range from thirteen to twenty-three cents per pound. Some plants are making up stock lines which have been allowed to run low.

WRAPPING PAPERS.—Wrapping paper demand is improving from week to week and dealers and consumers are now coming into the field with fair-sized orders. Both mill and job travellers report that more and better-sized orders are being received and that the trade has brightened considerably. The lowering of prices on manilas has given an impetus to trade. Kraft is in fair demand and is improving in this respect. Several of the plants which were closed down for a time have announced that they will resume operations towards the end of the month, stocks having been considerably reduced in the meanwhile.

PAPER BOX BUSINESS—Manufacturers are rather quiet but there is nothing particularly gloomy in the outlook. On the other hand a livening up of business is predicted for the near future and there are already signs of its approach. There have been substantial reductions in the prices of the finished product owing to the decrease in board prices. Chip and straw board are selling at sixty dollars a ton. The new ground wood pulp plant of the Canada Paper board Co., at Frankford, is now in operation.

TOILETS AND TISSUES.—The recent drop of ten per cent in these lines has had the effect of greatly stimulating the trade and fairly good volume of business is being done. The approach of spring is expected to add an impetus to the trade in light weight papers and optimism prevails among the jobbers and manufacturers.

BOOK PAPERS.—The book paper mills are not operating at full capacity and some of the manufacturers say they are not anxious to enter into contracts with the publishers until the cost of raw material becomes more settled and they know "where they are at." One leading manufacturer remarked that there was very little use entering into a hard and fast contract for, if prices went down, publishers would naturally object to paying the contract prices. He said that his firm had reduced prices somewhat and there was a disposition on the part of consumers to pay a little more than they first thought they should and he thought that any differences there were would be amicably settled. He pointed out the danger, however, of large consumers, department stores, banks and other institutions holding aloof much longer, as, when they do enter the market there was likely to be a shortage and cause a rise in prices. The mills can take care of their needs at present but when the demand increases there was a possibility of the inevitable happening in the way of increased prices.

PULP.—Stocks in most cases are heavy and there is a disposition to cut prices as a consequence. The mills are not producing anything like their capacity output. Groundwood pulp is being offered all the way from $65 to $75 per ton. Bleached sulphite is quoted at from $140 to $160 per ton and easy bleaching from $110 to $115. The market for kraft pulp is rather slow and prices range from $100 to $125. It is expected that there will be an improvement in the demand for all kinds of pulp in the near future as business with a number of paper mills improves.

A slight improvement in the trade is noted by many Montreal representatives of the Pulp and Paper Industry.

An increased local demand of wrapping paper is noted by a Montreal jobbing firm. The same firm states the trade in jute is very quiet although picking up slightly in the country districts.

Prices in some lines of the paper and allied industries have dropped a little —i.e. some lines of printing papers, jute, boards and bristols.

The export trade continues to be dull.

Patience with other people's faults is a duty. It is patience with our own shortcomings that counts against us.—Rochfoucauld.

NEW YORK MARKETS.

New York, February 5—(Special Correspondence).—Developments in the paper market show conclusively that prices on various grades of paper are being rapidly readjusted to more normal levels where there is every likelihood that demand will expand, thus making for a livelier market than has existed in recent months. Paper manufacturers are following the policy of producers of numerous other commodities and are reducing quotations sharply, evidently feeling that this procedure is the quickest way in which to restore confidence among buyers and to induce consumers to increase their purchasing.

The most important and significant development of the week in this connection is a reduction in prices of its products on an average of 15 per cent by the American Writing Paper Company, effective immediately. In making the announcement of the cut in prices, the company issued a statement which said, and which, incidentally, gives a very clear insight into the views taken by paper manufacturers on the present price situation:

"Manufacturing cost of both bleached sulphite pulp mills and of mills making fine papers do not warrant the reductions we list. Readjustments are made to meet the almost universal sentiment among consumers of papers and the printing trades, reinforced by advices of mercantile friends that so-called readjustments would restore confidence in the paper industry and bring a stable and active market within the shortest possible time. Since coming to the decision to yield to these importunities, the situation has been appreciated likewise by several pulp mills, many paper mills and merchants generally, and improvements in the manufacturing situation are already in evidence."

There appears scant doubt that the action of papermakers in lowering prices will result in bringing more buyers into view, because it is generally recognized that numerous users of paper have purposely held back in buying while believing that paper prices had to come down along with those on other commodities. It is felt throughout the trade that with prices on practically all kinds of paper and paper board getting down to levels where they are more in keeping with normal times that consumers will increase their buying operations, and although the market has not shown concrete effects of the price reductions just yet, there are plenty of signs that broader activity is not far off.

According to authoritative information, some book paper mills have further cut prices. It is stated that machine finished book paper is to be had down to 10 cents a pound f.o.b. mills in certain quarters, while this same grade of paper is available to contract buyers at 8 to 8.50 cents. As previously pointed out in this report, book paper manufacturers are in a fairly satisfactory position. Most of them have enough contract business to keep them engaged a greater part of the time but practically all of them are running on curtailed schedule. Apparently they hope by reducing prices to stimulate demand to an extent where they can obtain sufficient orders to operate their plants at full capacity. One only has to glance over an issue of any popular periodical these days and compare it with an issue of two or three months ago of the same publication to realize the tremendous drop in consumption of book paper in the interim. The reason for this of course is the falling off of advertising, but when business conditions generally improve it stands to reason advertising will pick up because manufacturers and merchants will necessarily have to exert additional effort and do more publicity work in the future to obtain business than they have during the war period, which should in turn increase the consumption of book paper.

The newsprint market continues to display a fairly easy tone. There seems little question that newsprint for spot delivery is coming into the market in excess of requirements, and prices obviously are affected. Spot news in standard rolls is being offered in some quarters down to 6.25 cents a pound at mills, and there have been reports of imported newsprint being available at even cheaper prices. Demand for spot print paper is narrow, due to the fact that publishers are managing to make contract supplies cover their requirements for the present. No change has occurred in the contract basis, which is maintained by the principal producers at 6.50 cents per pound at mills, although there is much speculation in the trade regarding the price which the leading manufacturing company is likely to fix for deliveries over the second quarter of the year.

Wrappings and tissues continue in light demand. There is nothing more than routine business in jute wrapping papers, and even the more popular kraft is moving in but small quantities at a quotable basis of about 9 cents a pound f.o.b. mills. No. 1 white tissues are quoted at $1.75 a ream.

The low grades of paper board are meeting with moderate demand. Plain chip is sought in relatively larger volume than any other kind of board and is bringing between $45 and $50 per ton at mills, with a majority of manufacturers naming the higher price. News board is quoted at $50 to $55.

GROUND WOOD.—The mechanical wood pulp market is in a very unsettled condition. Few buyers are in view, and so many prices are reported that it is next to impossible to determine what actual values are. It is known that domestic producers in some cases are offering ground wood for prompt delivery down to $65 a ton, and there have been rumor that odd lots of small tonnage have been sold at as low as $50 at mills. The probabilities are the market will lack a definitely established basis until consumers resume buying in something resembling normal fashion, because matters are such now that some sellers are holding firm for high prices while others are seeking to dispose of pulp at whatever they can realize on it.

CHEMICAL PULP.—Demand for chemical wood pulps is narrow, so narrow, in fact, that the market is characterized by little or no activity. Paper manufacturers generally claim to have present requirements taken care of, and doubtless partly because of the downtrend in prices, are mostly indisposed to buy excepting of course when pressed by necessity. Quotations are irregular and prevail on a wide range. As a matter of fact, quotations mean little today for the reason that buyers invariably can secure the pulp desired at substantial reductions from the prices asked. Most members of the producing and distributing trade are simply marking time, feeling that to endeavor to market pulp at this time would only result in further weakening conditions against themselves, and believing that within the course of a few weeks longer demand for pulp will revive.

Imports of pulp at the port of New York this week included 900 bales and 762,000 kilos from Gothenburg, and 300 bales from Kobe.

RAGS.—While there is a fair call for some grades of old papermaking rags, the market as a whole continues in the throes of a dull spell, and the aggregate movement into consuming channels is of little consequence. Buyers are absorbing moderate amounts of roofing stock and of old white rags, and these rule steady in price, but new cuttings are neglected and quotations on such grades are sloping off. Offerings to mills have been reported of No. 1 white shirt cuttings at 17.50 cents a pound at shipping points, of fancy shirt cuttings at 8.75 cents, of unbleached muslin cuttings at 13.50 cents, of white lawns at 15 cents, of new blue overall cuttings at 9 cents and of No. 1 washables at 7.50 cents. and few buyers have been attracted by these prices. Roofing rags are moving to felt mills at a cent per pound, or slightly higher, at shipping points for No. 1 packing. Old No. 1 repacked whites are quoted at between 9 and 9.50 cents, and old repacked thirds and blues at 3 to 3.25 cents.

PAPER STOCK.—There is a divided state of affairs in the old paper market. High grades are scarcely wanted by consumers and are tending off in price, whereas low qualities are moving in fairly good volume and are holding quotably steady. No. 1 mixed paper leads in demand and is fetching 50 to 55 cents per hundred pounds f.o.b. New York, and folded newspapers meet with a fair demand at 65 to 70 cents at shipping points. There is also moderate activity in white news cuttings at 2.75 to 3 cents a pound and in container manilas at 60 to 65 cents. Shavings, on the other hand, are lower, with offerings of No. 1 hard whiteno ted at 5 cents a pound, and a shade less, and of No. 1 soft white shavings at 4 cents. The pulp situation undoubtedly accounts for the light call for high-grade paper stock and conditions at consuming plants must necessarily improve before waste papers are likely to be sought in increased amounts.

OLD BAGGING AND ROPE.—Paper manufacturers are occasionally coming into the market to absorb small parcels of old rope and are paying around 4 cents a pound for manila rope in No. 1 condition. There is, however, not enough demand to sustain values and quotations are tending lower. Old bagging is in a dormant condition and buyers are enabled to get stock at very nearly their own figures. Offerings of No. 1 scrap bagging at 1.75 cents a pound and of roofing bagging at 75 cents per hundred pounds meet with few takers.

Lagerloef Trading Company Inc., 18 East 41st Street, New York City, have found it necessary, owing to their rapidly increasing business in the West, to open an office at 1932 Conway Building, Chicago. Mr. Robert D. Krudener is the manager. They extend a cordial invitation to any of their friends to visit this office whenever they are in that city.

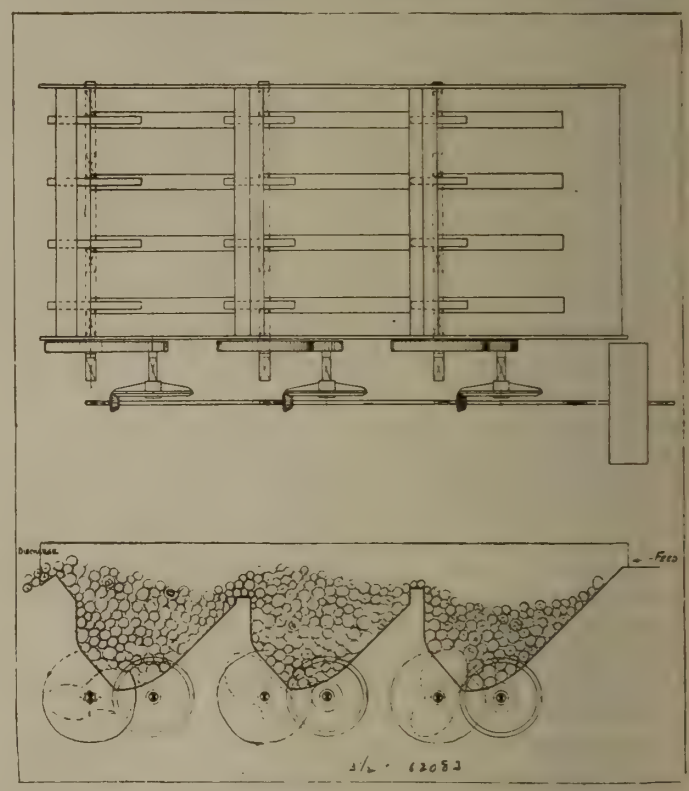
The firm of **Daniel M. Hicks, Inc.,** 200 Fifth Avenue, New York City celebrated its twenty-fifth anniversary last month. The business was started in December 1895 by the late Daniel M. Hicks who, previous to establishing his own firm, was for more than twenty years in the paper stock trade. The present firm, which are dealers in and importers of paper mill supplies is in charge of his three sons.

INDUSTRIAL ITEMS.

Thorne Barking System.

During the past few years the continued advance in the cost of pulp wood has concentrated the attention of pulp mill engineers on the wide field for economy in the preparation of logs for the mill. The introduction of the drum type of barker was a step in advance of the old methods of mechanical knife barking but still left much to be desired. The waste of wood in sawdust due to the necessity of slashing the logs into short lengths before they could be introduced into the drums and the loss from the broomed ends, is a very appreciable item in the cost of pulp manufacture. This problem was studied in all its phases by Mr. C. B. Thorne, Technical Director of the Riordon Company Ltd., makers of high grade sulphite pulp, and in 1918 his first barker was developed, built and operated commercially at the Hawkesbury mill. At the present time all the wood at the mill is being barked by this method.

At the Temiskaming mill of the Riordon Company Limited, three of his units are installed, handling logs in sixteen foot lengths and others are in the course of



design, so that the barking capacity next season will be sufficient to handle one and a half million sixteen-foot logs per month. In developing this new method of barking, Mr. Thorne had the following purpose:

To eliminate, as far as possible, manual handling of the logs from the time they are placed on the haul-up until they are delivered to the chippers.

To abolish slashing and avoid the needless loss in sawdust.

To bark the logs clean without loss of pulp wood and at the same time avoid brooming the ends.

It was also desired to stock-pile the logs in such a way that the maximum drying effect could be obtained. The fact that the logs are not slashed before barking permits them to be easily mechanically stacked in ranked piles by means of locomotive cranes and grapples, thus allowing a free circulating of air through



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the piles and thorough evaporation of excess moisture.

The logs are reclaimed from the piling ground without the aid of manual labor in the same manner and are slashed into eight foot lengths before feeding to the chippers. This slashing is only done to aid in culling rotten hearts. A marked economy in high percentage of good chips is effected due to feeding long lengths into the chippers.

The principle of the barker is illustrated in the cut.

The machine consist of three trough-shaped pockets made of steel plate. For sixteen-foot logs, the troughs are eighteen feet long and have parallel perpendicular ends. In the bottom of the pockets are slots through which the wings of the double ended cams act on the logs to give them a rolling and rubbing action on each other, which effectively removes the bark. A heavy spray of water is played on the logs in the pockets which washes the loose bark out of the machine through the cam slots into troughs below, which carry it away.

The logs are introduced into the feed end of the machine by chain conveyors, the logs travelling sideways. The details of the necessary conveyors have been perfected to distribute the logs automatically from the top of the haul-up into transfer conveyors conveying the logs in a direction at right angles to the haul-up chains for distribution to a series of barkers side by side and from the transfer conveyors to the feed conveyors where their direction of motion is again changed back to that which obtains on the haul-up.

The pockets are fed continually and the logs discharge themselves from the lip of the last pocket at the same rate as fed. The cams, four to each pocket, are steel castings and so designed that the line of force on the logs is normal to the cam face at all parts of the lift. The cams are of the two-wing type about six feet in diameter over the tips of the wings and are driven at a speed of fifteen revolutions per minute by means of cut steel gears from a main line shaft at right angles to the cam shafts. The cams working in any one pocket are all set in line in order to act together to lift the logs to impart the rolling motion, but are set sixty degrees apart in the three pockets relatively to each other in order to equalize the turning effort on the driving motor.

Pockets have been constructed with grids in the ends to permit observation of the cam action on the logs and a close study of this assisted materially in perfecting the machine and developing its large capacity. The peculiar rolling action given to each individual log in the pocket regardless of whether it is actually in contact with the cam or not during the period of lift is responsible for the rapidity with which the bark is actually rubbed off without damaging the log iself and was not attained without trial of many combinations of shapes of pockets and cams and rates of cam speed, both on the actual machine and on small models.

There is, of course, a tendency for some logs to remain in the pockets longer than others, but by feeding at the normal capacity of the machine the percentage of overbarked logs is negligible and those which are discharged before being fully barked are dropped through a gap in the conveyor carrying them from the barkers to the log cars and returned by means of another conveyor to the feed end for another passage through the machine.

The barkers at the Temiskaming mill have been fed at the rate of fifteen cords of wood per hour each with an input to the motor driving each unit of one hundred and seventy-five horse power. The ultimate capacity of the machines themselves has not yet been determined as feeding rates have been governed by limited transportation facilities between this battery of barkers and the log piling ground, the project still being in the construction stage.

A feature of considerable importance is the exceptionally low maintenance cost on a machine of this type. The only moving parts being the shafts, cams and gears. The pockets so far have been made of thick plate supported by heavy timber framing well bolted together. Additional permanence will be given to future machines by making the frames of reinforced concrete. The cam shafts are steel forgings eight inches in diameter with a babbitted bearing close to each cam. The main line shaft and machine cut cast steel gears are liberally proportioned and all bearings are of the collar oiling type, bolted to steel yokes imbedded in the concrete foundation walls. Every effort has been made to make the mechanical parts both efficient and rugged.

The operation of the Thorne barkers at the Temiskaming mill has been studied by many prominent pulp men during the past few months and their opinion has been unanimous that Mr. Thorne has succeeded in developing a method of barking which will revolutionize wood handling practice.

The Canadian Allis-Chalmers Co. Ltd., have been given the selling rights for the Thorne barking system for Canada and Newfoundland.

The business of **M. G. Tibbits** and **Trimbey & Allen**, Glen Falls, N. Y. has been consolidated and will be carried on in future under the name of Trimbey & Allen with Mr. M. G. Tibbitts as sales manager. The offices and factory will remain at Glens Falls, N.Y.

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Bismarck Brown R. conc.
Safranine B.S.
Safranine R.F.F.
Methylene Violet 2R. conc.
Methylene Violet 2B. conc.
Malachite Green Crystals.
Methylene Blue B.B. conc.
Methylene Blue 1814.

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Paramine Sky Blue F.F.
Paramine Blue 2B.
Paramine Black B.H.
Paramine Yellow R.
Paramine Brown G. conc.
Paramine Brown M.
Paramine Fast Bordeaux B.
Paramine Green G.
Paramine Violet N.
Paraphenine Yellow G.
Diazamine Fast Yellow H.
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Minister of Lands and Forests.

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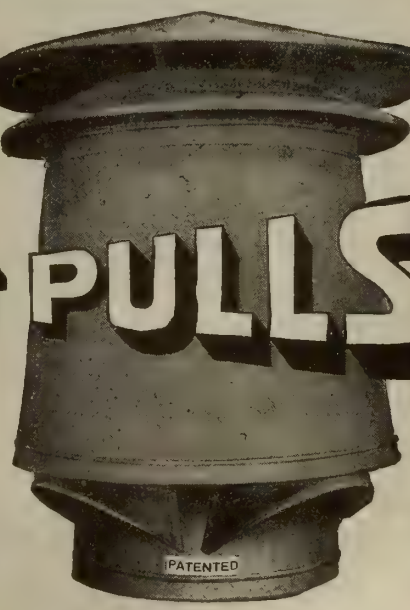
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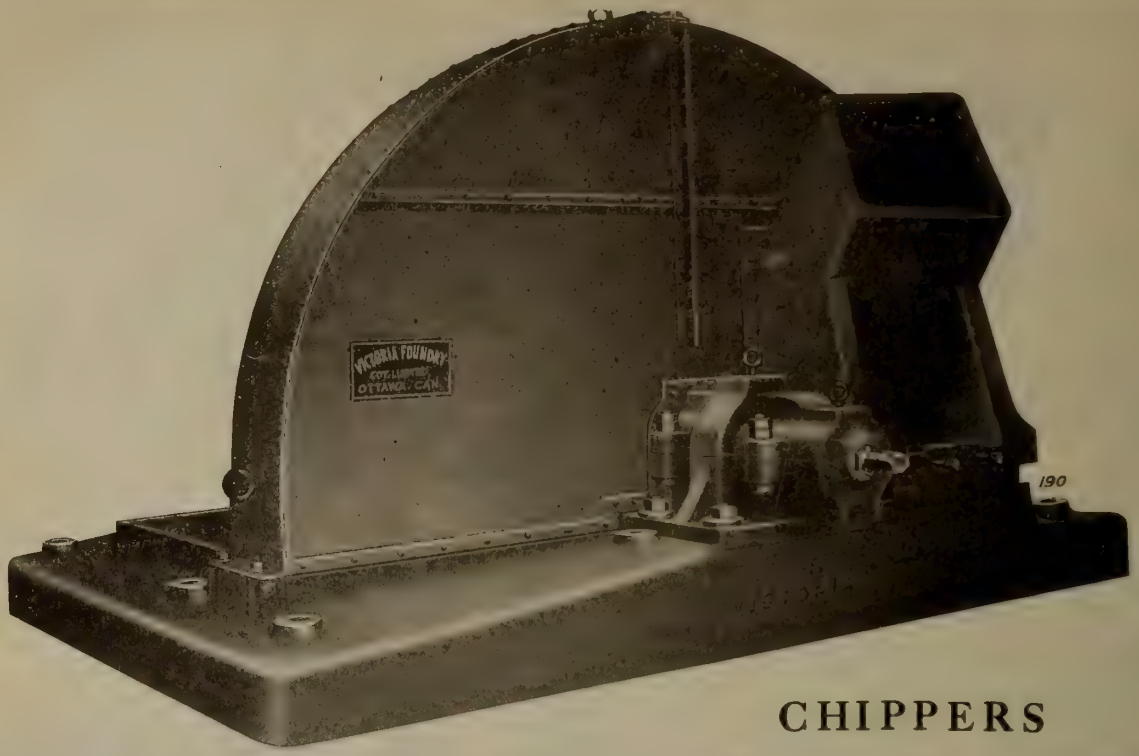
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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., February, 17th, 1921. No. 7

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Room 205 Drummond Building, Montreal, 'Phono Uptown 7773.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

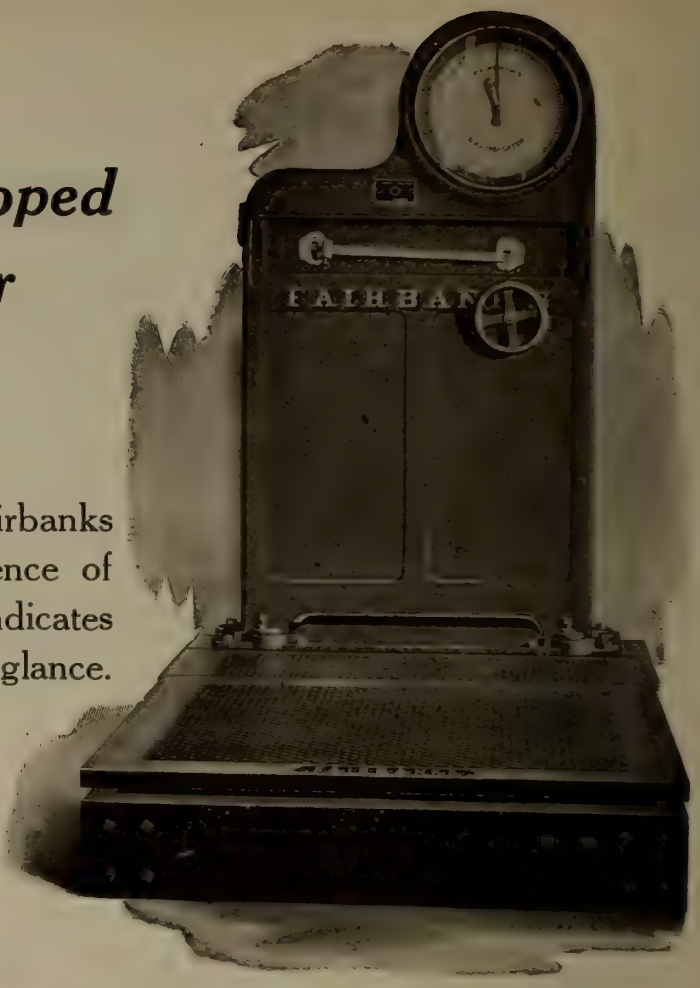
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EDITORIAL

EMBARGOS AND TARIFFS.

The Wood Pulp Importers in the United States evidently expect the coming Republican administration to consider a revision of the tariff on wood pulp. This material, of whatever kind, is now admitted free of duty. A statement of the argument the Importers are making to the Ways and Means Committee mentions that 600 paper mills use but do not make pulp, while only 15 mills make pulp for sale. The request is made that, if a duty for revenue be found necessary, such duty be "specific" and not "ad valorem."

With nearly a million cords of pulpwood from fee lands in Canada converted into pulp in the United States, and with the pulp imported rising from 27 to 45 per cent of the total used in the last two years, it is a curious coincidence that the plea of the pulp importer comes at a time when there is a growing sentiment in Canada for some restriction on the export of all pulpwood. The importer of pulp is, of course, acting in the interest of the paper mills he serves.

An import duty by the United States should have no effect whatever on Canadian pulp exports, since other pulp producing countries would be similarly affected. It might, however, have a good effect on our exports of papers made from wood pulp as the price of these would be increased in the States by the tariff on pulp while there is already a duty on the finished paper and this would perhaps not be proportionately increased.

On the other hand, an export duty on wood would certainly benefit Canadian pulp mills by putting American mills at a disadvantage and by materially extending the life of Crown limits. Mills in the Eastern states would be obliged to bring wood from the Pacific Coast, Alaska, Newfoundland, or Labrador or even Russia until reforested areas could reach a productive age, which would be an enormous hardship to such mills as have no adequate wood supply and the communities supported by them. In the meantime, unless marked improvement be made in the protection and administration of our own Crown lands, we greatly fear that such a tariff would be merely a fence behind which the present generation of pulp and paper makers would immensely profit because it would simply defer the day of Doom, when our forests, now rapidly disappearing, will be exhausted. If such a restriction is imposed, it is only fair the seller of fee land wood be compensated by an assured market and that the advantage accruing to our pulp mills be paid for by greater expenditures for better operation and protection of Canada's forest lands.

CORPORATIONS HAVE SOULS.

A few years ago it was quite common to hear a large employer of labor referred to as a "soul-less corporation." In some cases it was probably correct. The situation has, for the most part, materially changed for the better. We believe there are three reasons—a more enlightened and expressive public sentiment, the demands of organized labor, and a growing realization on the part of both employer and employee that profit for one and contentment for the other depends on mutual understanding, responsibility and fair dealing.

Of these three reasons, the first and last are the most important. The last is largely a result of the first and the first is often promoted or aroused by the second. The second, however, seems largely influenced as to its effect by general conditions of employment. The growing desire to co-operate happily with his employees on the part of most employers, because his heart so dictates and because his balance sheet shows it pays, is the most important aspect of business today. It means that we are at last getting down to the firm basis of the solid rock of open and honest dealing.

The labor unions have played a large part in arousing public sentiment and awakening the employer's conscience and will continue to have an important influence on the welfare of the community if they are willing to follow the constructive advice of wise leaders, selected for their knowledge of affairs rather than their ability to vituperate and incite.

That a union is neither a necessity nor a hindrance in the establishment of cordial relations in a contented community between employer and employee is well illustrated by the happy experiences of two large paper mills in Canada. They show that sincere personality is the basis of cordial co-operation and contentment. The difference in the character of the majority of employees, due largely to the influence of racial characteristics is an important factor in the courses of the development. The manner of treatment in each case is a triumph of the psychology of management and proof that where the employer is determined to be honest and sincere and generous, his employees will recognize it and respond by being loyal, responsible and contented.

We refer to the Abitibi Company and the Laurentide Company. The former is located at Iroquois

Falls, Ont., and the latter at Grand'Mère, Que. The Abitibi mill is thoroughly unionized and the Laurentide is a straight man-to-man organization. Why this mill was de-unionized about twelve years ago and is still without any outside affiliation is well told in an interesting story in the New York Times, to which, by the way, the output of the new machine is being shipped. This story is largely a repetition of the findings of the Industrial Relations Commission which inspected employment conditions last year. It retells the story of how the mill was once closed by a strike brought on by conditions in another mill, in no way connected with Laurentide, in spite of the contentment that reigned at Grand'Mère. Rather than suffer from what was considered outside interference, the mill seceded and the settlement of questions that might elsewhere lead to a strike has since been left to the Priest and the President. A friendly conference has never failed to bring an immediate solution satisfactory to both men and management.

But Iroquois Falls is also a prosperous and contented town and the unions are particularly strong and well managed. The cordiality existing between the mill men and the management was exemplified by an incident that occurred the last time the Editor visited the mill. A general strike was on and the mill was down for a few days in consequence. As in the case at Laurentide twelve years ago, the men had no complaint locally and there was feeling of animosity to be detected on either part. When word came to resume work, everything went ahead as usual.

With such examples as these it may be expected, as it is hoped, that men and mills where conditions are well-nigh ideal will not be penalized because of unfairness on either side in some other plant. Such general strikes, as they affect contented communities, are in the nature of sympathetic strikes and these are in growing disfavor in the opinion of the public.

It is a sincere compliment to the men and the managements of the paper and pulp mills of all America that cordial relations are so general and labor troubles so rare. When, with his mills closed, a pulp man employs as many as possible in making repairs and assures the rest of his people against discomfort, we have a happy state of affairs of which we may indeed be proud. Let the mill be union or non-union, if the management is honest and generous and the men are loyal and fair-minded, as they generally are in the paper industry, it will be plainly evident that corporations, now-a-days, have souls.

COBWEBS.

The new Alcoholic Liquor Act of Quebec, in the light of Premier Taschereau's remark that he desires to encourage the use of wines, and the statement that the Government intends to have a law which can be enforced, seems to be a slap at prohibition and ostentatiously an encouragement of temperance.

We were delightfully fooled by the story of the suicide at the Iroquois Falls school house as told in the "Broke Hustler."

It is estimated that the domestic consumption of pulpwood in Canada in 1920 was 3,500,000 cords, compared with 2,428,691 cords in 1919.

With Martin's "Papyrus" for January, the John Martin Co. includes a very interesting and instructive supplement on the cost and profit in running a country newspaper.

Twenty-five cents will be paid for copies of the Pulp and Paper Magazine for January 20, 1921. There has been an unexpectedly large demand for this issue, which is now completely sold out.

The Boston News Bureau says, in an editorial on "Why Newsprint Stays Up" "It takes 75 years for a spruce tree to grow to logging size; and the annual growth of our forests is more than annulled by fire and worm. Our pulp forest resources are as much an 'exhausting proposition' as the mine which must close when its ore is gone, and we are fairly in sight of the end."

The inspiring address of Mr. W. P. Burnett, on page 188 of this issue splendidly supports our contention that corporations have souls.

SIR WILLIAM PRICE ENDOWS CHEMISTRY COURSE.

Laval University, Quebec, which was recently the recipient of $25,000 foundation from the Price family, has decided to use the money to encourage scientific studies, and especially the students of the new course of chemistry, which is to be organized next year. The revenue from the foundation will be divided into two or three scholarships.

Sir William Price, whose pulp company had already subscribed $25,000 to l'Aide a Laval, in presenting the additional $25,000 as a foundation wrote to Mgr. Pelletier as follows:

"Monseigneur:—For many years my family has lived and worked in this part of the Province of Quebec with the French-Canadians on the most cordial terms.

"As the head of the Price family, and to show its appreciation of the happy relations with your people, I would esteem it a great privilege if your university would accept a foundation in the name of the Price family.

"This foundation would be a capital sum of $25,000, the revenue from which would be at the disposal of your university.

"If this is acceptable to you, I would suggest that this sum, which can be paid over during the next three months, be placed in the hands of Sir George Garneau and myself, as trustees.

"I have asked my friend, Sir George Garneau, to hand you this letter and to act on my behalf."

Ventilation of Paper Mill Machine Rooms

By H. S. TAYLOR.
Chief Engineer, Management Engineering and Development Co.

(Address at meeting of Technical Section, C. P. & P. A., Montreal, Jan. 20, 1921.

The problems of heating and ventilation of structures designed for the accommodation of the human being, either as a place of residence, travel, toil, or for recreation, have from early periods received much intensive study, and as a result the heating and ventilating engineer of today is in position to specify a most efficient installation, whether it be a simple hot air equipment for the modest dwelling or the complicated system of air handling equipment required to ventilate the many miles of subway and tubes in and about the largest city on the continent.

In selecting the two illustrations as above mentioned you will note that in the case of the modest dwelling, the requirement is one of heating, whereas for the subway it is one of ventilation. The underlying principles of these two requirements, however, are the same; and in many installations the objective of the one single operation is both heating and ventilation. Take for instance the modest dwelling, the objective is to replace the volume of air within with a like volume, containing heat units of a number sufficient to raise the temperature, and hold it to the desired temperature, and further, this replacement of air change, we will call it, must be even and continuous; the rooms must therefore be ventilated so as to give the desired circulation which makes an air change possible. A simple test of this statement is to shut tight the door of a room in which there is a connection from the hot air furnace and note that so long as the room remains tightly closed the heating is barely noticeable.

In the case of the subway the objective is to remove heat units and foul air, through the supply of fresh air and its subsequent removal laden with its burden, in other words, the one operation is simply the reversal of the other. With the dwelling the air change is, you might say "driven" from the heat of the air itself, whereas in the subway powerful blowers and exhaust fans maintain the circulation, and resulting air change. Should heat be required during the colder periods it is only necessary to heat the incoming air to produce the desired temperature thus covering the two requirements in the one operation. Air then is a medium for the delivery or removal of heat, moisture, or impurities, and this property of our atmosphere is, I believe, the solution of the problem set forth by the subject of this article.

A personal tour can be made through the factories of many of the big industries of today and conditions as regarding heating and ventilating found good, or at least fair, until we come to the most important department of one of the leading basic industries, namely, the Machine Rooms of Paper Mills, and their general characteristics are to a great extent the same for almost any grade or volume of production. Conditions in these machine rooms we find in general not even fair, and in many, extremely discouraging. Intense heat, seemingly the more intense from extremely high humidity; in many cases the roof and walls saturated and dripping, and the air thick with vapor. The visitor, if he is not accustomed to paper machine rooms, generally loses interest about this time and beats a hasty retreat through a doorway in opposition to the outside air that is attempting to gain admission in much larger quantities than the size of the opening will permit—and I might say that it would not be the least improbable that increased capacity of exhaust fans were being planned for in this particular machine room to relieve the conditions that were causing loss in production on machines and general dissatisfaction among the men who must remain within the room.

The rush of air from the outside through door openings clearly indicates exhaust fan capacity as already over-sufficient and a condition of partial vacuum within the room. Exhaust fans are taking their supply direct from openings where ever existent in direct currents, and about and between these air currents a condition of partial vacuum may be said to exist, through which moisture laden air slowly rises to condense on unprotected surfaces above. In place of increased capacity of exhaust fans this room is demanding an increased supply of incoming air. The demand is there, but the supply is not, and we all know from our earliest experiences that an ideal condition is impossible unless the condition of supply and demand is balanced, and I may say that in the majority of cases, to this failure to supply an adequate volume of incoming air, can be attributed the disagreeable and deteriorating conditions found in many paper mill machine rooms that are described by the visitor as "Poorly Ventilated."

With conditions as above outlined a conclusion is at once arrived at, that the processes as carried on within these paper machine rooms must present features somewhat out of the ordinary from a heating and ventilating standpoint, and upon analyzing conditions as they do exist under normal operation, we find such a conclusion correct.

Let us take for example a two-machine room with a normal production of 100 tons per twenty-four hours —the sheet going to the dryers 33% dry and to the reels 95% dry. With this assumption we find that for each pound of production 1.95 lbs. of water is evaporated at the dryers and for each 100 tons of production per 24 hours, a total of 390,000 lbs. of water or 270 lbs. per minute is discharged from the dryer section and must be removed from the room in the form of saturated vapor; this in addition to the moisture rising from wire, flow-boxes, etc., that while low in quantity is also at low temperature and therefore practically at the dew point.

There will be in this two-machine room practically at the floor line approximately 15,000 square feet of dryer surface, under from eight to fifteen lbs. steam pressure, forming radiating surface sufficient inasfar as heat is concerned to heat a room of twice the volume under extreme low temperatures, and this radiating surface as mentioned above is practically at floor line.

There will be in this room approximately 23,000 square feet of floor surface — and a like amount of roof slab. There will be approximately 28,400 square feet of wall surface, and 701,500 cubic feet of volume. Of the 23,000 square feet of floor surface approximately 3,400 square feet may be open to basement, and of the 28,400 square feet of wall surface, approximately 3,600

square feet will be single thickness window glass, and 200 square feet openings into other rooms protected by fire doors, but open as a general rule.

With the foregoing conditions as existent within the room, the problem of Ventilation is before us and heating must also be resorted to, not for the purpose of raising the temperature at the floor level, but to hold the temperature beneath the roof slab, and about the supporting structure and walls, above the dew point of the moisture-laden air rising from the machine, and so saturated that but a few degrees difference in temperature will cause condensation. With low temperatures without, the underside of the roof slab, unless insulated, will present its entire surface as a condensor, and the supporting structure and walls will act in a similar manner.

We find, therefore, that to properly ventilate this machine room we must, First, remove the volume of moisture laden air rising from the machine and replace the volume removed from outside sources, and Second, insulate the under side of roof slab, roof structures and walls with air of a temperature that will be above its dew point.



Fig. 1.—View from winder end of paper machine room. Lines A indicate hot air ducts carried on roof trusses. Lines B indicate exhaust uptakes for moist air, made telescoping so that lower half can be raised to allow crane to pass.

There are two methods of removal that can be utilized First, natural draft, and Second, positive exhaust. Experience has shown that while natural draft is serviceable for removal in machine rooms of low production, it has not the capacity for removal of the large volumes required under modern practice. We will, therefore, select the method of positive removal through exhaust fans. There are also two sources of supply for incoming or replacement air, in that it can enter through door, window or other specially designed openings, or can be delivered to room through a properly designed blower system.

For raising the temperature at underside of slab, roof structure and walls, there are two methods available, First, through direct radiation suspended from slab, and Second, through heating the air delivered to replace that discharged through removal.

In summarizing, there are then two systems outlined: First, the system of positive removal and replacement, with the replacement air heated to the most efficient temperature; and Second, a system of positive removal and either natural or positive replacement with direct radiation providing heat for insulation of roof slabs, roof structure and walls.

Natural replacement of air in the quantity required is not feasible, more especially so in locations of extremely low temperature. A machine room of dimensions as mentioned above should have normally a 7½ minute air change, or roughly 94,000 cubic feet of air delivered per minute, and openings in buildings to admit such a quantity would be to say the least undesirable, and further at low temperatures this volume of outside air would be extremely difficult to handle at floor level, even though sufficient direct radiation be installed under the roof to hold the temperature above the dew point. We are therefore brought to the conclusion that positive replacement with mechanical blowers should be the method selected.

With positive removal and replacement, we then have the principle of subway ventilation as previously brought to your attention. In other words, a sweeping out of the room through the medium of air and the accompanying removal of moisture content. As previously explained, however, sufficient heat units must be delivered to hold the temperature of the moisture laden air above the dew point, and we have only to decide whether the necessary heat units shall be delivered through the incoming air or from direct radiation.

A system of direct radiation beneath the roof, over an area of 23,000 square feet is an expensive installation and also difficult to maintain, due to moisture that must continuously surround this installation. Furthermore, this system can be utilized only to hold the temperature to the desired point; it can not in any way act in the removal of the many tons of water delivered from machines, for this work must be done through removal and replacement. Therefore, so long as this removal and replacement equipment must be installed, let us supply the heat required with the volume of replacement air, and dispense with a costly system of direct radiation.

In order that there may be no doubt that in so doing the right principles are being followed, we will compare initial costs and operating efficiency of a positive removal and replacement system against that of direct radiation.



Fig. 2.—Paper machine room from wet end. Lines A show distribution headers for hot air. Lines B show exhaust uptakes from dryer hood. A glance at these two figures show clearly the distributing vents which direct the hot air both upward and downward. Note crane just over front end of dryer hood.

For the machine room as outlined, with a system of positive removal and replacement, approximately 94,000 cubic feet per minute of replacement air is demanded, equivalent to 7½ minute air change based on a 5 minute change at dryer sections and 10 minutes through balance of room. Heat required is to be introduced with this air, and with an outside temperature of 20 degrees below zero it has been found from actual experience that approximately 2,400,000 B. T. U's must be supplied with this incoming air, and this demand is met with incoming air at a temperature of 84 degrees F. Heater coils should be of a size to permit to 100 degrees F. but except through periods of extremely low temperature 84 degree F. continuous will give the desired results.

With outside temperature at 20 degrees below zero and incoming air at 84 degrees, approximately 9,900 lbs of steam is demanded. Nine hundred lbs. for engine and nine thousand for heater coils. Ninety per cent of engine steam, however, is returned to coils so that net demand is 9,090 lbs. per hour, and this includes heat loss through roof, walls, etc.; for an outside temperature of zero the net demand would approximate 8,200 lbs. and for 60 degrees—960 lbs. per hour, equivalent to 300, 273, and 32 Boiler H. P. respectively.

A system of total capacity of 94,000 cubic feet, with distribution system, steam and condensate connections, will cost today about $22,000 installed; this cost does not include exhaust fans, hood or up-takes as this latter installation is required irrespective of the method of supplying heat. For the room in question, a figure of $220 per daily ton can be used for estimating purposes. If hoods, exhaust fans, up-takes, etc. are included, this figure should be increased to $320 per daily ton.

To compare a system of radiation we must figure losses through surfaces, and then give an equivalent number of infiltrations to at least approach the air change that a fan system would give. These figures will show a total expenditure of 11,200,000 B.T.U's on 250 B.T.U's per square foot of surface per hour, would show a requirement of about 44,000 square feet of radiation, which, based on one-quarter of a lb. per square foot, would be equivalent to approximately 11,000 lbs. of steam per hour, or but a slightly higher hourly demand than that for the positive system. Losses through roof, however, with a system of direct radiation would increase this steam demand 100%, due to the much higher degree of heat under the roof. With the positive system air entering at 84 degrees would be about 80 degrees under the roof, or, with outside air at 20 degrees below zero, a range of 100 degrees. With direct radiation close under the slab, the temperature will be very close to 180 degrees, of a

range of 200 degrees. Loss of B.T.U's through any surface is proportional to the difference in temperature between the two sides, and loss through direct radiation would, therefore, be 200 per cent of loss with positive system.

Approximately 16,000 lbs. of steam would be used per hour with a direct radiation system, under conditions as stated for a net demand of 9,000 lbs. for the positive system, and would be equivalent to approximately 533 Boiler H. P. vs. 300.

A direct radiation system as described above would cost today about $45,000 installed, or $450 per daily ton, over 100% greater than cost of a positive system.

My objective in the preceding paragraphs has been to take you step by step through the different phases of the subject in order that you may thoroughly understand the system that I believe to be practically and also theoretically the most efficient, and further on two installations that I have been directly interested in it can be proven, even with extremely low outside temperatures; that the interior of a machine room with normal production can be kept at an efficient working temperature and with it a degree of humidity that will allow glasses to be worn on any part of the floor without moisture condensing thereon, and this I believe to be a very fair test especially when entering a machine room.

We now come to the method of removal of air and also of replacement. There have been among certain mill owners serious objections to hoods over dryer sections of paper machines. These objections no doubt, are due to interference from hoods and uptakes with machine, crane, etc., but it can be stated that with very few exceptions those mills that commenced operation without a hood were so equipped within the first year after commencement and this later installation was made with much inconvenience and additional expense. I believe, therefore, that the industry in general is convinced that a hood of proper design is desirable, and I can further state that from a ventilation standpoint it is absolutely necessary.

For a two-machine mill, uptakes from hoods may be either horizontal through the wall or vertical through the roof. For a machine room housing more than two machines vertical uptakes must be resorted to, and even with a two-machine mill the vertical uptakes are preferable in that the discharge is direct and cost of installation less. There is no difficulty in providing a passage way for the crane, and the hood can be so designed that no interference is caused to any part of the highest speed machines.

For the two machine room in question three uptakes from each hood are recommended, of approximately 6′ diameter each. In four of these uptakes exhaust fans should be installed and in the two uptakes at the dry end, one for each machine, either exhaust fans can be installed or this vent designed for natural draft. I have been interested in numerous installations where natural draft was used in this vent, and operation was perfect.

The fans for replacement of air should be of standard equipment selected in the case of the room in question, for approximately 95,000′ per minute delivered for the machine room only. Additional capacity must be allowed for basement or any other departments that are heated from this unit. It is customary to allow full intake from outside air, but a damper installed in the fresh air casing permits recirculation with extremely low outside temperatures, thus decreasing steam demand. This recirculation, however, is limited and is not allowable for air direct from the room in question, in that the purpose of this system is thus defeated.

With a two machine unit including machine room, beater room and finishing room, it is advisable to install two sets of replacement fans, one for each machine, rather than one unit for the entire requirement. Each fan can be designed to supply heating demand for its proportion of beater and finishing room, as well as one half machine room requirements, but it is far preferable not to extend demand beyond machine and finishing rooms, as these fans are primarily for the machine room, and if distribution piping therefrom is extended over a large area, the tendency will be to deprive the machine room of its proper supply.

The replacement air can be distributed at any point of machine room. The proper distribution, however, is in the roof truss structure near the underside of roof slab. For a two machine room one line of distribution at the wall on either side, with two center lines, one on either side of the centre of the room is recommended. All lines of distribution shall have openings directed both toward the roof and vertically downward, designed to distribute approximately one-third of the volume to the underside of slab and two-thirds downwards the floor. It has been stated that approximately 94,000 cu. ft. of air per minute is required for this machine room and exhaust fans four or six in number should be installed for a total of not more than 85,000 ft. thus producing a slight pressure within the room, the heated air being forced toward the floor level through pressure from the supply above, giving an even distribution downward, thus meeting the volume of moist air rising from the lower level, and sweeping it out under the hood and through the uptakes, together with the large volume of saturated air rising direct from the machine itself. This condition of slight pressure is a most important feature, in that openings in floors or walls cannot in any way cause interference with the proper operation of ventilating equipment, whereas, should this condition of pressure be changed to one of partial vacuum, through the capacity of the exhaust fans being greater than the delivery fans, a rush of air through any opening will result. This inrushing air during the winter season will be of extremely low temperature if from the outside, and if from the basement, will be laden with moisture in addition to its low temperature. Statements have a number of times been made to the effect that openings should not be left in the floor on account of interference with ventilation of the room. The actual cause of interference, however, was an insufficient supply of air to replace that demanded by the exhaust fans, and as previously stated this lack of sufficient replacement volume is the cause of a great percentage of the failures in machine room ventilating systems.

Should conditions be not as they should be within the machine room the immediate conclusion of course is that the moisture and heat are not being removed and in order to relieve this condition exhaust fans are speeded up. There will be a partial vacuum throughout the room, moisture arising from lower level, will ascend meeting roof slab, supports, and walls where condensation takes places with the resulting drip. Steam will curl out from under the hood due to insufficient

circulation, and the room can be said to be in a very poor condition, from a ventilation standpoint.

It may be that exhaust fans are operating under speed. This can be easily ascertained by speeding them up and observing if improved conditions result, but in the majority of cases the fault lies entirely with the incoming supply being insufficient to replace the volume demanded by exhaust equipment.

With a system installed as outlined, of positive blowers equipped with steam coils for heating the incoming air; with a properly designed distribution system under roof slab,—with hood and uptakes equipped with exhaust fans operating at a capacity slightly

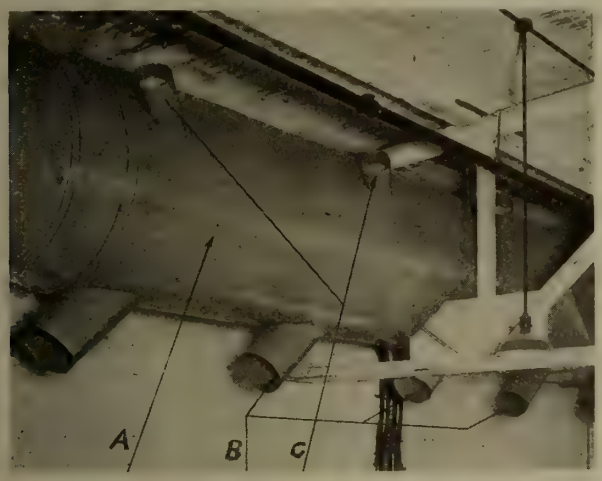


Fig. 3.—View of distribution header A, showing also vents B discharging about 2-3 of the warm air downwards to the room, and vents C discharging about 1-3 of the warm air upwards to the roof.

under that of the incoming fans, a machine room is equipped with an installation that will properly ventilate the room, providing its operation is efficiently handled.

As previously stated the action of this system of ventilation is to sweep out the room, freeing it of all moisture and excess heat. The moisture, it must be remembered, requires removal irrespective of the degree of outside temperature, therefore the air change within the room should be kept fairly constant summer and winter. For winter days of extremely low temperature, however, heat units delivered with the incoming air must be greatly in excess over that for a summer day where outside temperatures are much higher. The regulation of this system will therefore depend to a great extent on steam supply to heating coils the fan speeds requiring very little attention. The regulation of steam to coils can be quickly mastered by the Engineer in Charge through actual conditions within the room, as providing air change is constant and condensation or vapor show steam supply insufficient, and if drybulb thermometer shows too high temperature, incoming air is being overheated.

A word might be said here as to the effect of the type of construction of the machine room on its ventilating properties with the system under discussion. It can be readily be seen that with a low outside temperature, the incoming air must be heated to prevent condensation, and further, efficiency of the system must depend on the retention of this heat within the room, therefore the lower the conductivity of the enveloping structure, the greater the retention of heat units, and what is more to the point, coal in the bunker. Paper mills of any size are now built of fire-proof construction, employing concrete, steel, brick or tile, except as regards roofing material,where wood has been the standard material to a great extent, and through a wooden roof the largest number of heat units are lost. For durability, fire-proofing qualities and non-conductivity Gypsum roofs are fast coming into use, and I may refer you to an article in "The Pulp and Paper Magazine of Canada" Volume 18 for July 8th, 1920, that describes the general qualifications of this type of construction for machine room roofs, it having a conductivity in comparison with wood roof of 3.21 to 4.61, and of concrete 3.21 to 13.8.

For proper lighting effect, especially for a room containing two or more machines, it is without doubt necessary to install sky lights. This sky-light area, however should be held to a minimum due to the high conductivity of glass and resulting heat losses through it. Glass areas in the walls should be designed with a view of admitting sufficient light but no more. In a large number of paper machine rooms, window glass covers a large area and this large area is in inverse ratio to the size of the coal pile at the end of the winter season. In other words protect the interior of the machine room from outside temperatures to as great an extent as compatible with cost of construction. As an example, an air space can be left in brick walls with little extra expense, whereas with a concrete wall an air space involves an expenditure that is prohibitive, but wherever air spaces can be left, insulating qualities are greatly improved.

In summarizing, the more insulated the building structure itself is against outside temperatures, the less steam is required for ventilating system, and the lower the cost of operation, and in locations where extreme low temperatures occur, and there we find paper mills of the greatest production, this heat unit retention is of the greatest importance.

There is one other condition that has a direct bearing on a system of ventilation such as described in this

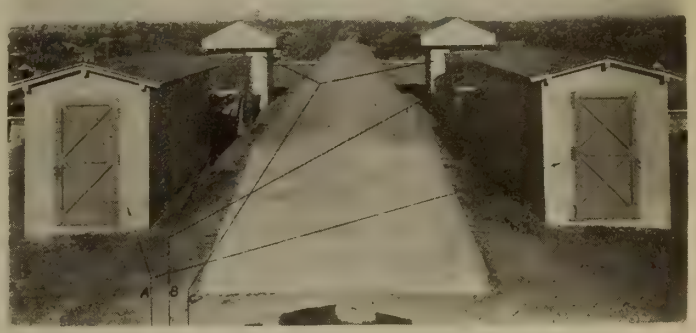


Fig. 4.—View of roof showing motor houses A, Fan uptakes B, Gravity stacks C.

article, namely, a system of blowing heated air directly within the dryer section. There are a number of such systems on the market and they are an aid to increased production, in that steam within the dryer pockets is absorbed together with moisture from the sheet.

These systems have their value in the production of heavy sheets, such as board, pulp or wrapping, as the capacity of the machine is generally dependent on drying capacity, and any system that will give increased drying effect will thus increase production. It can readily be seen that the volume of air distributed by such a system can be deducted from volume required for machine room ventilation, in that volume of replace-

ment air is simply a total of that distributed through a single or multiple system.

The description that has been given including general details, is that of the system I believe the most efficient. Slight changes, will be required for different mills, due to type of construction, conditions of exposure, space available for fans, and other general characteristics that differ slightly in different locations. For the best results, the installations should be designed individually for location selected, and if the system is installed and operated properly, condensation and varying temperatures will disappear and in their place a clear atmosphere with even temperatures at all seasons will appear; and such a condition is the aim of the operator; for the men whose working hours are spent at the machines; for the building that deteriorates rapidly when saturated with moisture; and last but not least, for increased production itself.

(Discussion to follow.)

The Paper Box Industry is Full of Hope

The following paper was prepared by Mr. W. P. Bennett, of the Rudd Paper Box Co., Limited, Toronto, and read in his absence by Mr. B. Sproule, of Collett-Sproule, Limited, at a luncheon of the Toronto Carton Club held at the King Edward Hotel on February 8th.

What can we do to make the best of and improve present quiet conditions in the Paper Box Industry—from the standpoint of handling labor?

Shall we consider reducing the wages of our employees to help improve present quiet conditions?

No!

A few months ago, at a meeting of the Toronto Carton Club, we discussed at some length, the difficulty of obtaining workers for our industry and at that time we came to the conclusion that we should grasp the opportunity then presented, of increasing wages to the extent of placing us on at least the same basis as other lines of manufacturing, who were employing help of a similar type to ours. This would enable us not only to hold the employees whom we had trained to our business, but at the same time attract a desirable type of workers to the industry. During the past year or more, we have been fortunate in accomplishing our aims—our industry is flourishing, our employees are well paid, and it would therefore appear regrettable for us to use the temporary slackness of our industry as an excuse for reducing the wages of our employees and thus destroy in a moment the good accomplished in the past.

Are we not taking too seriously to-day's temporary condition and perhaps overlooking the thought that our problems should be discussed and a solution sought, not from the narrow angle of to-day, but from the broader viewpoint of to-morrow, next month, the years to come? Is there a member here who will deny the thought that we are living in a country which cannot be held back from rapid development for many years to come? We are guiding an industry which at the present time is hardly more than in its infancy, so if we are to "Advance" as our Slogan suggests, our thought should be:—an we by study and co-operation so increase the efficiency of our various plants that in addition to our receiving a fair return for our investment, we may consider the possibility of paying our workers **more** in the years to come, rather than **less.**

Speaking particularly of to-day and thinking of the prosperity we have all enjoyed during the last few years, would it not appear to be good judgment on our part to keep our loyal workers employed even if only on shorter hours until our industry resumes its natural stride?

The time is, of course, most opportune for a weeding out process, i.e. the elimination from our industry of such workers who have not proven themselves capable and who serve as a handicap to the loyal employees who are entitled to a continuance of their present wage. If we are able to maintain our present wage, at a time when the reverse thought is in the air, I am confident that we will be more than repaid by a speeding up in production that will surprise us.

May I further trespass upon your time by expressing my opinion regarding our general attitude as an industry in its relations to the various trades with whom we are dealing and hope to deal?

We are undoubtedly entering into a new era, one of the features of which will be keen competition, not only among various nations for the world markets but of necessity within each group of industries. Are we ready? Let us take an inventory of our condition.

How many of us have read the book to which many of you contributed—"The Paper Box Factory Efficiency and Production?" It is full of meat. How many of us are studying our costs? Have you a cost system? Are you using it? Are we watching our stocks of raw materials to reduce them to the minimum?

Are we scrutanizing our credits? Are our salesmen—salesmen, or order takers and price cutters?

Let us each answer these questions to ourselves, strengthen our position and sell our product on as close a margin as is consistent with good workmanship and prompt service.

We are in this fortunate position: A large proportion of our goods is of such a bulky nature that we are not seriously harassed by competition from other countries. Raw materials are lower, and may be further reduced in price which will aid in bringing back many lines of boxes, which, during the past few years have been abandoned, new industries are starting every day and there are many new and untried uses for the paper package which our ingenuity will discover. None of us has yet realized the advertising value of paper boxes which, when realized, will further increase the popularity of the paper package.

Instead, therefore, of dwelling too much on the petty problems of to-day, let us rather look forward with a firm confidence to the future which is full of hope and prosperity for our industry.

HANDLING BATES' FELTS IN BRITISH COLUMBIA.

The well known Bates' Press Felts manufactured by Bates & Innes Ltd., Carleton Place, Ont., are now being handled in British Columbia by the Jamieson Engineering Co., 103 London Bldg., Vancouver. This Company is handling a number of other lines of Paper Mill supplies.

The chief executives of the firm are Mr. E. A. Jamieson, C.E., and Mr. J. A. Walker, B.A.S.C., both of whom have had considerable experience in survey and power development work as well as Paper Mill engineering in this Province.

Technical Section Meeting

An account of the Annual Meeting of the Technical Section of the Canadian Pulp and Paper Association, held in the Ball Room, Ritz-Carlton Hotel, Montreal, P.Q., Wednesday, January 19 and 20, 1921.

Mr. L. H. Shipman, chairman, presiding.

Mr. A. L. Dawe, Secretary.

Chairman L. H. Shipman called the meeting to order with a few brief remarks:

I will just say this before leaving office that I want to express my appreciation—and it is real—for the splendid co-operation that I have received from the executive council of the Technical Section this year, and particularly do I want to express appreciation to the Secretary, Mr. Dawe for his splendid work, and for the splendid help he has given me in guiding me in the various duties of the office during the past year.

REPORTS OF COMMITTEES.

It was voted that the minutes of the previous meeting be accepted as read, motion by Mr. Carruthers, seconded by Mr. Hovey. The full text of committee reports will be found in the Pulp and Paper Magazine for January 20, 1921.

The report of the Committee on Programme was taken as printed.

Committee on Education.

This report is found on page 81 for Jan. 20.

One of our great efforts during the past few months, has been to get some concrete examples of the work before you, and Mr. Kellogg has this morning produced the first volume of the text books. It came off the press yesterday afternoon at four o'clock, so you will see it is about the latest thing in pulp and paper technology on the market. In fact, it is not on sale yet. This volume contains Arithmetic, Elementary Applied Mathematics, How to Read Drawings, and Elements of Physics. Volume 2 will treat of Mechanics and Hydraulics, Electricity and Chemistry; Volume 3 will cover the Manufacture of Pulp; Volumes 4 and 5 the Manufacture of Paper, etc.

One of the main activities of the Committee in the future will be to get that into the hands of the consumers. We are providing the horse with water, and the next line of action will be to try and get the horse to drink it, and I do think it will be very difficult.

Another thing not alluded to in the report of the Committee, is the report on occupational work in the industry, and the means to get the educational authorities in touch with the needs of the various occupational branches. This report was written by Mr. J. C. Wright, who is the Assistant Director of Industrial Education of the Federal Board of Vocational Education of the United States. It is very complete and will be issued in pamphlet form. It is now running in serial form in the Paper Trade Journal, and is now available to the readers of that journal. It will take between two and three months to run it serially, and we will get it in pamphlet form as soon as possible after that.

There are the only two new points. I think we ought to emphasize the work amongst the students. During the past summer there were some sixty students from the various universities taken on at the various mills. That is an advance of one hundred per cent over the year previous, when we reported thirty students. This year we have had sixty students in the various mills, and they have rendered an extremely good account of themselves.

Last year we found that seventy-five per cent would have been welcomed back in the mills again — from the report we had from the mills, and I think the thanks of us in the industry should go to the universities and to Mr. Dawe for the work that has been done in this matter.

Fourteen of these students submitted essays in the competition. The result of that competition will be announced very soon.

Abstracts and Publications.

Mr. J. N. Stephenson referred to the report as printed, and added:

Further than that I have nothing to say beyond thanking the members of the section, on behalf of the Committee, for the assistance they have given us in carrying on the work, and we would like to have suggestions from the members as to how this service can be improved.

Mr. Ross Campbell: It may be of interest to the members to sketch briefly what we are planning to do with all the abstracts across the line.

We have felt for sometime that one of the weaknesses in our abstract work was the fact that these appear from time to time in the journals, and unless they are indexed by the librarian, or by someone who is responsible for them, after a few months their location is forgotten, and we propose down there to make them public once or twice or three times a year, put these abstracts altogether in one place and then have them properly indexed and cross indexed, so that they could be filed for reference, and held as a permanent reference work. That is what we are planning to do now.

The abstracts will, as formerly, appear in several of the paper journals, but they will also be collected and appear, properly indexed, in the T. A. P. P. I. proceedings.

Mechanical Standards.

The Chairman: Speaking generally, the standing committees have done very good work during the year, but specifically there is one committee that I feel has done most excellent work, and I take great pleasure in calling upon Mr. John Stadler to tell us of that work, in his report on the activities of the Committee on Mechanical Standards.

Mr. Stadler: Mr. Chairman and gentlemen.—I don't think the Chairman is justified in making any such reference to the Committee on Mechanical Standards.

Furthermore, it must not be over-looked that the main Association has appropriated certain funds for doing the work, and we have availed ourselves of this appropriation, consequently, we have been in a position to call in a little more outside help to have work done, which we considered would be of general interest to some branches of the industry.

You will find the report of the Committee on Mechanical Standards in printed form. I will not read it because you will get more from it by reading it at your leisure.

There is, however, one think I want to point out to you, and that is that the Committee has changed en-

tirely its attitude in regard to accomplishing anything by the plan as originally outlined.

You will recollect that previous to last year's meeting, a month before—we sent out a questionnaire. This questionnaire was sent out to all members of the Association and to all the mills. Out of one hundred and forty-seven questionnaires sent out, your Committee reports the receipt of questionnaires to the total number of ten. Out of a total number of ten received, only five of them have information that we considered would be or could be used by us for comparative purposes. However, if you consider that the number came down to only five, and if you look at the total number of mills represented in the Association, it looked to us as if the information tabulated on such a basis would be very much one-sided, and, therefore, we discarded entirely the information thus obtained, and only made reference in our report to certain facts.

This questionnaire revealed one of two things, either that the people had not as yet given sufficient attention to mechanical details around the plant, or they did not want to give the information. I am rather inclined to believe that the first is the case, that they have not given sufficient attention to details.

We could not do one thing we had set out to do, and that has been the study of resistance of paper stock in pipes. We have found a method of making it, but we reserved this for further investigation, and as we say in the last part of our report, we expect to publish that in the Pulp and Paper Magazine as soon as the data is available, which we hope will be sometime during the year. I really believe that the sooner we get some information in regard to resistance of paper stock in piping, the better it will be because at the present time there is so much guess work connected with it, and quite often you want to do certain work, and when you put this equipment in operation, you find you have entirely under-estimated the resistance of the pipe, and consequently the horse-power, and so we will try and get this finished as soon as possible.

As I told you a number of questionnaires were returned, but the number which could be of any use was very small. I want to add that I do not wish you to take this as a criticism: I just want to bring before you the facts, and ask you to bear in mind that probably some other day we will get out an additional questionnaire, upon which probably we will not ask so many questions, and we hope, when this questionnaire is sent out, you will reply to it whichever way you think. Do not hesitate to express your opinions on such things. It is the opinions that count to a very large extent in assisting us to formulate our committee reports.

I want to say that it was not our intention to go, in this work, into anything of a highly scientific or technical nature. Our whole aim was to work out some practical data for scientific investigation.

Mr. Stephenson: I move that the Technical Section accept this report and extend the thanks of the Section to the members of the Committee for their excellent work, with the hope that the members of the Section will co-operate more promptly and more fully with the committee in getting the rest of the program finished which they now have before them.

The motion was carried.

The Chairman: Your Chairman feels just exactly as he stated in calling for the report of the Committee. This Committee has been, as some of us at least know, a hard-working committee. They have a long job ahead of them and they have done a great deal of work already, and the final result will bear out what I say — I am very sure of that, and I simply speak in this way to emphasize to some of you who perhaps are not quite familiar with what this committee is doing, that you keep in touch with them and give them your help.

This is one of the most important committees we have, and luckily we have the men on it who are doing the work.

Moisture in Pulp.

Mr. Slack: Mr. Chairman, I wish to say, in addition to the printed report that your committee have in the past brought up a standard for testing moisture in wet pulp and at the past two meetings, I have brought up the question of how the dry pulp is tested. There are three well-known methods of testing dry pulp, that of testing by the strip, by the disk and with the wedge method. I feel that the members of the Committee are somewhat handicapped because in each mill they are using mostly different methods, and I feel that the only way to get at a standard in testing this dry pulp would be to arrange with the American committee and also with the English committee and the Scandinavian committee in order to arrive at some basis by which we could determine which would be the best method, so that we could have a standard method of testing dry pulp, but at the present time, different methods are used by the different mills.

I have visited mills in the States, and one mill would be using the strip method, and one the disc method, and perhaps the third one would be using the wedge method, and I feel we ought to appoint a committee here to deal with the American committee in trying to secure a standard method for testing moisture in pulp.

Mr. Crossley: I move that the committee's report be accepted and the thanks of the Technical Section be tendered for their excellent work, with mention of the fact that their duties include an arrangement with the American Coommittee.

The motion was carried.

Mr. Dawe: The Technical Association notified us in July that they had appointed a committee, headed by Mr. Tucker, with the assistance of Mr. Herbert Spear, and Mr. George C. Spence, to act on a joint committee with the two Associations on the question of testing moisture in pulp. Mr. Slack has been in touch with the committee, and any work that has been done, I take it, is the result of negotiations between them.

Mr. Crossley: I would like to draw attention to a form of pulp which has been giving trouble in samples. That is very wet pulp. In the samples of pulp shipped a little while ago, we had but little more then thirty per cent of air-dried pulp. It was poplar, and one of the most difficult forms of pulp I have ever tried to sample. You could not put any pressure on it, without having the water drip right out of it. I don't know just what could be done, but we would have to find some way of drying out the pulp, and that might be put in a class by itself. I think pulp under thirty-five per cent would require special treatment.

Statistics.

The Secretary: Mr. Burns and I had a talk about the work of this Committee last week. We feel that the original idea of having a Committee on Statistics was in the days when we had no machinery for dis-

tributing the facts about the industry. Since then we have developed a Publicity Bureau, which is keeping the members very well posted on any matters regarding the data, etc., and, therefore, we ask that we be relieved of any further work, as we feel that we are maintaining a useless branch at the present time, because the very work that we started out to do, is being carried out in a far better way by the Publicity Bureau of the Association.

Mr. Stephenson: Mr. Chairman, before passing this step entirely, I would like to remark that this Committee, while it was in action, was very active, and for the past couple of years previous to the present year, when this work was taken over by the Association office, we were treated to a very full report, and some excellent work was done in collecting data and preparing curves, and a great deal of work along that line, which should not be passed without the thanks of the Section and I would like to make such a motion.

Carried.

(Discussions of papers read will follow in next issue).

SPANISH RIVER MILLS ANNUAL BANQUET.

A feature unique perhaps in Canadian industry, but which has become a regular institution with the Spanish River Pulp & Paper Mills, is the president's banquet, held once a year, to which members of the executive and heads of the various departments of the mills at Sault Ste. Marie, Espanola and Sturgeon Falls, are invited. In addition to providing a pleasant social evening for those in responsible positions with the company, the privilege is also presented for the interchange of valuable ideas, and the outlining of the company's activities and prospects for the coming year. The management claim that this annual gathering has been one of the most effective means in maintaining the very favorable relations that exist between the officers and workers. By this means a satisfactory understanding is arrived at between the department heads and the executive which, in turn, is extended to the individual worker.

The fifth annual banquet was held in Sault Ste. Marie last month and the guest list was extended to include heads of neighboring industrial concerns, prominent business men of the district, and in addition, Senator Gideon Robertson, Minister of Labor, and Hon. Beniah Bowman. Addresses were delivered by President G. H. Mead of the Spanish River Company, the government ministers, and by speakers from each of the company's plants, who were chosen by lot as special representatives.

President Mead spoke of the very satisfactory relations that had been maintained between workers and employers throughout the year. He said that the annual gathering was held for the purpose of bringing forth the company's policies and ideals for the year's works, and to bring about a closer association with the men on whom the company depended for its operation. It was the company's wish, he said, to instil into each mind that an endeavor was being continually put forth to give honest return for every dollar made. Production of the mills, he continued, as 625 tons of newsprint, 500 tons of ground wood, 230 tons of sulphite and 40 tons of board, daily, which in all represented 20 per cent. of Canada's production and 8 per cent of the production of the American continent.

Company's Development.

Some interesting light was thrown upon the company's development by Col. Thomas Gibson, the company's legal adviser. While the company's past had been a troublesome one, he stated, it had been an honored one, and the organization had grown into one of the largest of the Dominion. In 1894 the first ground wood mill was built, and in 1901 the first sulphite mill at the Sault, with a capacity of 8 tons a day. In 1913 the three companies at the Sault, Espanola and Sturgeon Falls were united.

Hon. Gideon Robertson commented favorably upon the spirit of harmony and co-operation evident within the ranks of the company's workers. He endeavored to impress upon the gathering the interdependence of every class of society and capital. This was the very basis of modern society, he declared. Speaking of the progress that had been made by the government in providing for labor he said that the one million dollars a year for ten years had been set aside for technical education because workingmen had come to realize that by becoming skilled workmen they could give better service to their employers and to the nation. There were now eight thousand teachers giving technical courses, and 60,282 workmen were in attendance.

In connection with the establishment of a plant council, which it is understood the management of the company have in view in addition to their other advanced benefit schemes for workers, the Minister of Labor stated that the value of such a council was exemplified by the results of the coming together of the railway officials and their employees, resulting in six men being appointed to represent each party at a hearing of the matters in dispute.

Hon. Beniah Bowman emphasized the need of forest conservation to offset the depredations upon the forest resources of the province by the constantly expanding pulp and paper industry. He called attention to the work of reforestation now being carried on by the government in Norfolk county, where some 1,600 acres of waste land had been replanted with maple trees.

PORTLAND "ARGUS" DEAD AT 118 YEARS.

Portland, Maine, January 24. — The "Daily Eastern Argus", the oldest daily newspaper in Maine, passed out of existence with to-day's issue. It will be succeeded to-morrow by the "Portland Herald", published in the same plant, but by a new company, in which these financially interested in the Argus have been reinforced by a number of local business men. The Argus has had 118 years of uninterrupted existence.

The Great War Veterans Association of Sault St. Marie at a recent meeting passed a resolution upholding the application of the Spanish River Pulp and Paper Mills Co. Ltd., for more land from the Provincial Department of Lands and Forests. The resolution sets forth that the company had been very prominent in building up the district, including Espanola and Sturgeon Falls, and had been considerate of returned men. Also the company had been one of the fairest in dealing with its employees.

"If you think you won't have an accident, ask the man who had one, then think safety," says the Safety League.

RAILWAYS WANT 24 TON MINIMUM ON NEWSPRINT.

The Annual Meeting of Pulp and Paper Traffic League was held at the Windsor Hotel, Montreal, January 27 and 28, 1921. An enjoyable feature of the meeting was the luncheon on the 27th, when the Canadian Pulp and Paper Association entertained the League at the Engineers' Club.

President Hurlbut called the meeting to order at 11.15 a.m., January 27th. This session was occupied largely with routine business.

At the afternoon session the question of railway wage scales and working agreements and their effect on freight rates was discussed. It was pointed out that this subject was being actively agitated throughout both Canada and the United States at the present time. The Executive Committee was directed to keep in touch with it and take any action it might deem necessary properly to protect the interest of the pulp and paper trade.

The effect of the McCaul-Dinsmore decision upon the adjustment of claims in Canada was brought up and statement made that it was understood the Canadian Manufacturers Association had the matter in hand.

The remainder of the afternoon session was devoted to a very comprehensive review by President Hurlbut of the conditions which had led up to the filing of the following important cases involving rates on paper into the West and Southwest:

Minnesota and Ontario Paper Co., et al., vs Northern Pacific Ry., et al, Docket No. 11950.

Lake Superior Paper Co., Ltd., et all, vs Ahnapee and Western Ry., et al, Docket No. 11981.

Wisconsin Traffic Association vs Chicago and North Western Ry., et al, Docket No. 12108.

At the opening of the Friday morning session, President Hurlbut summarized briefly the complete review of the Western rate situation which he had placed before the members on Thursday afternoon. He pointed out that as a result of these cases, there will probably be three sets, or scales, of rates established on paper in the West. In fact, there is a tentative understanding between several parties to the cases that this plan will be adopted and that newsprint paper will be accorded the lowest scale of rates, printing and wrapping paper, an intermediate scale, and writing and toilet paper will be subject to the highest scale of rates. The questions of descriptions, minimum weights and mixtures have also been discussed by Mr. Hurlbut with representatives of the initial Wisconsin lines, and some features tentatively agreed upon.

The Western roads purpose proposing an increase in the minimum weight on newsprint to 48,000 lbs., in connection with the revision of Western rates. This was discussed at the Friday morning session and many objections were expressed. The conclusion was reached to defer final action until a meeting of the League (or of the members who are going to intervene in these Western cases) which will probably be held a week or ten days prior to the hearing. In the meantime, members who are interested in the question should make an investigation to determine what increase, if any, they can consistently agree to.

As a result of the full discussion of the Western rate situation, it was understood each member present would give careful consideration to participating, by intervention, in one or more of the formal complaints.

The question of valuation clauses in various Western lines' tariffs was raised, but it was pointed out that this would be definitely settled by the Commission's decision in the Western paper rate cases.

Just prior to adjournment of the morning session, there was a frank and full discussion of the apparent inactivity of the League during the past year. The reasons for this were quite thoroughly understood by most of the members, but it was agreed that conditions are now such that there should be greater activity on the part of the League and more co-operation between the members through the channels provided for by the League. In connection with this increased activity on the part of the League, it was pointed out that it would be most desirable to increase the membership, and President Hurlbut appointed each member of the League a committee of one to do his utmost toward bringing new members into the organization during 1921.

At the afternoon session there was brought up for consideration, a letter from Mr. R. S. Kellogg, Secretary of the Newsprint Service Bureau, inquiring if the present was an opportune time to reissue his newsprint freight rate book. It was the consensus of opinion that conditions were such as to make this inadvisable at the present time, and it was understood Mr. Campbell would so inform Mr. Kellogg and give him the detailed reasons for this conclusion.

The question of claims for damage to paper was discussed quite fully. Special mention was made of the large number of cars with leaky roofs now in service. The necessity for more rigid inspection was emphasized, and it was the consensus of opinion that each member should make it clear to the railroads from which his mills receive equipment, that under present conditions the paper mills feel justified in insisting upon equipment which is actually "fit for paper."

In connection with a discussion of the Canadian Demurrage Rules, it was concluded it would not be advisable to agitate the question of having the rules brought more nearly into line with those in effect in the United States.

The Secretary was directed to ascertain and inform the members by circular letter, the status of the proposed loading rules which were the subject of several conferences during 1920, with representatives of the railway inspection bureau.

After careful consideration of the manifest charge now being assessed by Canadian roads, the following was adopted, and the Secretary was directed to present this protest to the Board of Railway Commissioners for Canada and to the Canadian roads:

"Unanimously resolved and adopted that the Pulp and Paper Traffic League protest to the Canadian carriers and to the Canadian Railway Commission, the petty and annoying charge of 11c per shipment now being assessed by the Canadian roads at the Border for preparing Customs manifests on inbound traffic, for the reasons that this and similar clerical work is, and heretofore has been, part of the transportation service, and is amply provided for in the freight charges. See Canadian Pacific Tariff E-2945, Supp. 93, C. R. C. E-3280, Supp. 93, and Grand Trunk Tariff C. R. 386, Supp. 4, C. R. C. E-4219, Supp. 4 originally effective November 1st, 1920."

The election of officers for 1921 resulted as follows: President, A. H. Campbell; Vice-President, W. D.

Hurlbut; Treasurer, E. L. Meyers; Secretary, T. T. Webster.

Executive Committe.—The foregoing officers and J. F. Dougherty, C. C. Furgason, G. E. Griffith, A. D. Huff, Guy Tombs.

In his remarks, upon taking the chair, President Campbell stated that at the next meeting of the Executive Committee, he will bring up the question of having the League prepare a reliable list of paper manufacturers, showing the location of each mill engaged in the manufacture of each grade, the name of the company manufacturing same, and the daily normal production.

COURAGEOUS IN ENGLAND AND FRANCE.

The remarkable courage and cheerfulness of the laboring classes of England and France in the face of poverty, privation and unemployment was warmly extolled by Mr. Howard Smith, of the Howard Smith Paper Mills, in speaking to the Pulp and Paper Magazine of his recent trip abroad.

Mr. Smith was in France during last November, and in London, England, in December. In neither country did he observe any revolutionary tendencies.

He paints heart rending pictures of the devastated districts of France and expresses glowing admiration for the cheer and good will with which the men, women and girls of that country are undertaking the gigantic task of putting in shape the reclaimed lands.

In Amiens, in Peronne and in Albert he received never-to-be-forgotten impressions of women and children living in crude huts, in a bleak, barren, war-stricken country — a landscape dotted with white crosses. But already, he states, a remarkable improvement has been effected.

In London, as in France, Mr. Smith perceived no symptoms of labor unrest though there was much unemployment and consequent suffering. No less than 240,000 returned soldiers out of work was the estimate given. The retail stores seemed to be extremely busy, in spite of very high prices.

Mr. Smith noted a widespread change of sentiment in favor of protection. Many who were Free Traders before the war have changed their view and especially among the laboring classes. One "Soap Box Orator" was heard in an impassioned plea for protection which was widely cheered by the surrounding throng. Mr. Smith feels that England wants this policy and that it is sure to come.

With regard to the Pulp and Paper industries, Mr. Smith states that the mills were quiet in England while he was there and that they are so now according to reports received from that country.

With regard to trade conditions in this country, he states that things are commencing to improve. Very little business is being transacted with the States, a condition which he attributes to the rate of exchange. With regard to future prospects, Mr. Smith expressed himself as unable to prophesy.

"The paper business is the servant of other business," he says. That is to say, if general business conditions are good, merchants must buy wrapping paper to wrap up their wares. On the other hand, if trade is quiet, there is more demand for the finer printing papers for advertising."

As for paper prices, Mr. Smith states that they have reached rock bottom. No lower prices are possible.

PLANTING FOR PULP AND LUMBER.

By Great Southern Lumber Company, Bogalusa, Louisiana.

In carrying into effect the forestry policies of the Great Southern Lumber Company, they set to work early in the Autumn season of 1920 to collect seed cones of several varieties of pine. It was necessary to find out how to get these seed by doing it as specific directions for harvesting pine seed are hard to find.

In case of loblolly or old field pine seed, this Company advertised in all the local papers that they would pay at the rate of $3.00 per pound for seed well cured and thrashed. There were no takers. For the Company, this was fortunate because the actual cost to the Company for about one thousand pounds of the variety has been well under $2.00 per pound.

In case of longleaf, one probably could have contracted with us at around $2.00 per pound. No one seemed to want the job. We were lucky again as the 4,000 pounds collected by ourselves cost about 50c per pound.

Planting this considerable quantity of seed is now engaging the Department of Forestry of the Company. More than 2,800 acres of cut-over land has already been sown to three varieties: loblolly, slash and longleaf. Because of clean logging the unfenced and unplowed area is covered rapidly by the crews employed to broadcast the seed. 1-1-5 pounds of longleaf seed are used per acre and the process of broadcasting the seed costs 15c per acre.

In case of the 800 acres fenced in 540 acres of the inclosed portion was plowed. The plowing was done with one-horse turning plows in the Summer by farmers after the crops were laid. Rows eight feet wide with a few plowed furrows on each row was the method used. This plowed area was planted to loblolly or old field pine at the rate of about 3-5 pounds per acre. The seed was drilled on the plowed row at a cost of 32c per acre. This cost, of course, did not include the cost of plowing and fencing.

All this planting has been done on land where there are but few seed trees, and is experimental. The Company will in the main depend on natural seed fall to reforest their cut-over lands.

Our chief enemy to be overcome in restocking cut-over lands, either by natural or artificial means, is periodic woods grass fires. In case of longleaf pine, hogs run a close second. In order to bring the planted seed in quick and ready contact with the mineral soil the dead grass was burned ahead of the planting. This provides protection to the young plants for about one year. In the meantime fire lanes and other precautionary steps will be taken in order to provide all the protection which can practically be given until the seedlings reach that stage where further precaution will not be so necessary. The Company is well aware of the risk which is being taken in losing seed by feeding birds and rodents, insects, etc. There were few, if any examples or experiments to follow, however, and we will know after we have tried.

The Bently timber limits and mill at St. Martin, N.B., have been taken over by the Pejepscot Pulp & Paper Company, from A. F. Bentley & Son, Ltd., and A. F. Bentley, ex-M.P.P. All the Bentley holdings in the eastern section of St. John county, with exception of their general store, are reported included in the transfer.

FIBRE BOX BUSINESS FOR 1921.

(From "Fibre Containers" January 1921.)

In times like the present we begin to appreciate the great value of statistics and charts to guide us by furnishing indications of what the future has in store. And, strange to say, men who assume a pessimistic attitude toward business for 1921 have refused to cooperate in the gathering and publishing of data which would be of great assistance to them and others in making plans for the future.

We think that more fibre boxes will be used in 1921 than were used in 1920. But we are not in a position to make an accurate guess without records of the production or consumption in previous years. It is known to everyone that statistics and charts would indicate a steady increase in production and consumption of fibre boxes from 1914 up to 1921. Now this natural increase or evolution will continue and will probably be hastened by the present conditions. If we had the data to make a chart we could tell approximately when the consumption of fibre boxes would reach the highest previous level.

Every firm should have its own business chart. If the firm's increases in production have been proportional to the increases in consumption in recent years, then they may furnish an accurate indication of the future. Moreover, without charts for comparative purposes a firm does not know whether it is advancing or slipping back in the industry. Like a city and its population the city is slipping back if it does not have the proper percentage of increase. Even though there is a percentage of increase in a firm's business that percentage is not sufficient unless it equals the increase in consumption of all the similar products manufactured. From your books you can get your monthly production and sales figures and plot them.

How long the present slump will last is uncertain. It is beyond our control. A readjustment of prices is rapidly being made. From observation we believe that merchants in smaller cities have already made readjustments and these in the larger cities will do so this month. In some instances prices have been cut below cost of replacement in order to stimulate business. Where there has been profiteering especially in raw materials replacement values of merchandise will be lower than in 1920 but this will not hold for all lines. However the January sales should show the lowest prices that we may expect to see. From February to April, when replacements are made, price will again become normal and will be in accordance with the cost of the merchandise to the retailer.

Most of our present troubles were due to profiteering. Foreign markets afforded great oportunities and made possible the exorbitant prices at home. We have seen what can happen and we should devise legislation to prevent repetition should we be unfortunate enough to engage in another war.

Everyone has to suffer with the profiteers. In fact, the profiteers are the good fellows today, because they can make the greatest price reductions. But with inventories made and books closed for 1920, the old goods will be turned over quickly. We will be ready for a fresh start and a return to normal market conditions.

We look forward to a heavy increase in the consumption of fibre boxes when the replacement of merchandise begins in earnest. Unless the slump in business affects the total wages materially, business will become normal and the consumption and production of fibre boxes will soon assume their normal increases.

U. S. NEWSPRINT REVIEW FOR DECEMBER.

The increase in the production of newsprint for December, 1920, over December, 1919, amounted to 2 per cent for total print and about 6 per cent for standard news, according to the Federal Trade Commission.

The increase for December 1920, over December 1918, amounted to 24 per cent. total print and 26 per cent for standard news.

Mill stocks of both total print and standard news increased during December, 1920.

In addition to the stocks given above 144 tons were reported on hand at terminal and delivery points on December 31, 1920.

The idle machine time reported to the Commission was 923 hours less than that shown in November. No lost time due to labor conditions was reported by newsprint mills.

The imports of newsprint for November, 1920, were 1,982 tons more than for November, 1919. The exports for November, 1920, were 499 tons less than for November, 1919.

The imports of mechanically ground wood pulp for November, 1920, were 1,904 tons less than for November, 1919. The exports of domestic wood pulp were 246 tons more than for November, 1919.

Stocks of rolls in the hands of jobbers at the end of December were 134 tons less than the stocks in the hands of the same jobbers at the beginning of the month. Stocks of sheets were 747 tons greater at the end of December that at the beginning of the month. The net increase in the total stocks of newsprint in the hands of jobbers at the end of December amounted to 613 tons.

Commitments to sell roll news were 8,584 tons greater than commitments to buy. Commitments to sell sheet news were 919 tons less than commitments to buy. Total commitments to sell both rolls and sheets were 7,665 tons greater than commitments to buy.

Publishers' stocks increased 10,128 tons during the month. The average daily tonnage used during December was 104 tons less than the average used in November.

Publishers' stock and transit tonnage on December 31st, represented slightly less than 47 days supply at the existing rate of consumption.

Eighty-five publishing concerns held about 70 per cent. of the tonnage on hand at the end of the month.

The domestic consumption of standard news by metropolitan dailies using between one-half and three-fourths of a million tons annually for December, 1920, when compared with December, 1919, shows that the consumption for the month of December for both years was approximately the same, and increased slightly more than 23 per cent for December, 1920 over December, 1918.

Average Prices Paid by Publishers.

The weighted average price of contract deliveries from domestic mills to publishers during December, 1920, f.o.b. mill in carload lots for standard news in rolls, was $5.969 per 100 pounds. This weighted average is based upon December deliveries of about 50,000 tons on contracts involving a total tonnage of approximately 370,000 tons of undelivered paper manufactured in the United States.

The weighted average contract prices based on deliveries from Canadian mills of about 24,000 tons of standard roll news in carload lots, f.o.b. mill in December, 1920 was $5.770 per 100 pounds. This weighted aver-

age is based upon the December deliveries on contracts involving slightly more than 69,000 tons of undelivered Canadian paper. The greater number of these are short-term contracts expiring before 1921.

The weighted average market price for December of standard roll news in carload lots f.o.b. mill based upon domestic purchases totalling slightly less than 12,000 tons was $7.854 per 100 pounds. This weighted average may be less than market quotations on account of contract relations, quantity discounts, mill stock ownership and other causes unknown to the Commission.

U. S. WOOD PULP REVIEW FOR DECEMBER.

Pulp Production.

The following is a tabulation by the Federal Trade Commission of the production:

	Production for the month.
Ground Wood Pulp	146,718
Sulphite, News Grade	62,357
Sulphite, Bleached	41,911
Sulphite, Easy Bleaching	4,369
Sulphite Mitscherlich	6,549
Sulphate Pulp	9,804
Soda Pulp	30,179
Other than Wood Pulp	640
TOTAL — For all Grades	302,527

Total stocks of all grades of pulp in the mills on December 31 amounted to 172,649 tons. Mill stocks of Easy Bleaching Sulphite, Soda Pulp, and other than wood pulp decreased during the month. All other grades increased.

Ratio of Stocks to Average Production.

Comparing the stocks on hand at the domestic pulp mills at the end of the month with their average daily production based on the reports covering the years 1917, 1918, and 1919, the figures show that:

Ground wood pulp stocks equal slightly less than 28 days average output. News grade sulphite mill stocks equal slightly more than 7 days average output. Beached sulphite mill stocks equal slightly less than 4 days average output. Easy bleaching sulphite mill stocks equal less than 5 days average output. Mitscherlich sulphite mill stocks equal less than 11 days average output. Sulphate mill stocks equal slightly less than 16 days average output. Soda pulp mill stocks equal slightly more than 5 days average output. Mill stocks of "other than wood pulp" equal about 3 days average output. Total mill stocks of all grades equal slightly less than 16 days average output.

DISTRESS IN SWEDISH PULP AND PAPER TRADE.

The Stockholm correspondent of the London Times writes about acute distress in the Swedish pulp and paper trade, newsprint being alone excepted.

The writer says: "The crisis in the paper and pulp industries has become more acute during the last week or two. The renewal of the contracts between the millowners and their workmen which expired at the end of the year, is still in suspense.

"In view of the depressed conditions of the trade, the owners have decided to reduce production in order to relieve the market. They are prepared to reduce their working days to three or four a week rather than dismiss half their workmen.

"Although the prices of paper and cellulose have fallen considerably, very few sales are taking place and hardly any shipments are being made, with the exceptions of small deliveries in connection with the outstanding contracts. Reduction of production is considered the only means of meeting the crisis, and the Federation of Pulp Factories proposed at their last meeting to limit their output by general agreement.

"Printing paper alone continues in demand, and the mechanical pulp market is comparatively less depressed. On the whole the pulp market, however, is more or less at a standstill. By a combined limitation of output, it is hoped to prevent over-production and to avoid the disorganization of the trade, with consequent further unemployment. For Swedish commerce the question is of great importance, pulp being, next to timber, the principle article of export."

A GOOD TIME TO CLEAN HOUSE.

(Correspondence to the Editor.)

Annapolis Royal, N. S., February 7, 1921.

In the face of the enormous loss we have suffered recently in our standing timber supply through the ravages of the bud worm and fire, why grind up our wood which can not be replaced in less than a century and sell pulp at today's price **when a short shutdown of the mills for much needed repairs would be more in order?**

The present surplus of pulpwood is simply the result of a temporary readjustment of business, an attempt to salvage some of the worm killed timber, and the drop in price of lumber which caused a diversion of logs from lumber to pulpwood. As soon as this present stock is used up, **wood and lumber will cost more than ever.**

Shut down and repair your mills and buy all surplus wood offered, as the end of our standing supply is in sight, and every indication points clearly to big business in the very near future.

The history of the pulp and lumber business shows that in the past prices have very frequently been **below the cost of replacement.** This has simply been caused by an over-production of these commodities and in spite of the fact that our timber is a rapidly wasting asset and can not be replaced in this generation.

The time is now here when the paper mill owner and lumber manufacturer will no longer ruthlessly sacrifice what remaining timber supply he may have and sell the product of his mills at less than a fair profit, which for the future must include very much increased cost for protection of his holdings from the ravages of insects and fire as well as much longer hauls for his logs on account of the remote location of the remaining supply.

Higher prices for land, lumber, and paper will materially reduce our per capita consumption, curtail waste, and prolong the life of our forests.

Owing to Canada's enormous loss from the spruce bud worm and fire, an embargo or export tax on the shipment of all Canadian pulpwood will be compulsory.

Frank J. D. Barnjum.

If a man wishes milk when traveling in the forests of Caracas, South America. Mother Nature supplies him most abundantly from the cow-tree. This product has not only the exact appearance but all the qualities of cow's milk.

News From Europe

(Special Translations for the Pulp & Paper Magazine.)

A German on "Russian Business"

To Germans who hope for trade with Russia Dr. W. Hd. in the Papier-Markt tells them facts which spoil the "dream", or picture of the working-class and business Utopia. There is no business to get, because the Bolsheviki have made no effort to produce. Bolshevism destroys, annihilates, without creating. In Russia men are living for the moment, knowing that the day must dawn when there will be no single thing left to exploit. Certainly there is no thought of exploiting the boundless unscratched mineral wealth—the gold, silver, platinum, coal—for there is neither capital nor machinery for the purpose, and corn, the chief product of the country, is the possession now of the new States, Ukraine, the Baltic States, and Finland. There is always the obstacle that business with Russia would not be an exchange of goods, since the Soviets have none to sell, and, even if they had, could Germans trade with charlatans who might pay them in money stolen from banks and private concerns?—Der Papier-Markt, January 20, 1921.

Paper Mills in Denmark.

The output restriction scheme is now in operation in all Danish mills, which work only five days out of the week.—Finsk Pappers-Och Travarutidskrift, January 15, 1921.

The Pulp Market in Sweden During 1920.

Trade has steadily fallen off in a year marked by extraordinary fluctuations in prices. Early in 1920 the active demand caused quotations to rise, but, as a result of the general depression, they began to drop in October, and now stand at about 850 kr. per ton for easy bleaching sulphite, and about, and about 750 kr. for strong sulphite. The official export figures are not yet available. It is estimated, however, that exports of bleached sulphite amounted to 45,000 tons of unbleached sulphite to 540,000 tons dry weight, or 585,000 tons in all, compared with 561,325 tons in 1919. Export of bleached and unbleached sulphate amounted to about 142,000 tons dry weight. — Affarsvarlden, January 5, 1921.

German Competition.

A correspondent who has just finished a tour of the paper markets in Sweden, Germany, Holland, England, France and Belgium, seems to think that by degrees the German paper industry is getting into its stride, and though the influence on the markets in pulp and paper is not yet apparent, it will duly make itself felt. In Hamburg it seems, optimism is general. The most notable thing in this letter is that Germans are working with prodigious energy to recover their lost position. —Finsk Pappers-Och Travarutidskrift, December 31, 1920.

The Germans on "Dumping" Paper.

"The task of our Export Bureau," says the Papier-Zeitung, "is very difficult. If the export price of paper is fixed too low, we shall hear of German "dumping"; if, on the other hand, it is too high, we shall be accused of profiteering." —Papier-Zeitung, January 16, 1921.

"We Germans, it is said, learn nothing from history. This may be true, for everywhere one is trying to bring about a fall in prices. It seems that industrial circles have not grasped the consequences clearly." With the fall in prices and deflation the paper industry will be gravely dislocated.—Friedrich Schwiers, Wochenblatt fur Papierfabriktion, January, 22, 1921.

The Paper Industry of Czecko-Slovakia.

The popularity of the new Czecko-Slovak government is an interesting feature of the market reports from many countries. This popularity is not so much political, as an affair of advertisement and pushing by press-agents, but it has something like a bullish influence on Bohemian industry, which is probably not free from exaggeration.

Th following from a Norwegian journal shows how difficult trade is under present economic and customs' regulations:—

Bohemia proper had 51, Slovakia 6 large paper mills. During the war and in the times after it, the competing neutrals and also the Entente countries got a big start of the Czech industry. Yet in spite of the colossal costs of production and freights, Czecho-Slovakia can export paper because of the low valuta. With the rise of the Czecho-Slovak state, new frontiers were formed and markets find themselves with a very restricted field for exploitation. This is a great obstacle to the Czech paper industry. Local demand is slight and the hight freight rates to Bohemia make competition with the Bohemian industry impossible, and the Czech mills are forced to rely chiefly on the Hungarian markets. In addition to newsprint and writing papers there are considerable export possibilities for other sorts; the home demand is covered by two-thirds of the restricted production, and exports of the remaining third is regarded as essential for the existence of the paper industry. Statistics show that in spite of the difficulty of exporting paper, and other commodities, the mills must have disposed of important stocks, for they are now under the necessity of importing raw and auxiliary materials from abroad.—Teknisk Ukeblad, December 17, 1920.

EXPORT PAPER TIED WITH DAWSON.

About one thousand five-hundred (1,500) spectators crowded into the Victoria Rink to see a very interesting round of the Pulp and Paper Hockey Schedule.

The first game was between Howard Smith Paper Mills, and the Abitibi Power and Paper Co., resulting in four goals to four.

The second game between C. F. Dawson and the Canadian Export Paper Company was easily the finest game of hockey played by this league in this season. The Canadian Export winning a well deserved victory by six goals to two. The Canadian Export by winning this game have now tied with the C. F. Dawsons' for first place.

Riordon won out by five goals to two, the score indicating their supremacy over the McFarlane team.

League Standing.

	W.	L.	D.	Pts.
Canadian Export	5	1	1	11
C. F. Dawson	5	1	1	11
Howard Smith	2	2	3	7
Riordon Paper	3	3	1	7
McFarlane Sons & Hodgson	2	4	1	5
Abitibi Power and Paper	0	6	1	1

PULP AND PAPER NEWS

Mr. Hugh S. Eayrs has taken over the management of the Macmillan Publishing Company of Canada, Limited, succeeding Mr. Frank Wise, who tendered his resignation at the annual meeting held a few days ago. Mr. Wise has been manager of the publishing house for the past 16 years. Mr. Eayrs is well known in Toronto, having been employed in newspaper and magazine work in this city for some years before he joined the staff of the Macmillan Company in October 1916.

Visitors to Toronto this week in connection with Ontario's lumber and pulp interests were Col. J. A. Little and W. H. Russell of Port Arthur and W. C. Maginnes of New York.

The capital stock of the Dryden Paper Company, Limited, has been limited to $3,000,000 under the Act respecting the Licensing of Extra Provincial Corporations. J. B. Beveridge of the town of Dryden, in the district of Kenora, has been appointed the company's attorney.

The Republic Flow Meter Company of Canada, Limited, which specializes in meters for pulp and paper mills, had an excellent exhibit and demonstration of their product at the recent motor show in New York. The exhibit was in charge of Mr. Storey and Mr. Cunningham of the Toronto office.

Mr. W. G. H. Logie, who, since his return from overseas service, has been associated with his father, Mr. James Logie, Toronto representative of the Canada Paper Board Co., Limited, has been appointed Ontario agent for the National Gum and Mica Company of New York and will have his office in Room 312 Foy Building, Front Street, Toronto.

Mr. V. T. Haney and Mr. Alex. Gillies, of the Toronto office of the Rolland Paper Co., Limited, are spending a few days at the Quebec mills of the company.

NEW MILLS FOR BRITISH COLUMBIA.

According to an announcement by the provincial registrar of companies in Victoria, British Columbia is to have another big pulp and paper enterprise. This is the Prince Rupert Pulp and Paper Company, Limited, which has just been incorporated with a capitalization of $4 000,000 to manufacture paper on a large scale in Northern British Columbia. The head office of the company is in Vancouver.

With a capitalization of $15,000,000 the Harrison Lumber and Pulp Company has been granted provincial registration. The company, which is headed by Sir Douglas Cameron and the Rat Portage Lumber Co., will start work almost immediately on the new pulp mill, which is to be erected at the mouth of the Harrison River, with a capacity of sixty tons of kraft paper per day. The initial cost of the plant at Harrison will be $3,000,000.

The company's plans include the construction of a pulp mill, and possibly a paper mill at Kitamat.

Walter R. Rapp, formerly of the Arthur R. Rapp Company, will represent the Invincible Paper and Pulp Corporation in the vicinity of Chicago. Mr. Rapp will call on paper jobbers and converters only. He will operate under the name of Walter R. Rapp Co., Conway Bldg., Chicago. Mr. Rapp will handle the Invincible's line of Ground Wood specialties, Newsprint in rolls and sheets, Novel News, Half Tone, Writings, M. F. Book, Hanging and Tissue.

The capital stock of the Canadian Pulpwood Corporation, Limited, has been increased from one million dollars to one million five hundred thousand dollars issuing 5,000 shares of one hundred dollars each.

THE PULPWOOD SITUATION.

As a result of a decided hesitancy on the part of the dealers and consumers in their respective unwillingness to sell or buy, the pulpwood market has developed into an appalling deadlock. Confidence, the pillar of commerce, seems to have crumbled under the pressure of opposing anticipations. The consumers are looking forward to still lower prices which they don't regard as being anywhere near a normal level. They, therefore, are trying to induce dealers to liquidate their large accumulations which it may be impossible for them to hold for any length of time. On the other hand, the dealers have yet in mind the higher prices they paid for pulpwood and therefore, despite the added expense of holding stocks, prefer to hold them rather than accede to the bids of consumers. Moreover, middlemen dealing in pulpwood are exercising restraint on the assumption that a general resumption of activities in the industrial world will shortly bring about a period of demand and consequently they will be able to sell with the upward trend. They feel confident that the mills depending on them for pulpwood will sooner or later need to replenish their gradually decreasing stocks. Paper is a constant necessity and manufacturers are not going to keep their mills idle in order to influence the ones upon whom they depend for their raw material when there is a demand for their product. To attempt such a move would be foolish.

In any event, the deadlock must soon be broken and it seems within reason to assume that the break will occur in the ranks of the smaller dealers who are less able to hold out indefinitely for an increase in demand whose coming is problematical.

Bankers on whom some dealers depend, have no desire to enter into a game of chance. They point out that these dealers can do better in the end by accepting a slight loss rather than wait too long. Even if a dealer were to hold back in the hopes of taking advantage of the first few advancing points of a rising market, it is questionable whether the gain would compensate the accumulated charges on interest alone.

With this probability in view, it is very possible that there will be a resumption of activity in this market as well as the paper industry within the approaching weeks of spring.

Technical Section

REVIEW OF RECENT LITERATURE.

A-18. Determination of the acidity of alum solutions. I. BELLUCCI and F. LUCCHESI. Gazz. Chim. Ital., **49**, 216-41, (July 10, 1919); Chimie & Industrie, **4**, 771, (June 1920). In the industrial prepn. of $Al_2(SO_4)_3$ or of alum for the manuf. of paper or the mordanting of fabrics it is necessary to check up frequently the acidity and the Al_2O_3 content of the liquors. As it is important that this be done rapidly volumetric methods must be used. They are based on the reactions:

$$H_2SO_4 + 2NaOH = Na_2SO_4 + 2H_2O$$
$$Al_2(SO_4)_3 + 6NaOH = 2Al(OH)_3 + 3Na_2SO_4.$$

To a measured amt. of soln. is added 2 cc of **n** H_2SO_4 and the acidity is titrated with **n** NaOH, using methyl orange as indicator. If **a** cc are used the free acidity is equiv. to **a-2** cc. If **a** is less than 2 the free Al_2O_3 is equiv. to **2-a** cc. If **a** = 2, the liquid is neutral. Phenolphthalein is next added to the titrated soln. and then 5 cc of $BaCl_2$ soln. (to prevent the formation of basic Al sulphate). The soln. is diluted to 200-500 cc and **n** NaOH is added to a permanent pink coloration. Let **b** = total no. of cc required for the 2 titrations. A second sample is then treated with 2 cc **n** H_2SO_4 and 5 cc $BaCl_2$ soln. and dild., and about 1 or 2 cc less than **b** are quickly run in. The soln. is boiled for 5 min., cooled, and the titration completed. If **c** cc are used, the combined Al_2O_3 is equiv. to **c** ÷ **a** cc. —A.P.C.

B-3. What can be done to prevent destruction of our forests. Paper, 11-4, 23, (July 7, 1920); 11-3, (July 14, 1920); 13-5, (July 21, 1920); 17-9, (July 28, 1920). The various stages in the destruction of forests by fire are described. The operations of fire protection are divided under 3 main heads : prevention, detection, control. Each of them is discussed in turn. Owing to its very nature and magnitude, the task of fire protection should be carried out co-operatively by timber-owners, State govts., and the Federal govt. The legislation required for really effective fire protection and reforestation is discussed in detail.—A.P.-C.

C-4. Pulpwood reclaimer. Can. Chem. J., **4**, 196 (July 1920). The pulp wood reclaimer is a machine for handling pulpwood blocks from storage. The main principle consists in retaining the angle of repose of the block pile, so that the blocks can come into the conveyor as needed. A bottom carriage runs on a portable track on the ground. Connected to it is a boom lying at approx. the angle of repose of the pile, with its upper end resting on the crest of the pile on a small truck. This boom, by means of idlers, carries chains which drag down the slope of the pile and pull the blocks into a portable conveyor at the base of the pile. The chains have pointed attachments set at such an angle that they will engage the wood and set it in motion. The reclaimer can be used as a stacker if necessary, being built as it makes the pile.—A.P.-C.

E-2. Sulphite waste liquor utilization. RALPH H. McKEE, Ph.D., Columbia University, N.Y. City. Pulp & Paper, **18**, 715-8, (July 8, 1920); Paper, 21-3, 30, (July 21, 1920). See also, Paper, **24**, 584-6, (1919); Pulp & Paper, **17**, 581-2, (1919), **18**, 81, E-2, (Jan. 22. 1920); and Paper, **26**, 368-72, (1920), Pulp & Paper, July 8, 1920. A description of the Ekstrom process for sulphite alcohol and the process devised by the author wherein the SO_2 and SO_3 are not removed before fermentation. Figures are given for the cost of production in a 100 t. sulfite mill. The fuel value of the residual solids after fermentation is sufficient to evap. the liquor and leave a substantial surplus for generating heat or power.—A.P.-C.

E-2. The utilization of sulfite waste liquor. PAUL RAZOUS. L'Industrie Chimique; Papier, **23**, 134-5 (June 1920). Brief notes on a few of the uses of sulfite waste liquor.—A.P.-C.

E-2. Utilization of sulfite waste liquors. Anon. Chem. Trade J., **65**, 168, (Aug. 16, 1919); Chimie & Industrie, **4**, 813, (June 1920). Notes on the utilization of sulfite waste liquor for the prepn. of alcohol, fodder, fertilizer, mordants, azo dyes (of theoretical interest only), and S dyes.—A.P.-C.

E-4. The resistance of filling materials for absorption towers to the passage of gases. F. C. ZEISBERG. Chem. Met. Eng., **21**, 765-7, (Dec. 31, 1919); Chimie & Industrie, **4**, 773, (June 1920). Summary of expts. carried out to det. the press. required to circulate a given vol. of gas per min. through an absorption tower of known dimensions filled with known materials and through which a given vol. of water per unit section is circulated. The results show that stoneware fillers offer less resistance and leave more room for circulation of the gas than do quartz or coke.—A.P.-C.

H-5. The bleaching of papermaking fibers. FRANK. Papeterie, **42**, 491-9, (June 10, 1920), 544-8, (June 25. 1920). A brief discussion of the relative merits of bleaching powder and electrolytic bleach (NaOCl), with a few words on bleaching by means of $KMnO_4$.—A.P.-C.

L-5. Cellulose phthalate: its preparation and properties. HAROLD A. LEVEY, Color Lab., Bur. of Chem., U. S. Dept. of Agriculture, Washington, D.C. J. Ind. & Eng. Chem., **12**, 743-4, (1920). Hydro-cellulose is prepd. by passing Cl into glacial AcOH until it is colored yellow, and heating cotton with abt. 6 times its wt. of this acid soln. at 70°C for 1-3 hrs. The cotton has then been reduced to an impalpable dust, and is washed free from acid and dried. 10 parts of the modified cellulose are treated with a soln. (at 70°C) of 30 parts of phthalic anhydride and 2.5 parts of fused $ZnCl_2$ in the least possible quantity of diethyl phthalate, for 24 hrs. at 70°C. The product is washed free from solvent and reagents and dried **in vacuo** at a temp. not exceeding 70°C. It is practically insol. in the usual org. solvents and slightly sol. in Schweitzer's reagent.—A.P.-C.

K-12. Formation of paper on the Fourdrinier wire. Papeterie, **42**, 595-7 (July 10, 1920). Transl. of art. in Paper, **25**, 579-81, Nov. 19, 1919. See Pulp & Paper, **18**, p. 143.—A.P.-C.

K-12. The manufacture and care of Fourdrinier machine wires. H. LINDSAY. Paper, 19-20, (July 7, 1920); 16, 28, (July 14, 1920). A brief description of the manuf. of Fourdrinier machine wires, comprising raw materials, wire drawing, annealing, weaving the wire, measuring and cutting, soldering and stitching, stretching, inspection, packing and shipping. Pointers are given on the proper methods of storage, handling and using the wires so as to avoid any unnecessary wear which would shorten the life of the wires.—A.P.-C.

K-15. Investigations in coating raw stock at the Bryant Paper Mill. ELBERT G. MILHAM. Paper, 15-6, 34, (July 28, 1920). The importance of cooperation between chemist and mill depts. is discussed. At the Bryant Paper Mill this resulted in the standardizing and controlling of the phys. properties of the raw stock for coating which enabled the paper mill to turn out better and more uniform stock. The methods of testing the paper are described.—A.P.-C.

K-18. Manufacture of jute board. JOHN PFISTER. Paper, 16-7, (July 21, 1920). P. advises the use of container clippings in jute liner fillers. To prevent the peeling of the liner, get the liner as short as possible, then run it on the bottom of the sheet as it passes through the wet end of the machine so that each couch will have the opportunity of knitting the liner tighter to the filler. Under these conditions 0.004½ liner should be sufficient. H. P. requirements of machines, jordans and beaters under stated conditions are given and a plea is made for the publication of more information of that nature from all mills.—A.P.-C.

M-9. Cutting transportation costs with motor trucks. GEO. H. CRYAN, Paper, 23-4, (July 21, 1920). A brief discussion of the advantages to be derived by paper mills from the use of motor trucks outside and electric trucks inside.—A.P.-C.

M-0. Modern testing apparatus for pulp and paper mills. F. M. WILLIAMS. Paper, 25, 32, (July 21 1920). See also Paper **24,** 586-8, (1919); Pulp & Paper, **18,** 80, A-4 & 5, (Jan. 22, 1920). A brief discussion of the importance of testing materials and supplies, and more especially pulp, in pulp and paper mills, together with a description of Williams' Standard Pulp Testing Outfit.—A.P.-C.

M-0. An efficient combustion recorder. Paper, 25, (Aug. 4, 1920). The Mono Corporation of America are putting out a combined CO_2 and CO recorder. If used without the CO supplement, it may be used to record SO_2.—A.P.-C.

N-4. Economy in the boiler room. N. P. WINCHELL Jr. Paper, 13-4, 32, (July 28, 1920). Besides the possibilities of increasing combustion efficiency, there are 5 important items which should be watched: 1) Prevention of soot and scale from covering the heating surfaces of the boiler. 2) Prevention of air leaks and infiltration into the boiler setting. 3) Stopping steam leaks from boiler, pipe lines, pumps, etc. 4) Installation of proper instruments in the boiler room. 5) Keeping sufficient boiler room records. The importance of each of these is discussed.—A.P.-C.

N-0. The Ulrici steam separator. Papeterie, **42,** 554, (June 25, 1920). In the Ulrici separator the steam is made to impinge vertically downwards on a baffle plate, the water and dirt being drawn off at the bottom and the separated steam going upwards, thereby effecting a complete and efficient separation.—A.P.-C.

N-5. Storing and handling fuel. N. P. WINCHELL Jr. Paper, 19-21, (Aug. 4, 1920). Pointers on the proper methods of storing and handling coal so as to cut down losses to a min.—A.P.-C.

O-3. Lime and barium carbonate as water softener. C. A. MEHRING. Chem. Met. Eng., **21,** 629-32, (Nov. 19, 1920). Chimie & Industrie, **4,** 783, (June 1920). The raw water is treated with a satd. soln. of CaO. $CaCO_3$ settles out in the tank and the water containing an excess of CaO is sent to a conical tank containing $BaCO_3$, where $BaSO_4$ is pptd. The water is filtered through a special sand and gravel filter thus freeing it from sulphates.—A.P.-C.

R-5. Post-war influence on paper manufacture in Italy. Paper, 21-2, (Aug. 4, 1920). An outline of the situation of the Italian paper industry at the present time.—A.P.-C.

R-5. European paper manufacturers face critical problems. THOMAS REECE. Paper, 22-3, (Aug. 4, 1920). An outline of the situation of the paper industry in Central Europe at the present time.—A.P.-C.

R-5. European paper production cut by coal shortage. PAUL BARTHOLOW. Paper, 9-10, 30, (July 14, 1920). An analysis of the coal situation in Europe, in so far as it affects the pulp and paper industries, showing that the production of the latter is greatly handicapped and reduced owing to shortage of the former.—A.P.-C.

R-5. Swedish sulfite mills reduce output to meet market. Paper, 11-2, (July 21, 1920). A brief analysis of the situation of the Swedish sulfite industry during the last 5 yrs., showing why the mills were forced to reduce their output in the early part of 1919.

R-5. Finnish manufacturers centralize the control of wood pulp supplies. Papermaker; Paper, 12, 32, (July 21, 1920). The Finnish industries dependent on wood as their raw material have formed the Central Federation of Finnish Wood Refining Industries, in which only the carpentry and cabinet-making industries, veneer and bobbins factories are not as yet represented. Its object is to watch over the common economic interests of the industries as regards proposed legislation and imports, customs and freight tariffs, and gen. com. policy. All sales are affected by the association and not by any of the separate firms. Its usefulness to the industries during these trying times is demonstrated by the general prosperity and greatly increased exports of its members.—A.P.-C.

R-6. Taking the load from the superintendent's shoulders. FRANK A. WINEGAR. Paper, 18, (Aug. 4, 1920). The papermill supt. is neither a chemist nor a color salesman. If the latter would only take the trouble to study the needs of the individual mills it would greatly help the supt. and at the same time would tend to create better feelings towards the color industry.—A.P.-C.

R-0. The paper problem in France. A. LECHATELIER, Prof. au Collège de France. Papeterie, **42,** 530-9, (June 25, 1920). A discussion of the present shortage of raw material for papermaking. According to the author the soln. lies in the establishment of a large no. of small mills in N. Africa to work up esparto into pulp which could then be sent to the paper mills in France, and in France to similarly work up reeds and the like.—A.P.-C.

UNITED STATES NOTES

While industrial wages generally throughout the United States have been revised downward, an exception to the rule of reduction is to be found at the plant of the Robert Gair Company, Brooklyn, manufacturers of paper goods—labels, boxes, cartons, paper packing cases and a great variety of paper containers. The Gair Company during the war period—in a space of three years—advanced wages about 128 per cent. It is to-day maintaining its wage scale at the peak, at a time when business is slack and when the result may be that the management will have to fall back on past profits to meet the cost of maintaining war wages. George W. Gair, president of the company, holds that it would not be fair to cut down the workers' rate of pay while living costs have not receded to any appreciable extent. "The wage readjustment in industry generally is inevitable, of course," says Mr. Gair. "What the employer can do is to make the readjustment easier for the worker to bear. And when we get back to the lower level of prices I think the worker will be contented with the lower wage. He was more contended before the inflation than during it. He was better off on the old $25 a week than on the $50 a week at the peak of high prices."

Reports current about the meeting of stockholders of the North American Pulp and Paper Company, held last week in New York, have it that a decision was taken by vote for a dissolution of the company and the formation of a new concern, to be known as the Saguenay Pulp and Paper Company. The old concern was an American Company and had to pay both American and Canadian taxes. Details covering changes in the par value of the stock of the new company and the exchange of shares will be made soon after the presentation of the annual report within a few weeks. Reorganized as a Canadian Company, the concern will need to meet only Canadian taxes.

All bids for government paper supplies for next year received recently by the joint Congressional printing committee have been rejected. It was announced that the committee regarded the bids as unsatisfactory and that new bids would be called for.

A recent issue of the Bureau of Foreign and Domestic Commerce Daily Trade Reports contains a communication from Vice Consul Thorling, stationed at Rangoon, Burma, to the effect that a big bamboo-paper pulp plant is to be opened in the Pegu District, Burma, by F. W. Heilger & Co., who are the managing agents for the Titaghur Paper Mills Company, Ltd.

Miss Mary R. Cass, general manager of the F. N. Burt Company, Ltd., one of the best known paper box manufacturing establishments in the United States, was tendered a testimonial dinner recently at Niagara Falls, N. Y. on the occasion of her thirtieth anniversary in the service of the Burt organization. Officials, former officials, salesmen and representative paper box men, some of them coming from remote parts of the country, attended. The splendid record made by Miss Cass was referred to in glowing tributes by the Burt executives and others who spoke. In most of these speeches Miss Cass was credited with having contributed in a great measure to the growth of the Burt Company from an eight person affair to the present organization of 2500.

A ten per cent reduction in wages went into effect Monday at the plant of the Eaton, Crane and Pike Company, manufacturers of stationery at Pittsfield, Mass. The mills are now being operated five days a week. There are 900 employes.

The Lakeview Paper Company, successor to the recently dissolved Lakeside Paper Company, Neenah, Wis., has rearranged its finances and has well under way at present a mill reconstruction project. With the completion of the construction work now going on, the renovated and enlarged mill will rank with the largest in the Fox River Valley. Considerable new machinery is to be installed, including an immense concrete bleach-mixing beater with a capacity of 10,000 pounds. The big machine was constructed according to specifications prepared by the company's engineers, and it is one of the largest, if not the largest, of its kind in the country. The officers of the reorganized company are: L. L. Alsted, president A. J. McKay, vice-president; Louis A. Lecher, secretary.

At hearings held last week before the Ways and Means Committee of the lower house of Congress, representative paper manufacturers—men prominent in practically every branch of the industry—were given an opportunity to present their views on the tariff as it relates to the present situation in the paper trade. Many arguments showing why the manufacturers of paper in the United States should be protected against foreign competition were presented. The Association of American Wood Pulp Importers, though not represented before the committee, filed a brief taking a stand against the idea of imposing an ad valorem duty on pulp. If a duty must be enacted because of revenue requirements, the Association, according to the brief, would much prefer seeing the enactment of a duty on a pecific basis. It urges this on the ground that an ad valorem duty would be a great hindrance to the paper manufacturer buying foreign pulp, particularly since contracts closed at a fixed price involving shipments of pulp from Canadian mills or from abroad, extend over a considerable period of time and are liable to be affected by the occurrence during the life of the contracts of important fluctuations. S. E. Thomason, of the Chicago "Tribune", speaking for the American Newspaper Publishers' Association, urged upon the committee the importance of permitting free entry of newsprint paper from all foreign countries as well as Canada, claiming that the present print paper situation demands such action. "No tariff which could be imposed would cause an expansion in the newsprint industry", was Mr. Thomason's contention. He declared that production in the United States last year was only 70 per cent of the consumption of 2,144,000 tons for the year. He added that he believes the ratio will be lowered this year. The output of the Swedish, Finnish and Norwegian mills has proved so inferior in quality, said Mr. Thomason, that no fear need be entertained by American manufacturers of competition from that quarter, even if the Scandinavian product could be bought at $15 a ton less than the American.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, Feb. 12. — Business generally in the paper trade remains quiet, although there has been a slight revival in some lines. There is a tendency to postpone buying, which is looked upon as a mistaken policy on the part of the consuming public in view of the possibility of a sudden buying era setting in, with its usual corollary of an advance. Wholesale paper dealers say that there will be no further big cuts in paper, although there may be some small adjustments in some lines. Efforts of the manufacturers and jobbers at the present time are being directed toward the establishment of uniform price lists and these are rapidly being gotten on the desired basis, which will mean protection to the big as well as to the small printer or consumer of paper. Printers are coming to see that their profits are not as satisfactory on a low market for paper as when prices are firm and uniform. Without any spirit of combination, the trade is arranging a uniform price list for papers based on a fair margin of profit on costs and one which will offer protection to manufacturers, jobbers and consumers alike. For instance, at the present time, the price of superfine linen record is 60 cents per pound in carload lots. The practice of unloading has largely stopped, and all printers, big and little, pay the same price. Uniform prices on other lines will gradually be established, which will mean that the printer will know exactly where he stands when he is estimating on a job, while he will be without the fear of a competitor getting his paper at a lower figure. In the paper trade, as in other branches of commercial activity, it is argued that the general cost of production has been reduced very little and it is stated that the price of paper cannot come to a much lower point without jeopardizing the industry. One leading jobber states that there will be no further drop in paper and in his opinion next May would see the paper industry on a sound and fairly profitable basis for those engaged in it.

BOOK, BONDS AND LEDGERS. — While these adjustments are taking place as to price, trade in these lines is quiet and there is little demand for either book paper, bonds or ledgers. The mills are receiving comparatively few orders and their tonnage output is small. A number of the mills are taking advantage of the lull in business to make repairs and renovations. The jobbers still have large stocks on hand, and as a consequence are not placing big orders with the mills. The jobbers' orders are of small dimensions, but, in the words of one dealer, "big business is in the air and it will only be a matter of time before it materializes."

WRAPPING PAPERS. — There is a fair demand for both wrapping papers and paper bags, and large stocks that were on hand a few weeks ago are gradually being depleted under gradually increasing calls for paper and bags. Owing to some of the mills having been closed for a time, shipments from the mills fell off some, but jobbers now report no difficulty in getting all the stock they need. One dealer reported last month's business as being equal to the later months of the boom period.

BOX BOARD. — The box board industry is going through a very quiet period with most of the board mills running short time and the box-making mills likewise. Although a lot of inquiries are coming through for stock dealers say that no one appears anxious to close an order and those that are being booked are small. There are signs, however, that trade is going to pick up and normal buying is expected to be resumed by March.

KRAFT. — Few orders are being taken for kraft paper and the trade is extremely dull. Some of the mills are closed down entirely and Wayagamack has not yet reopened, although manufacture is expected to be resumed at the mill very shortly. Kraft pulp is quoted at $115. Kraft paper in carloads lots to Ontario and Quebec points is $11.50: ton lots $13.50 and in less than ton lots $14.50. To the Maritime provinces the price is slightly higher with the freight equalized on St. John and Halifax.

PULP. — While most of the mills are making the usual amount of chemical and mechanical pulp there is very little market for the product and the tendency is to hold off buying pending looked-for reductions in the price. The closing of the board mills in the United States has affected the output of the Canadian mills to a considerable extent, but by the time those reopen, which should be soon now, it is expected that something like normal demand will prevail and the market stiffen. No one appears to know just where the market is at present and there are no fixed prices for any line of pulp. Generally speaking, ground wood is quoted at from $80 to $90: bleached pulp at $140 and unbleached at $100.

NEWSPRINT. — Newsprint is moving fairly free and one occasionally hears of spot lots being offered at a figure below the contract price of 6½ cents, but such quotations are said to be "feelers" only and as far as can be learned have not resulted in actual deals. There is little spread between contract and spot lot rates on big sales, but the small buyer has to pay anything up to 10 cents for his requirements.

RAG AND PAPER STOCKS. — Mill buying of new cottons cuttings has been very limited. The paper manufacturers report very little need for rags as they are running under reduced time and not consuming a normal amount of rags. In the absence of any buying the price tone has been easy and most grades have shaded down perceptibly. No. 1 white shirt cuttings have been offered in small lots as low as 16 cents without stirring much interest. Old cotton rags continue low, but as there are very few rags being graded these days, shipments from collectors continue light. Any operations on the part of the mills should have a tendency to make prices much firmer. White envelope cuttings and soft white shavings have dropped down quite sharply in the past two weeks, while newsblanks is moving in smaller volume than for some time past. Magazines and books have also dropped

quite sharply and the paper stock market is very dull, except for an occasional small order from mills which are in immediate need of material.

	Per Cwt. F.O.B. Toronto
No. 1 shirt cuttings	$16.00—$17.00
No. 1 unbleached cotton cuttings	11.50— 12.00
No. 1 fancy shirt cuttings	8.00— 8.50
No. 1 blue overall cuttings	8.00— 8.50
Bleached shoe clip	11.00— 12.00
White cotton hosiery cuttings	12.50— 13.00
Light colored hosiery cuttings	10.50— 11.00
New light flanellette cuttings	11.00— 11.50
No. 2 white shirt cuttings	7.50— 8.00
City thirds and blues (repacked)	1.90— 2.00
Flocks and satinettes	.90— 1.00
Tailor rags	.60— .70
Gunny bagging	1.10— 1.20
Manila rope	3.50— 3.75
No. 1 white envelope cuttings	5.00— 5.25
No. 1 soft white shavings	4.75— 5.00
White blanks	2.00— 2.15
Heavy ledger stock	2.75— 3.00
No. 1 magazine	1.60— 1.75
No. 1 book stock	1.35— 1.50
No. 1 manila cuttings	2.25— 2.50
No. 1 print manila	.75— 1.00
Folded news	.75— .80
Over issue, news	1.00— 1.15
Kraft	2.25— 2.50
No. 1 clean and mixed papers	.50— .60

NEW YORK MARKETS.

New York, February 12. (Special Correspondence.) Raw material has furnished the most interesting feature in the markets this week. The sharp recession in prices on several descriptions of raw stock used by paper mills has been easily the outstanding development, and has tended to divert the attention of members of the trade from finished paper to the raw material situation. Wood pulp, both mechanical and chemical, has dropped considerably in price. Most grades of pulp are now available at lower prices than have prevailed in many a day, at least for the past several years, and while the market tone has steadied to an extent, indications are that prices will go off a bit further before the downward movement is definitely checked. Papermaking rags also have declined in price, especially new cotton cuttings which for a long time have ruled on proportionately higher levels than old rags, and recessions also have been recorded in old papers. In fact, the raw material market almost in its entirety has been on the downtrend.

The fall in raw material prices would seem to be the best possible proof that the paper industry is rapidly becoming readjusted to after-the-war conditions. This industry probably was the last, at any rate one of the last, to feel the depression which attacked business a few months ago. Even when paper mills found themselves in want of orders and when demand for paper decreased in relative proportion to that existing for varied manufactured commodities, prices for paper held up for quite a lengthy spell. It was inevitable, however, that prices should come down; this soon became pointedly apparent to manufacturers, who, after waiting unrewarded for a drop in raw material took matters into their own hands by reducing quotations on their own product. It did not require much time for raw material producers and dealers to see the "handwriting on the wall" and to follow the lead of consumers in cutting down prices to something nearer to a normal level. Paper manufacturers should feel highly gratified that they themselves were the ones to inaugurate the marking down of prices, and present indications are that they will profit by their action. The fundamental reason for the prevailing business dullness is that consumers have temporarily lost faith in the stability of prices, realizing, of course, that prices on practically all commodities were entirely too high and that declines would necessarily have to come about. As soon as prices on any article get down to more reasonable levels, the probabilities are demand for that article will quickly expand. This has been proven particularly in the textile field, where manufacturing and trading have increased substantially since prices were reduced to a point where buyers are not so fearful to cover their wants and to anticipate future requirements. The same condition will likely develop in the paper market, now that paper prices are getting down to where buyers will regain confidence. In this way, manufacturers should soon benefit by the sharp reductions in price of their product through the obtaining of a larger volume of business.

There has been little important change in the paper market during the week. Quotations in a majority of cases are maintained, and where such changes have occurred, they have virtually without exception been in a downward direction. Demand for any kind of paper or board has broadened but slightly, if at all. consumers and jobbers buy in retail fashion, placing orders only when in immediate need of supplies, and yet signs are not wanting that the lower prices now ruling are commencing to have effect. Inquiry from at least certain sources is increasing, and there is not so much reluctance shown by buyers in meeting the prices asked when they are in want of paper. Furthermore, there are some lines of trade that are beginning to take on a much livelier aspect, which is at least being reflected in the paper industry by buyers exhibiting more interest.

Prices hold generally at around previous levels. Spot newsprint is a little lower, sales down to 6 cents a pound for newsprint in standard rolls having been reported. The spot market is still easy in tone and there is a surplus of supply offered at the moment. On the other hand, the contract basis is well maintained and an interesting development is a statement made public by President Philip T. Dodge of the International Paper Company, in which he says that there will not be any reduction in contract prices of newsprint for some time to come, emphasis being placed on the continued high cost of manufacturing. Some take this prediction of Mr. Dodge as intimating there will be no cut in prices by the I. P. for the second quarter of this year.

The board market has quieted down after having experienced a flurry of buying by boxmakers soon after New Year's. Quotations nevertheless are holding, plain chip board being quoted at $50, or slightly lower, per ton at mills, and filled news board at $55.

GROUND WOOD. — The ground wood market is close to the edge of demoralization. There is no demand of important volume, and aside from transactions involving small quantities of pulp directly needed by buyers, business is practically at a standstill.



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So many prices are mentioned in different corners of the trade that it is extremely difficult to determine what ground wood really is worth. Actual sales of a carload or two have been recorded in certain instances down to $45 per ton at grinding plants, yet dealers declare this price is not truly representative of the market basis, it being stated that leading producers are asking $60 to $65 and that they are refusing to sell at the bottom figures at which "distress" lots are being disposed of. A majority of the trade feel that prices will firm up materially as soon as buyers resume operations on a more nearly normal scale. It is asserted that mechanical pulp sold at $45 and even at $55 and $60 is marketed at a loss to the producer, wihch leads to the belief that prices cannot long remain on such levels.

CHEMICAL PULP. — There is a lack of important activity in chemical wood pulp, and prices display an easy and unsettled tone. The sharp reductions announced early in the month by leading manufacturers have greatly unsettled matters, and quotations are so irregular that it requires a certain amount of guesswork to ascertain what market prices are. Dealers and mill agents themselves frankly say they do not know what pulp is worth, pointing out that it is very hard to locate buyers regardless of the quotations named, and the situation is absolutely devoid of an established price basis. Sellers in most cases are marking time and are doing little offering of pulp, feeling that when consumers really want pulp they will enter the market and that to endeavor to press buyers now would merely serve further to disturb conditions. However, some are trying to move certain stocks of pulp and the prices at which this supply is selling denote broad declines in price. Domestic news grade sulphite has sold at $85 a ton at pulp mills and there have been reports of some sales at this price delivered at consuming points. Domestic bleached sulphite is offered fairly freely at 6.50 cents a pound at pulp mills and some lots have been purchased for and 4.25 cents for foreign, while easy bleaching sulphite is to be had at 5 cents for domestic and 6 cents for imported.

Arrivals of foreign wood pulp at the port of New York this week included 2,195 bales from Rotterdam, 2,131 bales from Kobe and 1,600 bales from Yokohama.

RAGS. — Lower prices obtained on most grades of cotton cuttings used by paper mills, and certain kinds of old rags have decreased in value slightly during the week. No. 1 new white shirt cuttings are offered by dealers at 17 cents per pound at shipping points, new unbleached muslins at 13.50 cents, No. 1 washables at 7.50 cents, new slight silesias at 9 cents, fancy shirt cuttings at 9 cents and new blue overall cuttings at 9 cents. Roofing rags are moving in fair tonnage to some felt mills at a price basis of around one cent per pound f. o. b. shipping points. Old white rags are quotably steady, whereas thirds and blues are in an easy position and can doubtless be acquired at concessions from the price asked by sellers.

PAPER STOCK. — Slight declines in low grades of old paper have featured the market this week. Board mills which for a period of several weeks were moderately active buyers of mixed paper, folded newspapers and similar grades have mostly retired from the market, and as is usual when demand for such descriptions falls off, prices have weakened. Sales of No. 1 mixed paper to mills at 45 cents per hundred pounds at shipping points have been reported, while folded news has sold at 60 cents, No. 1 over-issue news at 90 cents and box board cuttings at 55 cents. High grades are moving in slight amounts and prices in most cases tend off. Offerings of No. 1 hard white shavings to mills at 4.75 cents and of soft white shavings of No. 1 quality at 3.75 cents have attracted few buyers, and purchases could doubtless be made at a quarter of a cent below these figures. Old books and magazines are selling in scattered directions at about 1.50 cents at shipping points.

OLD ROPE AND BAGGING. — Consumers exhibit but passing interest in old rope and bagging, and were it not for occasional sales of light tonnage the market would be at a complete standstill. Prices quoted by dealers range aroud 4 cents per pound on No. 1 domestic manila rope and at about 1.50 cents on No. 1 scrap bagging.

The "Irish Consulate-General", (Trade Dept.), New York City, has advertising in several New York papers directing the attention of American producers and shippers to the Irish market for paper and paper making material. Part of the advertisements contain the following legend: "Ireland purchases every year wood pulp, cardboard, strawboard, printing and newspaper, stationery and show cards at an estimated cost of $4,000,000. This valuable market has been practically an English monoply. Direct shipping between American and Irish ports should stimulate American producers and shippers to secure a share of this profitable trade."

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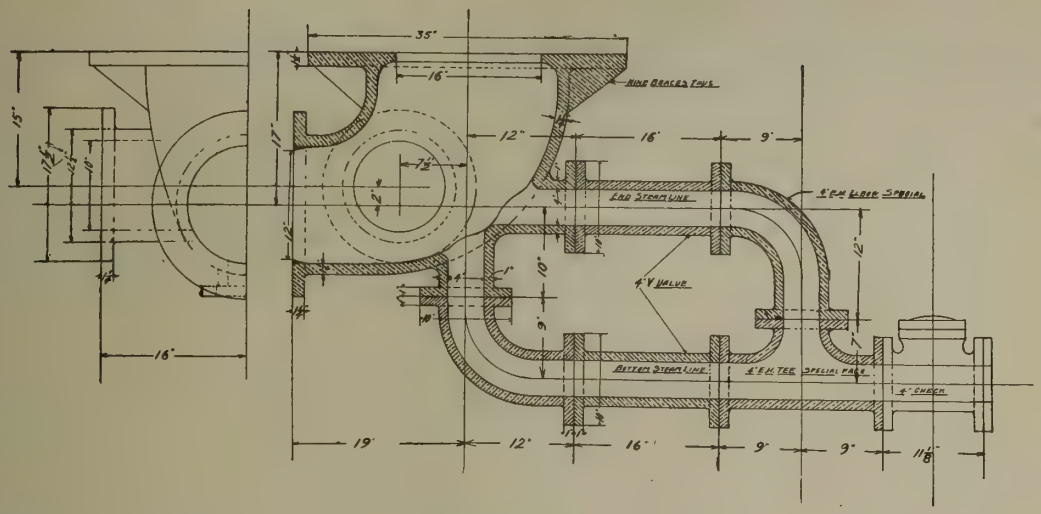
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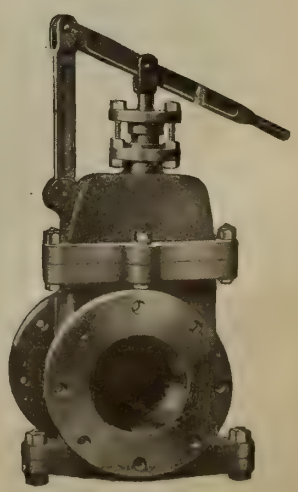
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ABOUT SECTIONAL DRIVES.

"Sectional Individual Motor Drive for Paper Machines" is the subject of Leaflet 1933, that is being distributed by the Westinghouse Electric and Manufacturing Company, East Pittsburg, Pa. The leaflet describes and illustrates the sectional individual motor drive, which has been successfully developed by the Westinghouse Company to assure increased production, decreased maintenance, greater reliability and durability in machines for the production of paper. The installation at the Gould Paper Company, Lyon Falls, New York, which is equipped with the automatic speed regulating system, is shown in this leaflet. A discussion of the operation of the control is given, together with an outline of its advantages.

WELDING CO. MAKES CHIP SCREENS.

St. Lawrence Welding Company Ltd., 138-140 Inspector Street, Montreal who are well known to the pulp and paper trade as boiler-makers and welders, and more particularly as manufacturers of tanks and dryers, are now manufacturing chip screens.

These welded chip screens are more of 3-16" iron wire, each and every intersection being welded with a smooth weld. The common mesh used is 3-4" by 3" long with a clear opening.

They also manufacture a similar type for pulp only with a smaller mesh. They have already turned out over 100 of these chip screens and are now working on a further order for 38. Mr. Barry, the general manager, states that they have lately received several large orders for welded pressure vessels and rivetted tanks and that they have at the present time enough work to keep their plant working at capacity to next June.

E. Forssell who has charge of the Pulp and Paper Department of the American Transmarine Company, Inc., 13 Park Row, New York City, has gone to South America to join the firm of Holmberg, Bech y Cia, Rio de Janeiro, Brazil.

William Beardmore & Company, Limited, whose steel works are at Glasgow and naval construction works at Dalmuir have opened a Canadian office at 285 Beaver Hall Hill, Montreal, in charge of Mr. Breen Kennedy, handling the following lines:—Steel shafting and forgings up to all sizes, small tools, jigs and fixtures, locomotives of every variety (steam, petrol and electric), flanging work of all kinds, sheets, ship and boiler plates and sections, water-tube, Scotch and locomotive boilers, steam turbo, Beardmore-Tosi Diesel and Beardmore crude oil engines, centrifugal and semi-rotary wing pumps.

The Engineering and Machine Works of Canada, at St. Catharines, Ont., report having shipped their first grinder to the Canada Paper Company, Windsor Mills, Que. This delivery is being followed by shipment of six Machines to Wolfe River Pulp and Paper Company, Rivière-du-Loup, Que.

They are also busy on several large orders and prospects are very good for the coming season. Visitors are always welcome at the plant.

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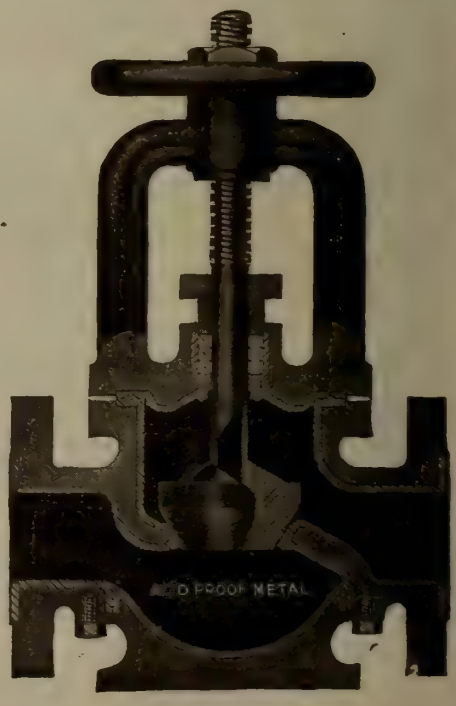
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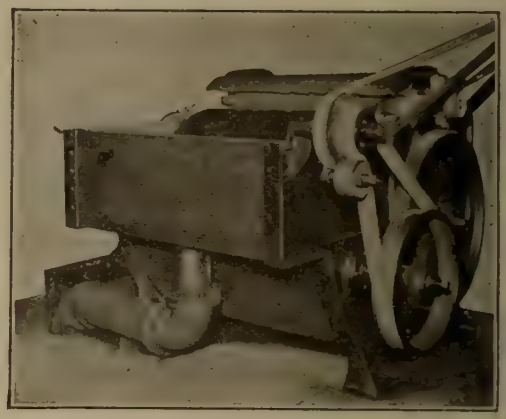
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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. **GARDENVALE. P. Que., February 24th, 1921.** **No. 8**

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal.
'Phone Uptown 7773.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

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-:- EDITORIAL -:-

ABOUT BURNING BRIDGES.

We are all familiar with the expression "Burning one's bridges", but this operation is usually supposed to take place after one has crossed the bridge. We occasionally find a case of such blank idiocy as to burn the bridge before crossing. The initials of that person are commonly assumed to be D. F. In the case we have in mind, however, we might add the third initial and call it D. F. G. which for politeness sake we shall say represents the Dominion Federal Government. The Dominion of Canada very largely must look to the product of the forest to pay for such materials as must be imported to be used as raw material for many of our industries or are otherwise necessary. While these are in some cases not major industries their operation is absolutely necessary because we must provide for balanced employment of the population. The forest is everywhere recognised as the back bone of Canada's manufacturing position. It not only provides employment in its mills for nearly thirty thousand people, but engages more than that number in its woodland operations. Further than that our railways, and particularly our Government owned railways, handle a large amount of freight in consequence of hauling both the raw material and the finished product and yet these same railways are causing annually enormous losses because they do not effectively cope with the problem of preventing fires along their right-of-way. An efficient commission, a Government commission at that, is in charge of fire protection along other railways which are required to comply with its order; but the Government's own railways do not come under the jurisdiction of its own commission. This is a most unfortunate and idiotic arrangement and the sooner it can be stopped the longer will be the life of our forests and the better will be the chance for the Government railways to pay their way.

One would not expect a painter to burn down the house he hoped to get the job of decorating.

CO-OPERATIVE RESEARCH IN PRACTICAL FORESTRY.

A curious but very important coincidence occurred during the Convention week of the Canadian Pulp and Paper Association. At exactly the same time that the Technical Section, meeting at the Ritz-Carlton Hotel, was discussing a plan for organizing on a co-operative basis, the research work of the pulp and paper mills in Canada, the Woodlands Section of the Canadian Pulp and Paper Association, meeting at the Windsor, were discussing similar action with regard to experimental work with new methods and apparatus in woods operations. This is most encouraging.

The decision of the Pulp and Paper Association to establish a Department of Research and appoint a director means that individual and disconnected efforts of a number of mills will be co-ordinated and duplication largely avoided, thus making for economy and efficiency. There is a similar situation in regard to the operations necessary in the production of wood, both in the growing and harvesting of the principal raw material of Canada's principal manufacturing industry. Several companies have tried out new types of equipment but few, if any, records are available which give an adequate statement of performance. It is as necessary to have complete and accurate records as it is to conduct an experiment with care. A comprehensive report of procedure and results is necessary for a correct understanding of the circumstances.

The technical men are a bit ahead of the woodlands men, but not so much as the encouragement given them should warrant. The foresters are to be congratulated on the rapid progress they have made in improving the wood situation at its source.

The fact that both sections of the C. P. & P. A. have approved the same method of work on this problem of research is a good argument in its favor. The woodsmen have some points in their program which should be carefully noted by the technical men. The general plan, as approved for a beginning by the Woodlands Section, is outlined in Mr. Anson's fine address which is printed in this issue.

It appears that not enough importance is attached to records of failures. Apparently the speakers, judging from the discussion, want to hear about the successful experiments only. As a matter of fact it is quite as important in any scientific or technical work to know the "how", "where" and "why" of failures. Complete information about them may often point the road to success and, in any case, will warn newcomers off the wrong road. If it is discovered, for instance, that a tractor will not operate on a certain grade or a certain type of road, surely the whole section wants to know that, so as to avoid the difficulties.

Surely, Convention Week 1921 has made a great contribution to the excellent work of the Canadian Pulp and Paper Association. New and important lines of action have been laid out and we may con-

fidently expect next year to bring good reports of progress in the direction of organized research work in both mill and forest.

A FOREST RANGERS' SCHOOL.

One of the finest suggestions that has come forward for sometime was the proposal made at the meeting of the Woodlands Section last month. That the wood using industries, in conjunction with the Province of Quebec establish a Forest Rangers' School was the proposition which started the discussion and it will be well worth the reader's time to turn to another page of this magazine and study the situation as it is there laid out. It is very appropriate that such a discussion should take place at this particular time when the general public as well as of those more vitally interested individually in such problems, are turning their attention to educational matters. The trend of education today is especially strong in the direction of vocational education. Schools where boys can learn carpentry, the machinist's trade, printing and book-binding, and girls sewing, millinery and housekeeping are becoming encouragingly common and the work they are doing is not only enabling these young people to do better work as employees, but they are inspired with greater interest in it because of their greater knowledge of it; and along with their increased efficiency because of their better training specifically for their work they are also developing keener intelligence and a better appreciation of the problems of production, of distribution, of society, and of government. In short, they are becoming better citizens. The improvement in their attitude towards citizenship will be the more marked if care is taken in explaining and emphasizing some of the fundamental opportunities and obligations of a citizen.

An appreciation of responsibility is not all that is required, however, for an efficient discharge of it. A man may be painfully aware of a debt without being able to pay it; a man may also be aware of the problems of production and management without being able to solve or even to study a problem effectively. The appreciation of this circumstance is one of the principal factors in the recent growth of vocational and technical instruction. Most of this development has by far been in connection with industrial centres and factory operations. The paper industry has not been without its influence and in fact has made very considerable progress in its organization of, and contribution to the education of the men in the mill. The industry has even gone so far as to appropriate thousands of dollars for publishing text books for the instruction of employees and the first volume of this work is now available and has met with general interest and praise.

But just as the mill operations have been improved without corresponding attention to the protection of the principal raw material in the forest, so the education of the forester and the woodsman has not received the attention that has been paid to the mental development of the mill man. From a discussion at the Woodlands' Section meeting, we are very pleased indeed to observe a change for the better. Interest is being taken in this important feature and we trust that the seed has been sown for what will eventually be a flourishing educational plant for those whose work is so necessary to the production of our principal manufactured product. A very able committee has been appointed to deal with the matter and the Pulp and Paper Magazine extends them its hearty good wishes and any assistance that can be rendered in their important work. They should find the financial burden lightened by the Federal appropriation for vocational education.

COBWEBS.

Kindly refer to the announcement on the Technical Section page.

Where could that shipment of pulp to New York from Rotterdam have been manufactured, we wonder.

The cost of construction will not interfere with furnishing the main room of that Forest Rangers' School.

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Woodlands Section Does Real Work

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The Chairman, Brigadier General J. B. White, presided, and when the minutes of the meeting held in Toronto, Dec. 8th and 9th, had been read and accepted, Mr. G. M. Porter, of the Woodlands Section of the American Paper and Pulp Association, was introduced.

Mr. Porter replied: I represent the Woodlands Section of the American Paper and Pulp Association, and would like to tell you something of what we in the American Section are doing along the lines you people are discussing today.

We have recently sent out questionnaires to all the pulp and paper companies, asking for information regarding their methods of operation, for results where they have experimented with new methods of carrying on their work, for results where new machinery has been installed, — in fact, we asked for detailed information on all the points which are of importance in connection with the woods operations and the management of pulp and paper companies.

These questionnaires are coming back to us now, and we are compiling the very interesting information which is received. When this is done, we will be in a position to be of great use to various companies desiring to instal new methods. For instance, if one company has experimented with the use of tractors, etc., and another company wishes to try them out, too, we will be in a position to give to this company information as to how the experiment has worked out in the other case. In this way, each company will have the benefit of the work carried on and the experiments made by the other companies in the same business. We will get from the companies co-operating in this way, lists of experiments they have tried, and informations regarding them. Our ambition is to develop what might be known as an International Forest Experiment Station, and we hope to have the co-operation of the Canadian Woodlands Section in this matter.

After completing the compilation of information obtained through the questionnaires, we are planning to select a certain number of experiments for which there seems to be the greatest demand, and, with the use of funds contributed by interested companies, we will be enabled to have these experiments carried out to a finish by the companies best adapted to do so. When such experimental work is completed along the definite lines decided upon, the results will be made public to all the members of the Section, or to the industry as a whole. Through Experiment Stations of this sort we hope to develop new ideas which will be of great value to the American Paper and Pulp Association, and I think your Section and ours could get together and do good work for the industry as a whole.

I think the suggestion made at the Toronto meeting was a good one: That was that an International Committee be formed, to consist of two members from your Section and two members from ours, for the purpose of collecting information with regard to experiments being carried out in connection with woodlands operations. This Committee was to prepare a digest of the information obtained, and copies were to be given to the companies supplying the information.

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Mr. DeCarteret opened this discussion, as follows: I would like to say that the meeting held in Toronto in December last was the first meeting of the Woodlands Section, of that kind, which I ever attended, and I got a great deal of good out of it. I found the discussions very valuable. We took up different matters with the men up there, in regard to forestry work in general, and among other things we discussed the various equipment being used at present. Personally, I think the time has come for us to get together in our work and share whatever information we may have obtained from one source or another. At this meeting I would like to get the views of people who have been using tractors. I am sure there are lots of other points we should be able to get together on also.

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I may say that the Quebec Forest Service has been collecting information to some extent, and we have also followed the course of experiments being made in different parts of the province. I understand that along the South Shore a few companies have started out with log haulers — (I believe the River Ouelle Company has been using a tractor). Some of these companies have been using maps made by foreign engineers, and have found that they could do so to advantage — in fact, it is necessary to have properly made maps for use in this connection. We endeavour to keep in touch with what is going on, the methods being followed, and we endeavour to co-operate with the lumbermen for the benefit of our forests.

We have recently passed new regulations reducing the diameter limit of spruce to 10 inches, and if the condition of the forest makes it necessary to make any further change, or to deviate from the regulations, we would be glad to send our forest engineers to investigate conditions. After such reports are received, we would be glad to make recommendations, and have the necessary Order in Council passed.

We have gone further. It is our great desire to co-operate with the limit-holders, and where we have been informed that companies have in their employ foresters, we have stated that we would accept inventories made by these foresters, provided we can check their figures to some extent. We are all working for the same purposes, and with these new arrangements we will be able to do a good work for the province. I believe that with open discussions at meetings such as this, we will eventually realize the aims we have at heart.

fidently expect next year to bring good reports of progress in the direction of organized research work in both mill and forest.

A FOREST RANGERS' SCHOOL.

One of the finest suggestions that has come forward for sometime was the proposal made at the meeting of the Woodlands Section last month. That the wood using industries, in conjunction with the Province of Quebec establish a Forest Rangers' School was the proposition which started the discussion and it will be well worth the reader's time to turn to another page of this magazine and study the situation as it is there laid out. It is very appropriate that such a discussion should take place at this particular time when the general public as well as of those more vitally interested individually in such problems, are turning their attention to educational matters. The trend of education today is especially strong in the direction of vocational education. Schools where boys can learn carpentry, the machinist's trade, printing and book-binding, and girls sewing, millinery and housekeeping are becoming encouragingly common and the work they are doing is not only enabling these young people to do better work as employees, but they are inspired with greater interest in it because of their greater knowledge of it; and along with their increased efficiency because of their better training specifically for their work they are also developing keener intelligence and a better appreciation of the problems of production, of distribution, of society, and of government. In short, they are becoming better citizens. The improvement in their attitude towards citizenship will be the more marked if care is taken in explaining and emphasizing some of the fundamental opportunities and obligations of a citizen.

An appreciation of responsibility is not all that is required, however, for an efficient discharge of it. A man may be painfully aware of a debt without being able to pay it; a man may also be aware of the problems of production and management without being able to solve or even to study a problem effectively. The appreciation of this circumstance is one of the principal factors in the recent growth of vocational and technical instruction. Most of this development has by far been in connection with industrial centres and factory operations. The paper industry has not been without its influence and in fact has made very considerable progress in its organization of, and contribution to the education of the men in the mill. The industry has even gone so far as to appropriate thousands of dollars for publishing text books for the instruction of employees and the first volume of this work is now available and has met with general interest and praise.

But just as the mill operations have been improved without corresponding attention to the protection of the principal raw material in the forest, so the education of the forester and the woodsman has not received the attention that has been paid to the mental development of the mill man. From a discussion at the Woodlands' Section meeting, we are very pleased indeed to observe a change for the better. Interest is being taken in this important feature and we trust that the seed has been sown for what will eventually be a flourishing educational plant for those whose work is so necessary to the production of our principal manufactured product. A very able committee has been appointed to deal with the matter and the Pulp and Paper Magazine extends them its hearty good wishes and any assistance that can be rendered in their important work. They should find the financial burden lightened by the Federal appropriation for vocational education.

COBWEBS.

Kindly refer to the announcement on the Technical Section page.

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The Chairman said:

Mr. Piché has pointed out the necessity for properly made maps if we are to use mechanical equipment in the forest successfully. We certainly have to have maps to give us the proper grades. We might go into the forest and look at an up-hill haul, and think there would be no trouble at all, — that the grade would be just so-and-so. Then when we get the road cut out, we find the grade is just twice as great as we had thought it was. This sort of thing could all be avoided by having properly trained men in the forests to give us our grades.

PRACTICAL PLAN FOR WOODS EXPERIMENT STATION.

By G. H. ANSON, Abitibi Power and Paper Co.

One of the principal items of the programme was this paper on the need and advantages of some manner of intensively and widely practiced experimental work, conducted in an effort to better the present methods employed in physical woods operations,— and the necessity for the maintenance of standardized, co-ordinated, uniform time study records of this experimental work in a suitable place common and convenient to all; and the outline of two possible plans which, by the adoption of either, would go a long way to bring this about.

Almost every other line of endeavour, such as farming, mining, manufacturing, construction, etc., has been put upon a power and mechanical basis. Every day, and many times a day, new inventions are doing away with man-handling methods. Is it not, therefore, up to us North-Americans, supposedly the equals of any progressive people on earth, to get busy and intensify, by co-operative action, our energies and thoughts to create better methods and tools for the harvesting of our forests? Must we wait for the age of the heatless houses, or some other age, before some one develops power saws, power swamping tools, and other mobile power driven tools of various kinds, — or shall we get together, quit talking, and do it now? If we are willing to admit that we are lagging behind, then the time has come when we can and should get out and make a definite start to alter this condition.

From several sources there have been suggestions offered, that an experimental station be organized, wherein already proposed new devices and methods of timber harvest can be tried out and developed. These suggestions tend to prove, in a measure that a realization of our situation has dawned. If such is the case, then, it is in order to formulate, without delay, plans which will best serve to bring these improved conditions, in a co-operative way. It is with the brief outline of two possible solutions of this situation that the balance of this paper has to deal.

At first glance, the easiest way to accomplish the desired result, namely, an experimental station for trying out tools and methods, would seem to be to organize a sample experimental station. After this has been organized, then assess the member pulp companies and timber operators, a certain sum of money each, based on and acording to the amount of their total annual production. Next, it would be necessary to elect a competent and disinterested party, preferably a technical man with practical experience, to operate this experimental depot.

It should, and would, be encumbent upon this technical man in charge, to surround himself with a competent staff and clerical force; then, to eliminate, as far as possible, any feeling of discrimination which might arise among the contributing parties. It would be further advisable to elect from the representatives of the member companies a governing board whose duty it would be to formulate policies of operation and see that all these, when carried out, would come within the appropriation available, and accruing from the assessments levied on the subscribing pulp and timber operators. These formulated policies should include, among other things, the investigation of new and varied methods of timber cutting, brush disposal, fire protection, log hauling, log loading and yarding, log booms, log towing in open water and slack water rivers, flying, cruising, logging railroads, and the new mechanical tools incidental to the conduct of new methods.

This Board should and would further provide itself with a set of governing by-laws, whereby the functioning of this experimental effort may be properly administered without unnecessary red tape, and these by-laws must and should absolutely define the responsibilities and obligations of this Board in order to eliminate that national, commercial pastime,— "Passing the Buck".

Next, the location of the Experimental Depot must be considered. The depot must be so located that the product of its effort may be utilized and marketed so that it may as nearly as possible be self-sustaining. and, secondly, it should be in a locality where as many different conditions exist as possible, to permit of as many varied experiments as can be tried. Thirdly, its location should further be such that it is easily accessible to the greatest number of subscribers, and their representatives, who will wish to visit it for experience and observations. In a general way, this outlines what must be accomplished to create a simple experimental depot.

Let us now consider one or two of the disadvantages and difficulties to be encountered in the formation and operations of such an experimental effort.

First, there would be no trouble in securing a charter for such an effort, nor in all probability would there be any difficulty in finding the right type of technical and practical man and the necessary staff and clerical force. No difficulty should be encountered in selecting a suitable board of control from the many bright and progressive men associated with this Section.

The first obstacle now presents itself, namely, the assessment of member companies on a pro rata basis. In experimental work such as is proposed, the tools and equipment are highly developed and are very expensive. For example, the best logging tractors cost approximately $10,000 each; mechanical caterpillar skidding tools, $12.000 each; adequate size flying boats of the modern type, $15,000 to $18,000; wireless phone installations, $1,000 to $2,500 per set; field power generating sets, $2,500 to $5.000; modern logging wagons, $600 each; power tree saws, $1.000 to $1,500 each, and so it goes. This means but one thing — that a very large appropriation is necessary before any real experimental work of value may be done. Under prevailing business conditions, it is doubtful whether this necessarily large amount of money could be paid out of the member companies' coffers. Again assuming that the money was avail-

able, it would be a difficult matter, after the money was spent for this equipment, to distribute the various companies' experimental equities for tax purposes and in the event of dissolution of the experimental depot project. However, the first consideration is the main one; the latter of miner importance. Overhead would also be proportionately very high.

The greatest disadvantage of a simple single experimental depot is the limitation of location. It does seem a feasible supposition that one place can be found where all conditions prevail that are encountered in woods operations, nor even a majority exist. Therefore, any experimental effort thus conducted would benefit but a few who possess similar operating situations. This would, of necessity, foster the feeling of discontent among the contributing companies and result shortly in a dissolution of the whole operation, due to the withdrawal of support, which would create a very decided lack of the necessarily large financial appropriation required to conduct the work.

There are several other minor objections, but no time need be taken to discuss them here.

The following is a proposed plan which seems much more feasible, and which is designed to eliminate the objectionable features involved in the idea of a single unit experimental depot. This proposed plan contemplates the organization of an experimental division or department of the Woodlands Section of the Canadian Pulp and Paper Association. In charge of this department, elect a competent technical efficiency engineer, who, in turn, shall surround himself with an adequate staff composed of experienced, time study men, and likewise a sufficient clerical force to handle records as they are assembled, with dispatch.

Next, as in the case of the simple single experimental depot, appoint a governing board who, in addition to formulating the policies for the activities of this department, as prescribed above, shall have the power and jurisdiction of apportioning the amount of experimental effort each of the subscribing companies shall accomplish within a given time, it being understood that no one company shall be called upon by this board to do more or spend more in the doing in a given period, than its pro rata quota. Further, it shall be the board's duty before apportioning this experimental expense and work to an individual member company to ascertain in advance whether the specific experiment to be attempted would here receive its severest test. When all this preliminary work has been done by the board, and the machinery recommended for purchase received on the ground, ready to operate, then the time study men from the experimental department of this section would be dispatched to the seat of the operation and commence an intensive study of the new method, carrying this study on for a sufficient period of time. When their field work was completed, they would return with the resultant data, which would be duly recorded in a standard and comprehensive manner and submitted to the same governing board. If the finding of the board, based on this report, is that the new method is a success, the finding could be printed in a concise form and distributed to the subscribing companies, who then may or may not adopt same, as they see fit. The records could then be filed for future reference. This is all there is to the organization.

Now, let us sum up the advantages of this form of proposed plan:

1st. It is easy to create, by a simple vote, such a subdivision or department of this Section. No charter is necessary.

2nd. Any number of clean-cut efficiency engineers can be had. No particular operating knowledge is necessary, although it would be a further advantage.

3rd. A staff of time study men is easier to procure than technical and practical woods operators, and are less expensive.

4th. It is just as easy to appoint a competent board for this plan as it would be for a single operating experimental depot.

5th. Filing and computing clerks are always available.

6th. Less money is required directly, and this only for technical and clerical work, for which we have standard records shown, properly filed and all in the one convenient place.

7th. The company members who are required to invest in experimental machinery still own this equipment for what it is worth, and can make proper distribution of the expense for tax purposes.

8th. Experiments of a great variety can be carried on under the most exacting conditions simultaneously, and a great amount of knowledge gained in a short time.

9th. The greatest of all obstacles, that of the feeling of discrimination, will be removed, and sincere cooperative effort result, which should make for the permanent support of the work by all, and yield the greatest net results. Therefore, does not this latter plan, with possibly some modifications or additions offer the best, easiest, and quickest way to start this experimental work?

There is undoubtedly much more to be said on this important subject. Possibly there are other and better ways and means to do this thing:—modification, or added ideas to be incorporated in either, or in both of the proposed plans of procedure. But that as it may, —the importance of something intelligently constructive being done along these lines must not be overlooked. I would therefore suggest that, at some proper time during this Convention, a Motion along the following lines be proposed:

> "That a Committee of five, including the Chairman, be appointed by the Chair, to investigate the advisability of immediately creating some manner of Woodlands Experimental Department or Depots, and this Committee shall be empowered to enter into preliminary negotiations with member companies to determine their attitude towards whatever plan or organization this Committee shall select as the best suited to accomplish an efficient Woodlands Experimental Department or Depot, without further delay, in the shortest time."

Gentlemen, this paper was started with the idea of sending it out to different men to get their ideas on the subject. I hope you will consider the whole matter, and see if we cannot come to some definite conclusion in this connection. I know that something of the sort would greatly appeal to myself and to a good many of my associates.

The Discussion.

THE CHAIRMAN: We have all listened with great interest to Mr. Anson's paper, and I think it would be a good idea to have copies made and circulated among the members, in order that they might pick out the various points raised, and study them. I may say that

I am heartily in sympathy with the whole idea, and think that the quicker action is taken along the lines suggested, the better.

MR. ELLWOOD WILSON: Mr. Chairman, I would like to say that I think this idea of Mr. Anson's is a most excellent one. I believe that there are a lot of companies carrying on experiments along similar lines, and they do not know that the same work has been done before, simply because there is no central point from which they can get the information they need. I think that by working out the idea suggested by Mr. Anson, such experimental work being carried on by the different companies could be co-ordinated, and we might get the combined experience of the different companies operating at present. We would hear of various mechanical appliances which have proven to be successful and labor-saving machines, and altogether, I think good would come of it.

Such co-operation might lead to the working out of a uniform woods accounting system, among other things, and this would be of great value.*

I think this is a big proposition and deserves careful consideration. I think we should not plunge into anything leading to a large expense without examining the proposition on all sides and from all angles. I would therefore suggest that a committee should be appointed by the Chair to consider this matter—a Committee from the Woodlands Section of this Association—and that this Committee be empowered to go into the question thoroughly with the American Committee, and that report should be made at the summer meeting of the Canadian Woodlands Section and also at the next meeting of of the American Section.

The summer meeting of the Canadian Woodlands Section will be held on the limits of the Riordon Company, when we get out in the woods, where we belong, and talk things over. The Committee would be able to study everything carefully, and it is too late to do anything this winter, I think the best thing we can do is to get everything ready so that we could commence next fall.

Mr. Chairman, I would like to suggest that a Committee be formed to look into this matter, and that it should consist of Messrs Kenny, Draper, and Anson. These are all good men to go into a matter of this kind: Mr. Anson on account of his technical qualifications, and the other two on account of their long and successful woods experience.

The Chairman added Mr. Wilson's name and the committee was elected.

A FOREST RANGER'S SCHOOL.

By G. C. Piché, Chief Forester, Province of Quebec.

When the Honorable Mr. Taschereau made his first speech as Prime Minister of Quebec, he inserted the remark to the effect that before long a Forest Rangers' School would be established. I may say that I believe the time has come for us to get this idea launched and realized. We have found, and I believe that all operators have found, that in the woods the spirit of the men has changed a great deal. The old lumber jack has gone, and the new men coming into the woods are not like the old ones—they do not work as well.

For instance, we find that the scalers are not always absolutely honest. A change should be made. I have thought that if we could educate new blood,—if we could produce a new class of men to take charge of things, to act as scalers, foremen, fire rangers, bush rangers, game wardens, etc., we would solve the problem. I think it would be a good thing for the Woodlands Section to study this matter and discuss the various points in connection with it. I may say that the Legislature is in session at Quebec, and if it is decided, after discussion in this meeting, that the time has come to launch this idea of a Rangers School, we might get an appropriation in the budget of the Department of Lands and Forests, and we could get the school started next summer.

I think it would be well for the government and the lumbermen to co-operate in connection with this school, and I think it would be advisable for this Section of the Canadian Pulp and Paper Association to appoint a Committee to go into the question with the government and discuss the matter thoroughly.

The Discussion.

MR. WILSON: I think the idea an excellent one, and I think it would be much better for such a school to be started under the auspices of this Association, rather than under the direction of the Government.

If the Government starts a Rangers' School, I foresee various difficulties, which could be avoided by having the school run by the industries in co-operation with the Government. If the school were carried on in this way, all questions of language and religion would be obviated; everyone in Canada would be free to attend, and we would have a thoroughly practical school teaching men the duties they would be expected to carry out as rangers, etc.

Rangers' Schools have been started in the United States. There is one in Colorado, and one in New York State, that I know of, and they have been successful. To my mind the training has been rather of a higher grade than the men needed. They were given a lot of theoretical knowledge, but it did not especially fit them for the kind of work to be done. I may say I have employed some of the men from these schools, and have knowledge of these points. I think they carry the idea out better in Sweden, where they have Rangers Schools at which the men are taught a bit of elementary surveying, so that they can pick up old lines and mark out boundaries. They are taught the elements of mathematics, and to scale logs and do simple calculations. They are given axes and saws to cut down trees, and they are taught to lay out roads, etc.

If we could start a school like that, and it would not cost anyone a great deal when the total would be divided up, I think it would be a fine thing. We could also, as Mr. Piché suggests, take up the matter of getting an appropriation from the Government.

The men trained in the school and passed as competent to carry on the necessary work, could find employment with the Government and with the various companies. If there is any one thing which will make for efficiency in woods operations, it is good, practical training of the men doing the work.

One thing we could do would be to pick out our best men and send them to a school of this sort to be trained during the summer months when we are not busy in the woods. I think it would be a fine thing if a school of this sort could turn out a class of honest scalers and

* The Newsprint Service Bureau is working on this phase of woods work.

useful foremen. Everyone with experience in the woods knows the lack of any sense of responsibility in the average foreman and scaler. They seem to have no real point of view, and no education. This could be given in a practical way. I don't believe in starting a Rangers' School and trying to turn out foresters. My idea would be to teach these men to handle an axe, saw, and peevy—to have them study the work they are expected to do, so that when they get in the woods they will be worth more to us.

I think it would be a good idea to pick out tried men, whom we know, and in whom we see possibilities, and send them to the school, and thus make them more valuable to themselves, to us, and to the Province as a whole.

MR. COOLIDGE (Bangor, Me.?: Mr. Chairman and gentlemen: it is quite a while since I had charge of a Rangers' School, but there are certain points which Mr. Wilson brought out which are well worth emphasizing. For instance, I would like to emphasize the importance of taking men who have been tried and tested. If a school of this kind is thrown open to the public, you don't get suitable men. I think the idea would primarily be to take good woodsmen, and make them more useful, to educate them for scalers and to develop them into foremen's assistants, etc.

I do not think the course needs to be a long one at all, as the men can get a good part of their knowledge through actual practice, but they need to be taught the essential things. I think that this is a very important question, and that a practical Rangers' School would do a lot of good.

In Colorado, where the school was for men in the Forest Service, we had much better results than in another school where the course was open to any boy 19 years' old who thought he would like to be a ranger. In that school they got a lot of town boys without the ambition to work, and who were not at all suitable pupils. I firmly believe it is necessary to pick the men.

MR. HENRY WICKENDEN: In regard to the Rangers' Schools in Sweden, I may say that these are more in the nature of finishing schools for woodsmen, than schools to teach men to handle the axe and the saw. Before the men enter the schools, it is necessary for them to have had a long apprenticeship with companies in operation, and they have to bring tickets from these companies and statements regarding their qualities and qualifications. These are finishing schools rather than schools where the men receive practical teaching such as has been mentioned.

In these schools there are courses covering elementary arithmetic, elementary surveying, and also methods of scaling. Then again there is certain work in connection with logging, culling, and general accounting.

The rangers, when finished, are placed in positions where they are expected to do accounting, etc., and to make careful reports on the distribution of work. These data are collected and are found to be very useful in connection with estimates of costs, etc.

Before entering such a school, I think the ranger should have an elementary education to start on, and be accepted on the recommendation of the companies in the province.

THE CHAIRMAN: I understand it is to educate young men to be scalers, cullers, cruisers, bush rangers, fire rangers, foremen, etc., and to fit them to take on the duties and replace others less satisfactory.

MR. PICHE: At the present time we are turning out forestry engineers, for officers. Now we want rangers, to act as sub-officers. I should think a man would not become a foreman immediately on leaving the school, but that he would take on a job as ranger at first, and then later on he would be fit to be promoted to foreman. I believe that a man who has gone through a course of study, and then works under a good man, would in a short time be able to act as assistant foreman, and eventually as foreman.

MR. KERNAN. If the Rangers' School takes in foremen, it seems to me it would be a very important thing. The foreman spends our money in the woods and he is certainly away beyond the stage of learning to chop trees, etc. I should think we would have to send tried men there.

It seems to me that an important thing would be to teach cullers more about culling and accounting: also something about cost systems, so that they can get their distributions and keep pay rolls, etc. It is very difficult to get a good culler, and it is very important. I think we lose more money through cullers than in any other way.

It should not be very expensive to get a school of this kind going, where cullers and scalers would be admitted. To me, it would not seem important to have the men taught surveying, as that is under the forestry engineer's department. If a line is worth running at all, it is worth running right, and the same thing can be said of all work of that nature. If we want information for use in connection with proposed dams, for instance, we want the right data, and, personally, I do not think a little bit of surveying would be much good. My idea would be to concentrate on culling, scaling, accounting, etc., and I think a school of that sort would be very valuable and could be run very cheaply.

MR. COOLIDGE: I think there is a lot in what Mr. Kernan has said. In the school in the West, to which I referred, the man who got the most out of the course was 89 years old, and had been a woodsman all his life. I don't think it is much use running schools to teach the men to chop and saw. They ought to be beyond that. I think the idea would be to take the men who have shown themselves to be interested and loyal, and teach them the things that they lack.

Another point which I think is important, is that the school ought to be handled as an administrative proposition rather than an educational one. It may not just fill the bill to take young fellows, with the idea of fitting them for the woods. I would say, take tried men and educate them in regard to the things in which they lack efficiency. The question could be asked of the woods superintendent: "What is it your foreman lacks?" or "What is it your sealers lack?" "What would you like these men to get?".— then those men could be taken and trained.

THE CHAIRMAN then named the following Committee to go into the matter thoroughly, and to cooperate with the government, if the Committee reports favorably:

Mr. G. C. Piché, Chief, Forest Service of Quebec;

Mr. R. Kernan, Donnacona Paper Company;

Mr. Ellwood Wilson, Laurentide Company;

Mr. Mack, of the Brown Corporation;

Mr. Arthur Graham, of the Ottawa River Forest Association;

Mr. H. Sorgius, of the St. Maurice Forest Protective Association.

MR. PICHE: I move that the Committee named by the Chairman, with power to add to their number if necessary, be empowered to meet with the Government

to make arrangements regarding a Rangers' School as soon as possible and practicable.

At a later point in the meeting, the Woodlands Section passed the following resolution, unanimously:

"RESOLVED that the Woodlands Section approves the formation of a Rangers' School under the auspices of the Section and in conjunction with the Provincial Government; and that a Committee approach the Government in regard to an appropriation."

ELECTION OF OFFICERS.

The following officers were elected for 1921:

Chairman: Mr. L. E. DeCarteret, Brown Corporation.

Vice-Chairman: Mr. W. McE. Bowden, Laurentide Company.

Councillor: Mr. B. F. Avery, Spanish River Pulp & Paper Company.

RESOLUTION ON RAILROAD'S RESPONSIBILITY

The Chairman of the Committee on Resolutions submitted the following:

"RESOLVED, that the Woodlands Section of the Canadian Pulp and Paper Makers' Association, recommend that all railways owned and operated by the Canadian National Railways System be placed under the jurisdiction of the Board of Railway Commissioners, in order that the same fire protective regulations promulgated by the Board for privately owned roads may be carried out thereon."

The Discussion.

MR. WILSON: This Resolution strikes me as being in connection with the most important thing this Section can handle at this particular time. You all know the situation, so there is no use going into detail, but in a few words, the situation seems to be this: The Dominion Railway Commission have taken steps to prevent fires on privately-owned lines, and we are all satisfied with the way they carried out this work. The C. N. R. does not come under the jurisdiction of the Board of Railway Commissioners, and on at least some of its lines the regulations enforced on privately-owned lines are not carried out. The result is that we have had a devastation of the lands along the lines of the Transcontinental. I have travelled over this line from Vancouver to Ottawa, and I am also in a position to say that at the Quebec end of their lines the destruction has been something awful. I want to say that in certain sections, the local officials co-operate with us in the work of fire protection, but the system as a whole has been destroying timber right and left. I may say that I think it is very short-sighted on the part of the C. N. R. because in many places they are burning up the only material they could hope to transport, and the government has been in the anomalous position of trying to prevent forest fires on one branch and setting them on another. I think it is high time something is done to put a stop to this sort of thing.

We have compiled figures showing the number of fires set since 1914 in the Quebec section. We have the number of fires, the numbers of the engines which set the fires, and the areas burned. I may say that two engines last year set 80 fires in one day. One set 34 and one 46. One of the engines was inspected the next day and was said to be in perfect condition.

Another thing I want to mention is that ties are burned whenever the section men take the notion, and the right of way is not properly cleaned up. I must say that the Government railway administration is ruining the forest along the right of way.

The Hon. Mr. Cochrane was approached when he was Minister of Railways, but we got no satisfaction. The present Minister of Railways, Hon. Dr. J. D. Reid, takes the same stand. I see there is present today another member of the Committee which approached the Minister of Railways, and he may tell you of our reception.

The present railway administration has absolutely declined to take the necessary precautions, and there is now only one thing to do: That is, to let the public know the situation and make these men in charge of the railway system see they have certain responsibilities. They have taken the position that they are operating a railway, and have no responsibility to the limit holders:— Let the limit holders provide protection if they want it. The difference between the C. P. R. record, and that of the C. N. R. is so great that any man looking at the figures can see what the situation is.

Privately owned railways give us no trouble now in regard to fires, but the C. N. R. sets fires all through the season and burns great areas of our timber. We have just completed an investigation of the line from Cochrane to La Tuque, and we have pictures showing miles and miles of land destroyed by fires set by the railway. This sort of thing shows a lack of business sense—a lack of ordinary common sense—that is appalling. There is no questioning the evidence of the damage done all along the line from Cochrane to La Tuque. As I say, we have pictures of the whole thing.

I understand that this question is coming up on the floor of Parliament at the next session, and whatever we can do to strengthen the hands of those who will be in this discussion should be done. I think a Resolution from this Section might have a very good influence. The public is beginning to be stirred up, and pressure of this kind should have a good effect.

MR. PAUL G. OWENS: Mr. Chairman, I do not know whether I should speak or not, but I wish to voice my appreciation of Mr. Wilson's remarks. I was present when the Minister of Railways was interviewed with regard to putting the government railways under the jurisdiction of the Board of Railway Commissioners, and the answer given was that the transfer of the G. T. P. was not yet completed, and that nothing could be done until the transfer was complete. Nothing has yet been done.

We had the record regarding the devastation wrought by the government railways; we made the appeal on the ground that the Government should take steps to conserve the resources of Canada; but nothing has been done to bring the government railways into line to work toward that end. I merely wish to emphasize the remarks made by Mr. Wilson, gentlemen, and to say that I am very strongly in favour of bringing the matter before the Government in the manner suggested.

The Resolution was carried unanimously.

DR. RUTTAN.

Temporary Chairman of Research Council.

Ottawa, Feb. 21—Dr. R. F. Ruttan, head of the department of chemistry at McGill University, has been appointed to succeed Dr. A. B. Macallum, as administrative chairman of the honorary advisory council for scientific and industrial research. The appointment, which was made at Saturday's meeting of the council, is a temporary one, made necessary by the impending departure for China of Dr. Mcallum, who some months ago, accepted the chair of bio-chemistry at McGill.

Chemical Reaction in Sizing Paper

BY W. E. BYRON BAKER OF THE YORK HAVEN PAPER CO.

Sizing paper in the beater depends upon the decomposition of rosin size solution in the beater by the action of a solution of an acid or a salt containing a large portion of acid in neutralized form. The size solution consists of sodium resinate with varying proportions of free rosin in suspension, depending upon the amount of soda ash originally used in the making of the size.

Decomposition of the Size Solution

The decomposition of the size solution consists of the liberation of free rosin finely divided condition, which takes place because the soda in the size solution has a stronger affinity for the strong mineral acid in the precipitating agent, because strong bases (e. g. soda) have greater affinity for strong acids than for weak acids, the former being dissociated into ions to a far greater extent than the latter are dissociated.

Two substances enter into sizing by the usual method, using alumn precipitant, namely, free rosin and basic aluminum resinate. This leads us to a consideration of the conditions influencing the character and composition of the size precipitate. It is evident that the precipitant which yields the bulkiest precipitate will be the most desirable from point of distribution of the given weight of size (rosin) among the fibers in the beater, so as to coat each fibre equaly. This is, therefore, a factor in the selection of a precipitant, and is quite as important as the other factor, which is the size precipitating power of the precipitant. The size precipitating power has been found to be practically in direct proportion to the acid concentration.

Other Considerations.

Certain other considerations demand some attention in the selection of a precipitant. Among these may be mentioned the character of the water in the beater, with respect to its alkaline or acid reaction, after the size has been precipitated. In most cases the "back-water" must be somewhat acid in order to insure proper fixation of colors on the fibers and proper running on the paper machine. In certain other cases, e. g., when viscose is also added to the beater for sizing and strengthening, the water should be neutral, or nearly so; in fact, preferably of extremely slight alkalinity.

In addition to the above, it is desirable to take into consideration any effect on the color and strength of the paper which the precipitant may exert. If ferrous suphate did not exert a bad influence in these respects there would not be serious objection to its use as a precipitant. However, in case unbleached sulphite pulp is sized by the use of this precipitant, the iron unites with the residual lignicellulose in the pulp and darkens it considerably. If bleached pulp is so treated the iron reacts in a measure with the rosin, causing another type of discoloration. Furthermore, the strength of the sheet of paper is impaired due to alternate oxidation and reduction of the iron by atmospheric influences, resulting in the destruction of the celluose by the formation of oxycellulose, which is much weaker physically. The same applies to unbleached pulp. In the lowest grade papers this iron sulphate (copperas) may be used in place of alum.

Alum Unexcelled as Size Precipitant.

As a size precipitant alum is unexcelled, everything being taken into consideration. It produces the bulkiest precipitate of all the precipitants to be considered because of the affinity of the basic aluminum compounds for water, and their ability to form highly colloidal and gelatinous precipitates by the absorption of water. In size precipitating power, it is good. It contains in commercial form approximately 40 per cent sulphuric acid anhydride. In practice, however, considerable excess of alum over the theoretical amount is used, as the precipitation is effected more quickly and more completely.

One of the Best Procedures.

As a substitute for alum one of the best procedures is the use of niter cake or sodium bisulphate to replace half of the alum. For every ten pounds alum used ordinarily, use five, and add two pounds of niter cake to make up for the five pound deficit. This procedure most nearly duplicates the results obtained by alum alone, and is to be preferred to any of the following substitution methods, provided, of course, half the original suppy of alum is available.

Nitre cake may be used aone as a substitute for alum, but will not produce nearly so bulky a precipitate, and as a result in order to size the paper to the same desired sizing strength it may be found necessary to increase the amount of size per ton. The quantity of nitre cake necessary to be used is variable, being dependent upon its variabe content of sulphuric acid. Generally one-half the usual weight of alum used will be found sufficient in the case of niter cake. Niter cake, in this case, functions in essentially the same manner as sulphuric acid would function. It is a cheap source of sulphuric acid.

Sulphuric Acid May Be Used.

Sulphuric acid may be used as a size precipitant, but does not produce so bulky precipitate as niter cake. Half as much sulphuric acid as niter cake will be found sufficient.

In the above connections, it must not be forgotten that in some mills, depending upon the character of the pulp, it is impossible to get so hard sized paper as with alum by the application of the above methods. In such cases there is little doubt that the basic aluminum resinate assists considerably in obtaining the desired effect.

Ferrous sulphate is found suitable, provided the defects in color and strength of the paper are unimportant as above noted. The precipitate is more bulky than with fiber cake alone, or sulphuric acid is used. For instance, in a black or gray packing or lining paper, this may be used very satisfactorily. In fact, it has been used by some manufacturers.

Magnesium sulphate and zinc sulphate may also be used. They form bulky precipitates, have a slightly lower size precipitating power than alum, and unlike all formerly mentioned precipitants, they have a neutral "back water" in the beater. This renders them

*Read at the Fall convention of the Technical Association of the Pulp and Paper Industry, Saratoga Springs, N.Y., Sept., 1920.

specially useful when viscose is added to the beater. In fact, under these conditions they must be substituted for alum. However, when used in the more usual methods of paper manufacture, some form of acidity should be added in the required amount, so as to have the back water acid, the advantages gained being explained in the fourth paragraph of this paper. As a source of acidity we may preferably add niter cake solution or sulphuric acid in the required quantity to make the water faintly acid. Avoid a great excess. The water need not be so acid as is often the case when sizing.

Certain other soluble sulphates could be used, but the prices are prohibitive. The chlorides of the above metals could be used, and hydrochloric acid. All the compounds mentioned as precipitants are approximately the same price or cheaper than alum, taking into consideration the amount which must be used.

It should also be noted that whenver adding any size precipitant greater economy is always experienced by adding it in solution.

WOOD PULP PRODUCTION IN CHILE.

Persons familiar with Chile's timber resources consider this an opportune time to invite the attention of American capitalists to the possibility of developing a wood pulp industry in the southern part of the country, where the islands and mainland are thickly forested. Heretofore it was thought that the remoteness of these timber supplies would make their exploitation unprofitable until such time as more accessible wood pulp material ceased to be available. Under the present conditions, it is believed that the time is at hand to study the Chilean woods and their possible utilization according to modern methods, U. S. Commercial Attache Charles A. McQueen at Santiago reports.

An investigation of Chilean timber was made in 1915 by a special agent of the Bureau of Foreign and Domestic Commerce, whose report is contained in Special Agents Series No. 117, Lumber Markets of the west and north coast of South America. This pamplet may be purchased for 25 cents from the Superintendent for Documents, Government Printing Office, Washington, D.C., or from the district and co-operative offices of the Bureau of Foreign and Domestic Commerce. Later the Madison (Wis.) Forest Products Laboratory of the United States Department of Agriculture made tests of several varieties of woods and cane for the Chilean Government to ascertain their qualities as pulping material. The following samples were selected for the tests: Oliville, laurel, coigue, lingue, roble, and quila,

As published unofficially, the following results were given on application of the chemical soda method: The olivillo produced 38 per cent of pulp with fibres that averaged 2.15 millimters (1 millimeter = 0.039 inch) in length. The pulp was dark in color and 40 per cent of whitewash was needed. If the caustic solution were strengthened, the pulp could be more easily whitened, but the production would be materially decreased. This wood is especially adapted to the manufacture of wrapping paper in its natural color on account of its long fibres. Paper made from this wood averaged 43 pounds per ream of sheets 24 by 36 inches, and showed a strength of 23 pounds per square inch for paper 0.0044 inch in thickness, using the Mullen test.

Laurel contained fibres which were too short and uneven for good results, and did not compare with the other samples submitted.

The coigue produced 42 per cent of pulp and only required 19 per cent of whitewash. The fibres were short, averaging only 0.86 millimeter in length, but the pulp was heavy. Paper for books and other uses could easily be manufactured, provided sulphite of soda were added to the pulp.

Lingue, although appearing to be hard, was easily dissolved. The pulp was similar to that obtained from the coigue, but the fibres, which averaged 1.11 millimeters, were longer, and the pulp obtained had a greater resistance. From these tests it is believed that both coigue and lingue could be reduced to pulp in the same solution, as they require about an equal amount of whitewash.

The roble was easily converted into pulp, which was dark in color, and therefore not recommended for the manufacture of paper.

The quilla is a reed or cane which can be harvested annually and is found in large quantities. Of all the samples submitted for test, it was found to be the best suited to paper manufacture. Three tests of one, one and a half, and three hours were made, all of which were satisfactory. The pulp produced in the shortest time was the most satisfactory, however, as it was clearer and more easily whitewashed. In this test the pulp was pink in color ,and the fibres averaged 2.22 millimeters in length, with a maximum of 2.66 and a minimum of 1.34 millimeters. A whitewash of 35 per cent was necessary, chloride of lime being used as a base. The original cost of production would be low, and the pulp is fibrous enough to make the addition of a sulphite pulp unnecessary. The product was found to be particularly suited to the manufacture of news print without whitewash, or to the manufacture of light book and similar paper if properly whitewashed. The manufactured paper could also be reduced to pulp and used again after being cleaned.

In addition, there are other woods which are said to be equally or better suited to the making of pulp. Among them are the Araucanian pine, which grows on the Cordillera, and is more readily accessible from the Argentine side, and the canelo, a plentiful and rapidly growing tree, which is a good pulper, but dark in color. Tests made of the Araucanian pine are said to have given satisfactory results. The fibres averaged 2.36 millimeters in length and 0.036 millimeter in thickness. A 10 per cent solution of hydrate of soda was used, the proportions being 26 parts of wood to 100 parts of solution. For the whitewashing process 28½ per cent of a 33 1/3 solution of calcium chloride.

The natural location for operation would be the region south of Puerto Montt, the southern terminus of the Central Railway. Between the island of Chiloe and the mainland is a sound which has many well-protected small harbors, permitting the entrance of vessels up to 3,000 or 4,000 tons.

We would recommend dark glasses (goggles) for the city workers since the style for ladies has changed, but we are afraid it would be the same old cry as the saw filers put up—they can't see well with them on.

"Careless habits", says the Safety League, "are like porous plasters—easy to acquire and hard to shake off."

Technical Section Meeting

(Continuation of the Proceedings of the Annual Meeting of the Technical Section of the Canadian Pulp and Paper Association, January 19 and 20, 1921.)

Following the discussion of Reports of Committees as published last week, the Chairman asked if there was any new business to be brought before the meeting.

Revision of membership Qualifications.

Mr. CROSSLEY: Mr. Chairman, there is one thing that I should think should be brought before the meeting of the Technical Section today. That is a question of some change in the Constitution changing the status required for membership.

I would like to cite a little illustration. Not very long ago, as a member of the Educational Committee, accompanied by another member of the Committee, it was our privilege to listen to a discussion of a manuscript on the Paper Machine, by a half dozen paper mill superintendents. We enjoyed the discussion very much, and I asked these gentlemen why it was, when we had a Technical Section meeting we did not have something on the same form of discussion on papers, and the reply was that our meetings were becoming rather too highly technical; that it was difficult to follow some of the discussion because of the language sometimes used.

Now, it seems to me that the Technical Section has, as one of its greatest objects, the advice and counsel of the men who are "Fathers" in industry—men whose voices should be heard in our discussions, and men who perhaps are more able to give us information of a practical nature bearing on the operation of the machinery in mills than I would be able to get from a discussion of a more or less abstruse nature, I think, therefore, that some steps should be taken to modify the requirements for membership in order that there shall be no excuse for the non-membership of the men whose information and experience is perhaps more valuable than any other class of men in the industry, and I take the liberty of putting the motion without commenting upon it any further.

Mr. CARRUTHERS: Mr. Chairman, I believe it is pretty well understood by the majority of the members of the Technical Section that there are many superintendents and practical men who are worthy to be regarded as full members of this organization.

The matter has been discussed informally by the officers of the Section, as you no doubt are aware, and I would be very glad to make this a motion, but I am not sufficiently familiar with the procedure, as to whether a motion is in order or whether a notice of motion should be given, but if it is acceptable as a motion I will be glad to offer it, or if not acceptable, to offer it as a notice of motion, that the third paragraph of our application form for membership in the Technical Section, which says:

> "A member shall be twenty-eight years of age or over, and shall have a technical education of at least the equivalent to the Bachelor of Science decree, etc."

shall be changed so as to read:

> "A member shall be twenty-eight years of age or over, and shall have a technical education of at least the equivalent to a Bachelor of Science decree, or practical experience that, in the opinion of the counsel, shall entitle him to full membership."

I would be glad to make that as a motion, if there are no objections.

If this is acceptable it will do away with the feeling which so many of the practical men have that they do not wish to be admitted into this branch of the organization as Associates; they want to be admitted as full members.

THE CHAIRMAN: Mr. Carruthers and gentlemen: In our bylaws, the Secretary has pointed out to me Article 8 of the Constitution, which says that "Any article in the constitution may be amended by the members present at any regular meeting of the Association by a two-thirds vote of the members present, provided that such an amendment shall be presented to the members in a printed or written notice at least thirty days before such meeting."

"This article may be suspended by an unanimous vote of the members present."

Mr. McInnis: I am not going to make any suggestions, but will just speak to the motion for a moment. I will merely make my statement.

As most of you are aware I am somewhat interested in this question of the practical man and the technical man.

You are doubtless aware there has recently been formed in the United States an organization that I think is of the utmost importance to this industry, known as the "Superintendents' Association."

Now, there was a meeting held at Niagara Falls the first part of this month for the purpose of forming the Canadian Section of the Superintendents' Association, and I understand that meeting was very well attended. At that meeting papers were read and discussed on matters that are of immediate importance to the Superintendents, and also the managers and technical men in this industry. In other words, the problems that came up there were the ones the men were most interested in.

Now, at that meeting, I am informed, it was decided by the Executive Committee to invite the Technical Section to their next meeting.

I think that is mighty good move. I think the practical man needs the technical man just as much as the technical man needs the practical man, and if such an invitation comes forth, I think it would be a mighty good idea for some of the technical men to accept it, seeing that there is such an organization in existence. I also do not see why they should not be invited from time to time at these meetings, and it should be done with the thought that there ought to be some combination between the practical and technical men.

THE CHAIRMAN: Before we can speak to the motion, we will have to have a motion made and seconded and adopted by all the members for the waiving of the provisions of Article 8.

What we are attempting to do — this whole question is looking towards the bringing together of the so called practical man and the technical man. So far, the practical men have not seen fit to join in with the Technical Section to any great extent, and we have, by our by-laws, in a way, ruled him out from active participation in our meetings.

The question, to my mind, is, "Is it a wise move for us to change our by-laws so that he will come in, at first, gradually, but afterwards in full strength?"

I have given this thing a great deal of thought. I would like the fullest co-operation between these two sets of men, and, as Mr. Carruthers has said, your Executive Council has informally discussed it several times very recently; in fact, several proposals have been made.

We have in the States a new Association growing up by leaps and bounds. "The Superintendents' Association" which Mr. McInnis has just mentioned. This Association has invaded Canada recently at Niagara Falls. It is rapidly getting a membership from the Canadian Superintendents and practical men. Shall we stand back and allow all of our Canadian operators to be absorbed in into an Association across the line? Or shall we attempt to help the members in forming a similar Association in this country—on this side of the line, which, after a period of years, shall have attained a strength of its own, which will allow it then to co-operate with the Association on the other side, the same as the Technical Section and the Technical Association now co-operate, and then through contact one with the other, the Technical Section and the Superintendents Association, we shall gradually become better and closer friends, better co-operators, and finally, after a period of years,—some five, or six or seven years, united in one strong Canadian section of the Canadian Pulp and Paper Association.

To my mind that is the logical way for its development to take place. If we provide for full membership in our Technical Section for the practical men, the superintendents, the department heads, and so forth, will they then respond in proper numbers and in proper spirit? Since we are already established as a Technical Section, will not the tendency be to have discussions more or less of a technical nature, too technical for the practical man to get the benefits which he should get? Should not the practical men be bound together, first, to grow into a common industry or organization, which can then expend with ourselves gradually, a gradual evolution through a period of years, one co-operating with and teaching the other?

That is my feeling in the matter. It is merely personal to myself, and one suggested at a recent meeting of the Executive Council.

Mr. WILSON: I would like to make a remark on the expression which I have heard uttered here, where there is a distinction between the practical and the technical men. To my mind no man is really a technical man unless he is a practical man, and at the same time, the more or less practical men in the industry have all got to deal with technical problems. So these practical men are all more or less technical men too. I think the tendency is more and more to have superintendents who have technical education At least, if they don't have a start with a technical education, they gradually acquire more or less of a technical education.

Also, in this Superintendents' Association there are a great many men who are technical men, who have the technical education, and, therefore, I do not think these are two different problems.

In our industry there are a great many men who have not the technical education, and yet not entirely solely practical men, and I think it will be of great benefit for this Association — for the Technical Section — to have these practical men in here; it is their problems which we are discussing here. If they are part of the industry, they have to be looked upon from a practical point of view.

THE CHAIRMAN: Gentlemen, there are two points here which, I think, should be touched upon. I had a discussion at breakfast this morning about this very unfortunate term, the words "practical men" and "technical men". To my mind, the word "practical" is unfortunate because it seems to reflect on the technical man. The practical man can be just as technical as the technical man himself, and vice versa. The word is used and accepted, and probably never will be gotten away from, however, and we must recognize that the proper meaning of it is somewhat as follows:—The "practical man" as we generally understand it, is the man who has no technical education, and who is in direct charge of operations. The "technical man" is the man who has the technical education, and he may or may not be in charge of mill operations. That is the way we look at it.

Now, the second point we are taking up, is how we can get the practical man more interested in the Technical Section. The question is shall we bar him out through our by-laws, or shall we not. That is not the question. It is, how shall we best get together, through a change in the by-laws or some other way? We all are agreed that the practical man and the technical man should be together in an Association. Now, can that best be accomplished by changing our by-laws, so he will be allowed to come in, or best accomplished by letting him form an Association of his own, which shall ultimately be joined with ours? It is not a question of barring him out. I believe in the proposal spoken of a few minutes ago, we have the best way. That is my personal opinion. It seems to me that we should not bar him out through our by-laws, but at the same time, he should form his own association, and be free to come into ours, but before we can do anything, we must have a motion made and accepted to waive the by-law, and I would call for such a motion before we have any further discussion.

Mr. STADLER: Mr. Chairman and gentlemen: I would, before making that motion to waive the by-laws, express my views. I think they have been expressed sufficiently, but I would emphasize what my personal opinion would be. If, at the present time some people feel that they have not received due consideration in the Technical Section, on account of the wording of the by-laws, my present view would be, by all means to modify the by-laws, and in order to accomplish that, I would move, for the present time, to waive the by-laws.

Mr. BRYANT: I second the motion.

(Carried unanimously.)

Mr. CARRUTHERS: I would move that Article 8 read as follows:—

> "A member shall be 28 years of age or over, and shall have a technical education, of at least the equivalent to a Bachelor of Science decrees, OR PRACTICAL EXPERIENCE THAT, IN THE OPINION OF THE COUNCIL, SHALL ENTITLE HIM TO FULL MEMBERSHIP."

I might say, in connection with this motion, that there is no doubt in my mind that the majority of us have not given sufficient attention to these practical men, and I think we ought to turn over our summer meeting — have two meetings a year — into the hands

of these men, and the problems with which they have to deal directly. We must limber up this organization so as to make it more sympathetic. Of course, the question of whether they join another Association or not; that is their business. We can all co-operate with any of our American friends, and I believe we should.

Mr. STEPHENSON: I have pleasure in seconding this motion.



GEORGE CARRUTHERS, Elected Chairman Technical Section

The new opening for these men to get in with us, is, I think, a mighty fine proposition, because, with the new proposal for research work, we are going to need more and more the co-operation of these men, and it is going to be much easier for us to get it, if they are in the family.

Election of Officers.

THE SECRETARY: The nominating committee submits the following names for officers of the Technical Section for the ensuing year.

For Chairman and Vice-Chairman: George Carruthers, Interlake Tissue Mills, Ltd.; R. W. Hovey, Abitibi Power and Paper Company; O. F. Bryant, Laurentide Company, Limited.



O. F. BRYANT. Elected Vice-Chairman Technical Section.

For members of the Council: Messrs. Doctor John S. Bates, Maurice Neilson, Cone Barlow, E. B. Wardle, P. J. Murer, and K. G. Wilen.

Submitted by Committee on Nominations: Messrs. John Stadler, F. A. Sabbaton and J. N. Stephenson.

You will note that it is necessary for the members to check two names under the heading, "Chairman and Vice-Chairman", so the two receiving the most votes and the next largest number, will be the Chairman and vice-chairman respectfully for the coming year. Under the list of names for the Council, three names are to be checked.

THE CHAIRMAN: I would like to point out that the names as submitted were selected by your regularly appointed Nominating Committee, but their selection does not necessarily mean that other nominations are barred out. Any names which you, as individuals, see fit to make are in order. If there are other men whom you desire to have as your officers for the coming year, you are at liberty to vote for them.

I will appoint as Tellers to gather your votes, Mr. Stephenson and Brawn. You may prepare your ballots immediately, and Mr. Brawn and Mr. Stephenson will scrutinize them.

After the ballots were counted the result was reported as follows:

The election, therefore, stands, for Chairman, George Carruthers.

Vice Chairman, O. F. Bryant.

For councillors: Dr. John S. Bates, Mr. E. B. Wardle and Mr. P. J. Murer.

HOWARD SMITH'S RECORD YEAR.

The annual statement of the Howard Smith Paper Mills, Limited, for twelve months ended December 31, last, discloses earnings of the enterprise at a record level, net profits for the year being $1,089,898. This compares with $704, 261 in the 1919 period, the latter figure representing the earnings of the Howard Smith Paper Manufacturing Co for the full twelve months, so that the 1920 increase amounted to $385,657.

After deducting bond interest and preferred stock dividends, which totalled considerably higher than in 1919, owing to the capital reorganization of the company and the acquisition of the Toronto Paper enterprise, there remained a balance of $891,898 applicable to the increased common stock outstanding, or equivalent to 30 per cent on the average of the year.

Concurrently with the mailing of the annual financial statement and the directors' report for the year, a circular announcing new financing on the part of the company is going forward to shareholders. For the approval of the latter will be submitted at a special meeting to be held on March 1 next, a by-law adopted by the directors cerating an issue of $7,000,000 seven per cent., 25-year, first refunding mortgage sinking fund bonds. Of this amount it is proposed to issue $1,000,000 at once, the proceeds of which will be utilized to provide additional working capital and means for further extensions.

Don't simply see how you can "put in the day." See how much you can put into the day.—B. C.

R. A. Mc INNIES LEADS ASSOCIATED BOARDS OF TRADE.

That the men of Northern Ontario have every confidence in the possibilities of their country was evident in the inspiring addresses made at the Banquet of the Associated Boards of Trade of Temiskaming held in Cobalt, on Tuesday, 15th February, under the chairmanship of the President Mr. R. A. McInnis, General Manager of the Abitibi Pulp and Paper Co.

Many important facts were emphasized in the course of the speechmaking, not the least being that there is no collision of industry with another, but that all are vital to the north of the Dominion as a whole. A close observer of the proceedings of the meeting of the Associated Boards of Trade would find ample proof of the very real desire for helpful co-operation that exists among the various towns of the north country and their determination that their actions shall be for the benefit of the whole rather than the individual.

Mr. McInnis is a successful manager, unassuming but unafraid, and with an experience of "big business" that will enable him to serve the interests of the North in a manner calculated to add materially to the influence of the Association.

During the course of the evening, speeches were made by Mr. A. T. Brigham, Manager of the Hollinger Mine, who scored to proposed increase in the profits tax as it affects the mining industry. He was followed by Mr. A. L. Dawe, Secretary of the Canadian Pulp and Paper Association, who spoke on the importance of the paper industry in the development of the resources of Ontario and instanced the various mills. He stated that the Abitibi mill at Iroquois Falls was making 70,000 tons of paper every year, and this output will soon be doubled. Every ton consumes a cord and a half of wood. The development of the industry in recent years could be traced to the "wise enactment" of the province of Ontario prohibiting the export of pulpwood from Crown lands. He said the industry felt assured of supplies for many years to come and termed paper the "sinews of civilization." The revenue from Ontario's forest reserves was $1,850,000, or 12 per cent of the total income of the province, last year.

What timber was cut was nothing compared to what was destroyed by fire and disease, said the speaker, who considered reforestation was a task for the Government. He touched on the Swedish system of replacing trees and said the time had come to formulate some such system in Canada.

Mr. Dawe said that 200,000 cords of wood were being sent out of Ontario every year, cut from freehold limits, enough to keep two plants of the size of Iroquois Falls in operation. He declared that inasmuch as these exports are denuding the country of raw materials vital to a "key" industry, an export tax should be imposed, the proceeds of which should be utilized by the Provincial Government in a safe and sane policy of forest protection and reproduction.

Mr. Robson Black, of the Canadian Foresters Association, declared that the forest was the great balance wheel of all constructive activity in Canada. He said that 200 spruce trees went to the making of one issue of the Globe, and that forty million newspapers were issued in the United States and Canada every day. Mr. Black told of steps taken in France, Sweden and Germany to keep this industry permanent, and said that while in the last decade Canada had cut her stock in two, in Germany the resources had been doubled while more timber was taken out than over here.

The speaker said in the habitable portions of Canada eight areas out of every ten were unfit for agriculture, and he declared the conservationist proposed to use the non-farming land for growing trees. There was no collision between the forest and the farm. The forest asks only the land the farm cannot use. Since Confederation a million square miles had been burned up, while only a hundred thousand had been cut by the axe of the logger. Some idea of the trail of the forest fire fiend might be gained when it was remembered that in British Columbia 22 times as much timber fell before fire than before the axe, that in the prairie provinces from one-half to two-thirds of the forests were gone, that Ontario had lost at least half and that Nova Scotia was practically bankrupt in this respect.

It would seem unnecessary to argue for forest fire protection before a gathering in northern Ontario, but such is the perversity of human nature that the experiences of Matheson, Cochrane and other fire smitten areas, that the lessons of those catastrophies have been largely forgotten and painfully little real progress has been made.

The business session of the Association occupied Monday, Tuesday and Wednesday, the agenda sheet containing many important questions for the decision of the delegates. Opposition on the part of the representatives of Cochrane developed at the outset of the meeting, arising from a misconception of action taken by their President Mr. R. A. McInnis in regard to the proposed extension of the T. N. and O. Ry. to James Bay. The President had no difficulty in persuading the meeting to his point of view and the objections of Cochrane were withdrawn.

Mr. McInnis also took the opportunity of impressing on the gathering the necessity of investing the executive council wiht the authority to act on behalf of the Associated Boards of Trade in all cases where immediate action of a joint nature is needed.

Subsequently the meeting confirmed its confidence in this policy by rejecting a motion to ask for a commission to report on the needs of the North and requesting the Executive Council to undertake this work.

TECHNICAL SECTION.

NEW MEMBERS.

Among the new members of the Technical Section are: G. M. Fowler, Dryden Pulp & Paper Co., Dryden, Ont., A. T. Davis, Riordon Co., Hawkesbury, Ont., and A. G. McIntyre, Clark Bros., Bear River, N.S.

Mr. G. W. Dickson has gone to Fort William, Ont. to take charge of the mechanical pulp department of the Fort William Pulp and Paper Co. He had charge of this department at the Laurentide Company before taking his latest position as safety engineer for the Riordon Company.

News From Europe

Experiences in Soviet Russia.

Herr Petersen, an Esthonian citizen, who for five years has been manager of a paper mill at Samara, describes his Russian experiences in the Finnish Paper and Timber Products Journal. The Bolshevist regime began in 1918; the mill of the Bumaga Company in Samara was requisitioned and "nationalized", whereby the "free" sale of paper was stopped. It is perhaps superfluous to relate that Herr Petersen's freedom was stopped likewise, and from 1919 to 1920 he was forced to undergo compulsory labor, that is, clerical work in the office of his former company. Besides confiscating private property, the Bolsheviki butchered many of the owners and sacked their houses. From this situation Herr Petersen was rescued by the peace between Russia and Esthonia. Here are some of the prices at Samara: Butter, 3,500 roubles per lb.; Milk, 1,500 roubles per quart; Beets, 2,000 roubles per poud (about 39 lb.); Potatoes, 6,000 roubles per poud; Sauerkraut, 200 roubles per lb.; Pork, 1,500 roubles per lb.; Fat, 3,000 roubles per lb.; Wheat flour, 17-18,000 roubles per lb.

Owing to the shortage of coal a railway journey from Moscow to Samara, or from Samara to Ufa took three weeks. The trains had to stop for fuel, frequently for days. In Samara, for the same reason, water and electric power were in operation only between one o'clock and midnight.—Finsk Pappers—Travaru—Och Industritidskrift, January 15, 121.

The Paper Markets in France.

Exactly what La Papeterie means in the following announcement must be left to the imagination. "In our number of December 25, 1920, we wrote in our article on the position of the paper market: 'As for certain other countries with a depreciated exchange newcomers in political life and of a commercial mentality *still a little uncertain in its gait,* some experiences, rather unhappy for us, do not permit us to count upon a regular supply from this quarter'. This phrase, as one of our readers has justly remarked, might seem to include, among the countries in question,—one whose commercial mentality, notably in all that concerns trade in pulps, has been above criticism. The makers of Finnish cellulose, as we know, have formed a powerful Association, the Union of Finnish Cellulose Manufacturers which concentrates in its hands all sales of chemical pulp. Two similar associations exists, one for mechanical pulp, the other for paper.

We are bound to say, to the honor of Finnish manufacturers of cellulose, that they have always made deliveries with scrupulous regard to the terms of their contracts, whatever might be the conditions since those contracts were passed, such as the situation, course of prices and exchange at the moment of delivery, and despite the reasons for breaking them which might be invoked. Certainly the pill was sometimes bitter! We will not mention prices which are liable to excite the regrets of French paper makers who, at the same time, were compelled to buy pulp at figures indeed—American.

We learn, at the moment of going to press, that the coefficient of duty increases on newsprint and book paper is about to be abolished. On the other hand a programme is being evolved to prevent closing down of the paper mills and to exploit the resources in raw materials offered by France and its colonies.—La Papeterie, January 25, 1921.

The Timber Industry of Soviet Russia.

What has become of the immense timber resources of Russia under the Soviet regime? According to a French contemporary the question is not without interest, for it is evident that the unhappy state of that country must react unfavorably on the world at large. Unfortunately information as to this matter is vague and unsatisfactory. It is certainly probable that the timber industry of Russia is far less prosperous that the Bolshevik statements, designed for Western consumption, would appear to prove. Under normal conditions, consumption of timber is enormous throughout the country from Archangel to Ekaterinburg. It is known that the Soviet institutions are unable to supply the demands of the railways alone, which require 18 million sleepers, of which only 2,700,000 have been supplied. The sawmills of the Petrograd region are receiving but a tenth part of corded wood which in normal times they procured without difficulty. This district, according to the "Economischeskala Jizn", a Communist organ, has a "capacity of absorption" of 44 million cubic feet; its stocks are now 1,500,000 cubic feet. Apparently the requirements of the Moscow region are figured at 88 million cubic feet, but the quantity which can be transported is not more than 9 million. The proportion in other parts of Russia of the timber needed to what is delivered is never above one-tenth. In the meantime the Bolsheviks have tried forced labor, but inasmuch as this system failed to produce the anticipated results, they have organized a forestry department with skilled workers. But the condition of virtual slavery of these men, together with underfeeding, has eaten grievously into their productive power. Such are the disastrous consequences of Bolshevism.—Le Bois, January 27, 1921.

The American Splendor — A Spanish View.

A writer in "Ergos", the Spanish journal of the paper trade, predicts that the United States are now entering upon an era of industrial strife akin to that in the Old World. "For a long time", he, says, "we have had it dinned into our ears that the development of Yankee wealth and power is prodigious. The facts are patent. Nature has lavished on American citizens energy, respect for law, liberty, fertility of invention, and business "cheek" ("la audacia economica" in the polite original). But we shall not be deceived if we anticipate the economic struggle, from which arise both the prosperity and ruin of nations. Thus in ten years the cost of living in the United States has risen 60 per cent. The cause is the initial strife of all society. On the one hand there are those who sell "commodities"; on the other those who sell labor. Both fight to obtain the largest share in the fruit of this effort. When labor triumphs commodities are cheap and wages are high; the nation prospers. When the sellers of commodities begin to triumph the cost of living increases, and labor becomes cheaper".—Ergos, November 1, 1920. (The writer should study New York, where the wanton disregard of law makes the judicious grieve. As for wages, in the paper industry, at least, their rise seems to increase the cost of everything else).

TECHNICAL ASSOCIATION PREPARES FOR ANNUAL MEETING.

The Executive Committee of the Technical Association of the Pulp and Paper Industry met in New York last week and completed preliminary arrangements for the annual meeting and banquet of the association, which is to be held in conjunction with the annual meeting of the American Paper and Pulp Association at the Waldorf-Astoria and the Hotel Astor, New York, during the week of April 11 to 15, 1921.

The convention will open with informal meetings of the Executive Committee and the chairman of standing committees on Monday, April 11, while the first general session of the association will convene in one of the large meeting rooms of the Waldorf-Astoria at 10.00 o'clock A.M., Tuesday, April 12. There will be the usual welcoming address, followed by the address of the president, reports of standing committees and nominations for officers to serve during the ensuing year. The second general session in the afternoon will be devoted to the reading and discussion of scientific papers.

On the evening of Tuesday, April 12, at the Hotel Astor the annual banquet will be given at which Judge Charles F. Moore will be toastmaster. An attendance of between four and five hundred is looked for at the banquet. Seats at tables will be assigned to suit the wishes of members, who have the privilege of inviting guests. Reservation blanks will be mailed to members with the formal notice of meeting and the secretary hopes that applications for table reservations will be made promptly on receipt of the application forms. Reservations for the banquet of the main association can also be made by members of T.A.P.P.I., who are all eligible to attend.

The third general session of the annual convention of T.A.P.P.I. on Wednesday will feature symposiums on Pulverised Fuel and Steam Economy, conducted by Howard S. Taylor, chairman of the Committee on Heat, Light and Power; and new methods of grinding wood, conducted by the Committee on Groundwood, of which W. E. Munro is chairman. Other symposiums, discussions and special papers for Wednesday and Thursday afternoon will be announced later.

Thursday morning will be reserved for the annual meeting of the American Paper and Pulp Association which will be attended by the Technical Association in a body.

A new volume of "Technical Association Papers" was published last week and mailed to members from the secretary's office. It contains a revised and enlarged paper on tests for unbleached sulphite and sulphate fibers, in addition to the special papers and addresses presented before the Technical Association at the Fall meeting in Saratoga Springs, N. Y., last September. The working principle of the mercury-vapor boiler invented by William Leroy Emmet, of the General Electric Company, is described in the new volume in concise and comprehensive terms, an outline sketch of the apparatus being included. The volume contains a list of the officers and committees of T.A.P.P.I. as well as a directory of members and the text of the constitution and by-laws. Copies of the volume are on sale to non-members at the Secretary's Office, 542 Fifth Avenue, New York, at $2 each.

The next series of "Technical Association Papers," to be published in May or June, will contain a limited number of advertising pages, it having developed that several of the larger manufacturers of machinery and apparatus desire to make announcements through the official journal of the association. The advertising is to be restricted to descriptions of technical apparatus, machinery, and materials used in pulp and paper mills that are calculated to be of interest and value to technical men in the industry. The Executive Committee has ruled that manufacturers of paper be not permitted to contract for advertising space in the association's journal.

The next Fall meeting of the Technical Association will be held at Washington and Philadelphia. An invitation of the American Pulp and Paper Mill Superintendents' Association for a joint meeting with the Technical Association has been accepted, providing the meeting can be held in the latter part of September in conjunction with the regular Fall meeting of the Technical Association. The superintendents' association had expressed a desire to hold the joint meeting in the month of June but there would be difficulty in getting the members of T.A.P.P.I. together within so short a period after the annual meeting in April.

T.A.P.P.I. was well represented at the annual meeting of the Technical Section of the Canadian Pulp and Paper Association to be held in Montreal on Wednesday and Thursday, January 19 to 20, as ten of the twelve delegates appointed were in attendance. The names of the delegates follow: R. B. Wolf, R. S. Kellogg, George E. Williamson, W. E. Byron Baker, Grellet N. Collins, J. A. DeCew, Clark C. Heritage, Kenneth T. King, W. A. Munro, Howard S. Taylor, Ross Campbell, Arthur S. Cosler.

Among recent elections to membership in the Technical Association is that of Dr. Jessie E. Minor, at present head of the pulp and paper department of the Emerson Laboratory, Springfield, Mass. Miss Minor's application received the unanimous approval of the Executive Committee early in January and she has taken her place as an active member with Miss Helen U. Keily, associate chemist of the American Writing Paper Company, these being the only two lady members of the association. Miss Minor holds the Doctor of Philosophy degree in chemistry from Bryn Mawr College and is a B. S. of Drury College.

The Technical Association of the Pulp and Paper Industry is now working in splendid harmony with the American Paper and Pulp Association and sister associations. At the meeting of the Executive Committee last week a series of organization charts was exhibited showing the relations of the affiliated associations to the American Paper and Pulp Association and a resolution was adopted pledging the hearty support of the Technical Association to Dr. Hugh P. Baker in his work as secretary of the American Paper and Pulp Association. The association is also cooperating with the Cost Association of the Paper Industry in the production of short, pithy accounts of manufacturing processes involved in the production of typical papers, beginning with the raw materials used and processes and machinery. This is to be done in connection with the decimal classification of papers and boards originating in the Department of Technical Control of the American Writing Paper Company in which ten types of paper and boards are subdivided into seventy-two classes which may be still further divided into one hundred and fifty-six known kinds of paper. An article will be published at an early date showing the possible use of such a classification scheme by manufacturers.

British Trade News

(From our London Correspondent.)

London, 9th February 1921.

I learn that the Paper-Makers Association of Great Britain and Ireland will meet for their annual congress on March 4th in London. It is usually a function round the festive board and it is hoped the President, Mr. Leonard Tod, will preside. As there are many subjects of national interest to be faced by the Association there should be a good attendance.

The Government's Dictionary.

It seems remarkable, but, yet it is true, the Government are preparing a dictionary on paper manufacture. It is somewhat difficult to get any information about it, but I am told on good authority that it will only deal with the different skilled and unskilled positions embraced within the industry and when finished the work will not be made public. Positions like a super-calenderman or a sale clerk have upset Government "knowledge" and now the A. B. C. dictionary is to be introduced for guidance. What surprises one most of all is, how did the Government intervene in labor disputes, when they did not know the actual occupations of the paper industry?

The Pulp Men's Dictionary.

I may assume that if a dictionary is being prepared for the paper industry, the pulpmen will want a section in also. Their statistics are at times very misleading and the pulp importers decided at their annual meeting recently held to approach the proper Government authorities with a view to remedying the present state of things. What is wanted is a proper return of the imports into the United Kingdom during the year and the exact sources from whence the pulp comes. In other words the Government must get out a dictionary of pulps, issue it to the Customs, and give sellers and buyers alike — under its own proper heading — the class and quantity of pulp arriving at the ports. Some people blame the shipping agents, some the importers or agents, but there is one thing certain the Customs issue their return of what comes into the ports and if that return is wrong they are alone to blame.

Paper Statistics.

While on the question of statistics — this is a statistical period — it is interesting to note the alterations made in the returns of paper each month on import and export account in the United Kingdom. There has been what is known as a reclassification on the part of the Government, or, as a commonsense businessman would say, a "complete muddle". This re-shuffle has peculiar elements, and it is extremely hard to get properly classified returns for the information of Canadians. I would suggest now that the Canadian P. & P. A. take up this matter with their own authorities in London and get accurate data and quantities of such items as newsprint, as separate from fine printings, and so on in the classes of papers in which Dominion producers are interested. Before the war there was some attempt at classification, but events since then have evidently changed official tactics.

Wood Pulp Association.

Mr. L. P. Andrews, whose character sketch appeared some months ago in the Pulp and Paper Magazine, has been re-elected President of the British Wood Pulp Association, of which he is one of the original members. Mr. T. T. McCrow supported the resolution of Mr. W. J. Mather that the vice-presidents be re-elected and this was agreed to. Young Mr. Erie Nordberg is still acting as Secretary and Mr. L. P. Andrew's right-hand man and the auditors are Mr. Wm. Greenhalgh and Mr. G. W. Andrews.

There was nothing very interesting to record at the meeting, except a little feeling of despondency. Every man had a doleful tale to relate — and even the ubiquitous contract note was not overlooked. However, times are hard now with pulp men in England and until the new demands of the papermakers made upon them they cannot look too cheerful. But every cloud has a silver lining. The President said a few words about the depression and difficulties they had had to contend with. There was talk of congestion on one side and refusing or revising contracts on the other and his view was that compromise would have to enter into the policy of both sides. He also commented on the exchange question.

Throughout Mr. Andrews held out no hope as to future prospects. He is a keen and shrewd business man and when his views are not too hopeful it may be taken for granted that from a sellers point of view the market and the conditions governing it are not healthy.

Pulp Contracts.

The depression prevailing in the British paper industry has caused attention to be directed to pulp contracts. There is a certain amount of revision going on just now and there is a sort of give and take policy, sellers of pulp showing every consideration for their customers in the present "live and let live" condition in trade. Unfortunately the outlook for paper is still none too rosy and so long as it prevails in this depressed condition pulp men must expect grievances and discontentment, followed by little buying.

In Scandinavia, depression is reported to be very keen and the pulp situation is critical.

Prominent Newspapers Amalgamate.

Owing to the cost of paper and other expenses the London "Pall Mall Gazette" and the London "Globe" have merged. This is an indication of the state of things prevailing in newspaperdom. There are among the oldest papers in England. Another amalgamation has taken place down South. At Plymouth, the "Mercury" has merged with the "Western Morning News," which means that another old and highly respected organ disappears. Apart from the loss in the consumption of newsprint, the merging means considerable unemployment. The recent cost of production has hit some newspapers very hard and, of course, paper comes in for a fair share of the blame.

North of Ireland Paper Mill.

The North of Ireland paper mill made a profit of £31,869 in 1920 and has brought in, £32,587 making the fund £64,458. In July last an interim dividend of 2 shillings was paid per share and the directors now propose a final dividend of one shilling and six pence. The sum of £22,456 has been carried forward. The Sittingbourne paper mill has declared an interim dividend of 9 pence per share.

China Clay Works Sold.

Messrs. H. D. Pochin & Co. Ltd., have sold their China clay works at Burngullow to the Tehidy Minerals Ltd. The capacity of the works is about 20,000 tons per year and Messrs. Pochin & Co. Ltd., had them for over 40 years. Messrs. Pochin will now devote all their energies to their Cornwall mines they still own.

PULP AND PAPER NEWS

A strike inaugurated by the employees of the Beaver Wood Fibre Co. Ltd. at Thorold, Ont., some days ago continues to some extent although the company claims that plant is practically in full operation again and that the strike is broken. The plant is being guarded by a detachment of Mounted Police, although the international union officials have issued orders to local presidents that the unions themselves are to arrest and prosecute any member who commits acts outside the law. The company issued eviction notices to all striking occupants of Beaver board houses and these will be tested in the courts. It is claimed by the men that wages were reduced 30 per cent after a promise of old conditions on resumption of operations. Collective bargaining is also one of the points in contention.

A somewhat dramatic termination of the timber probe in Toronto followed the issue of a writ of injunction by the Spanish River Pulp and Paper Mills Limited asking that the Riddell-Latchford Commission be restrained from making further investigations of the company's affairs. At the last sitting of the commission Justice Riddell made the announcement that nothing more would be done until the jurisdiction of that body had been determined by a court of justice. "We think it would be improper for us to proceed with any part of the investigation so long as there can be any, or the slightest, doubt of our authority to proceed," said the commissioner. The company refuses to produce anything pertaining to their affairs which has not passed between officials of the Government and officials of the company regarding business of the company with the Government and declines to produce any documents relating to the application of September 19th 1919 for the 5,500 square miles of pulpwood made to the Hearst Government, or to the loan of $5,000,000 or $3,500,000 from Peabody, Houghtelling & Co. In a statement issued later an official of the company said that the company's action was entirely due to the fact that they were asked to produce certain papers and documents relating to the business and finances of the company, and to the personal affairs of certain of the officers of the company which had no relation to the subject matter of the enquiry. In this connection it was stated that the private banking and stock transactions of the individuals were to be enquired into, and feeling that the production of documents of this kind were not relevant, but unjustifiable, the company has appealed to the courts to preserve the sanctity of the personal affairs of its officials as well as its own. "It is not that there is, or ever was, anything to hide," stated the official, "but the suggestions made during such investigation might have serious effects upon the credit of companies and individuals without the slightest justification."

W. J. Bell of Sudbury, general manager of the Spanish River Lumber Co. and Mrs. Bell and Percy Wilson and George Gray of the Spanish River Pulp and Paper Mills, Limited, Sault St. Marie, were at the Queens Hotel in Toronto last week.

Mills production of paper from the Crabtree mill of the Howard Smith Paper Mills, Limited, will commence within the next few weeks, the work of installing new paper-making machinery having now been completed. The production from this mill will bring the capacity of the Crabtree plant up to 40 tons per day and will give to the Howard Smith mills a capacity of 100 tons a day.

Stuart Delarus, of Shuter, Herts, England, whose firm makes all the bank paper requirements of the British Isles spent some days in Toronto last week.

It is rumored in newspaper circles in Hamilton and Toronto, although denied by the liquidators, that the Toronto World, a morning paper, which made an assignment some months ago but is still being published, is about to be purchased by the Southam interests, in which event it would be put out as an evening paper. It is known that the Southams are ambitious to owe a string of papers across Canada. They already own the Calgary Herald and the Edmonton Journal and are heavily interested in the London Free Press. They recently secured a controlling interest in the Winnipeg Tribune which absorbed the Winnipeg Telegram.

The Pulp and Paper Magazine is advised that Mr. Thomas Fynes has resigned as Director of the Manouan Pulp and Paper Co., and that the Continental Paper and Bag Mills, of which company Mr. Fynes is Secretary, has no interest, financially or otherwise, in the Manouan concern.

Mr John F. Ferguson, of Holyoke, Mass., was in Montreal and Ottawa, February 2nd to 4th, looking into some new engineering work in connection with the paper industry, and returned very much impressed with the optimistic views in general of the business men in the paper and pulp industry of that district. Mr. Ferguson is a specialist on Steam and Electric Power.

The Wilkinson Paper Co. Limited, have taken over four floors of the premises at 76 Bay Street, Toronto, and have now commodious offices and wareroom space above the main floor. At present only two of the four floors are being utilised.

Mr. A. G. Dugan, chief of the chemical research department of the George H. Mead Co., was in Toronto for a day or two last week.

Mr. A. G. Pounsford, general manager of the Port Arthur Pulp and Paper Company, Limited, was in Toronto last week on the way back after visiting the pulp and paper mills in Michigan, Ohio, Wisconsin and other states where he looked into business conditions generally.

The Chronicle Publishing Company of Peterborough, Limited, has been granted incorporation under the Ontario Companies Act with power to carry on business as printers and publishers. The capital stock is $25,000 and the head office is Peterborough. The provisional directors are David Hardie, Adam Henry Frick, Vincent Edward Crebar and Thomas Tooms.

Mr. John F. Taylor, secretary-treasurer of the E. B. Eddy Co., Hull, Que., spent some days in Toronto last week.

Mr. C. E. French, who for the past year has been connected with the head office of the Howard-Smith Paper Co. in Montreal, has joined the staff of the Toronto office in the Royal Bank Building. Mr. French is an overseas man, having gone to England with the 91st Battalion and later having transferred to the R. A. F. He was employed in the office of the Federal Paper Co., at Montreal, after his return from overseas.

Word from Victoria announces the death in Victoria Hospital of Milton Robert Jennings, editor and general manager of the Edmonton Journal. Deceased was born at Warsaw, N. Y., in 1874 and was educated at Rochester University. For several years he was circulation manager of the Toronto Mail and Empire.

According to the annual statement of the American Sales Book Company, Limited, profits for the year were $602,679, an increase of 40 per cent, the figures a year ago being $427,237. "Although a falling off in business was experienced during the last quarter, the prospects are encouraging for a gradual return to normal volume during 1921", said President S. J. Moore. Total assets are $5,630,536, increased from $5,369,800 last year. While the company's business is conducted in the United States there are a number of Canadian shareholders and the head office is in Toronto.

Mr. John Cunningham, of the Laurentide Company, and Mrs. Cunningham, have gone on a trip to Florida.

The annual meeting of the Interlake Tissue Mills Co. Limited, was held last week at the head office on University Avenue, Toronto, and revealed a good year's business during the past twelve months, with an optimistic outlook for the ensuing year which will be marked by the starting of a new paper making machine, which is now about ready to operate. All the old officers of the company were reelected. Mr. George Carruthers is the President and General Mnaager; Mr. I. H. Weldon, Vice-President and Treasurer and Mr. S. F. Duncan, Secretary.

The annual meeting f the Lincoln Paper Mills Limited, which was to have been held last week at Merritton, has been postponed until February 22. It is stated that there will be no changes in the personnel of the executive officers.

Mr. T. J. MacFadden who has been in the Head Offices of the Diamond State Fibre Company at Toronto for some months is now covering Western Ontario territory for this concern.

NEWSPRINT TAKES A SYMPATHETIC DROP IN PRICE.

During the latter part of last week, the Canadian Export Paper Company announced the reduction in the price of newsprint from (?) to 5½ cents a pound. This decision followed almost immediately on the heels of the revision of prices made by the International Paper Company who reduced their price to 5 1/10 cents a pound, bringing the price down from $130 to $114 a ton. The change takes effect at the beginning of the second quarter of the current year and agreements made according to it terminate at the end of the first half of 1921.

At the offices of the Canadian Export Paper Company it was said that the reduction was in line with the company's usual policy to mete out equitable treatment to all their customers. They felt that while production costs were still high, it was only fair for them to fall in line with the general movement to bring prices back to their normal conditions. Moreover, it is pointed out that wages are gradually being lowered which in the long run will compensate any reductions at this period. Besides this, it would not be out of reason to assume that concerns will, at their own expense, go far enough to bring about a feeling of confidence among their customers in order to better the prevailing conditions.

Another factor to take into consideration is the exchange gained by exporters of this country who are paid on the funds of their American clients. This in itself will help to offset many incidental costs relative to the handling of paper from the source of its production to the consumer.

Outside of the Canadian Export Paper Company's action there seem to be no indications of reduction. It is, however, intimated in reliable quarters that the mills represented by the George Mead Company, will take steps in unison with the rest, but no announcement of such a policy appears to be forthcoming until later in the present quarter.

There is some question as to how much benefit the International Paper Company will be able to derive from these reduced prices. The majority of their raw material comes from this country for which they pay Canadian plices plus the rate of exchange, added to which is the cost of transporting consignments of pulpwood from remote quarters to the company's mills. It remains to be seen whether the lower prices will be practical. That, of course, depends largely on general conditions.

The reduction in the price of newsprint is merely the outcome of retarded demand which came along in the wake of the slump that began last autumn. At the time of the crash, production had caught up, or in fact, passed the requirements of the hitherto starved presses. Nevertheless many concerns of all kinds continued their intensive advertising in a mood of desperation; hoping to attract business. This method failed, because the tumble had gained too great a start. They then cut down sharply on all their advertising with the result that the enormous quantities of paper which were being rushed to the publishers commenced to pile up. Orders were not necessarily cancelled, but nevertheless, an accumulation began to take place. Now there is more than enough paper which places consumers in a more independent position. It is not necessary for them to pay prices based on demand which were most severely felt in the spot market during the comparatively recent shortage. This is conceded by manufacturers for which reason they are willing to lower their prices. At the same time no forecast can be given for what the latter half of the year holds out to the paper market. Since advertising is such a remarkable reflector of business conditions it may be very fairly assumed that paper consumption similarly gauges conditions. Therefore, generally speaking, the prices to follow this latest adjustment will be graded according to the conditions of business in that coming period.

Copies of "Technical Association Papers," Series I and II, are wanted by the secretary of the Technical Association of the Pulp and Paper Industry who will pay $2 each for copies in good condition delivered at the office of the association, 542 Fifth Avenue, New York.

Technical Section

REVIEW OF RECENT LITERATURE.

L-7. Apparatus for narrowing or rounding fiber strips. Fr. patent No. 505,687, Turk Gesselschaft m.b.H., Germany. Papeterie, **42,** 878, (Oct. 10, 1920). Same as Can. patent No. 205,369.—A.P.-C.

L-7. Bleaching paper yarns and fabrics. Ger. patent No. 299,651, F. E. JAGENBERG, Dusseldorf, Sept. 1, 1916. J. Soc. Chem. Ind., **39,** 400A, (1920). The material is heated for 7 hrs. in a soln. of hydrosulfite, chlorinated for 6 hrs., soured with a soln. of H_2SO_4 and HCl, thoroughly rinsed with first warm and then hot Na_2CO_3 solns. and then rinsed in water. The treatment is repeated, and the product is obtained almost as white as linen or cotton, without its strength being affected. The finished yarn or fabric resembles cotton.—A.P.-C.

L-7. Apparatus for drying yarn windings, particularly paper yarn. U. S. patent No. 1,330,025, E. JAGENBERG, Dusseldorf, Feb. 3, 1920. J. Soc. Chem. Ind., **39,** 263A, (1920). Yarn windings such as paper yarns on cops, crossed reels, and the like, are dried in an app. comprising an air-tight casing, means for production a current of air through the casing, nozzles on the casing which lead the air current through the cops or cross reels, and means for heating the air current. Valves are fitted over the nozzles, and are opened by means of stems when reels are fitted on to the nozzles.—A.P.-C.

L-7. Process for softening paper yarns and textiles. Ger. patent No. 315,834, C. BENNERT, Grunau, March 6, 1918. J. Soc. Chem. Ind., **39,** 330A, (1920). The material is treated with the decomposition products of proteins such as protalbinic and lysalbinic acids or their salts, alone or in conjunction with other suitable substances. When these substances are added to the dyebaths in which cellulose textiles are to be dyed, they promote the absorption of the dyestuff and give more brilliant shades.—A.P.-C.

L-7.Process for waterproofing paper yarns and fabrics. Ger. patent No. 315,412, H. T. BOHNE A.-G., Chemnitz, Dec. 13, 1916. J. Soc. Chem. Ind., **39,** 292A, (1920). The goods are treated with water-sol, oil and sizing agents. Complete waterproofing of paper is effected by pptg. the oil from its aqueous emulsion by means of the weak acids or acid salts on the fiber, with the simultaneous use of sizing agents. The oils may be added to the pulp in the hollander.—A.P.-C.

L-7. Method and means for the manufacture of artificial silk. Eng. patent No. 142,038, C. L. STULEMEYER, Nov. 5, 1919. J. Soc. Chem. Ind., **39,** 444A, (1920). In forming artificial fibers the jets through which the cellulose solns. are squirted are made of Mo which is not affected by acids and alkalis, and is cheaper and stronger than Pt.—A.P.-C.

R-11. Research problems of the pulp and paper industry. D. C. EVEREST, Sec'y and Gen. Man., Marathon Paper Mills Co. Paper, 11-4, 30, (Aug. 4, 1920). A brief outline of the problems of the pulp and Paper industries which relate to the work of the Forest Products Lab.:—specifications for the purchase of pulp wood; rossing, chipping, drying and baling of wood preparatory to delivery to the pulp mill; utilization of lumber mill wastes; utilization of hemlock bark; investigations of the pulping qualities of various woods; utilization of resinous woods for the manuf. of sulfite pulp; use of liquid SO_2 instead of S; various utilizations for waste sulfite liquor; elimination of pitch from sulfite; study of the fundamental cooking conditions in the soda and sulfate processes; bleaching of sulfate pulp; recovery of waste sulfate liquors; utilization of niter cake instead of saltcake for sulfate liquors; refractories for lining sulfate smelters; recovery of by-products from wood previous to pulping; artificial grindstones; recovery of fibers from whitewater; study of the various factors entering into beating; recovery of paraffin paper, etc.; substitutes for $Al_2(SO_4)_3$; investigations of specialties, e.g., fiber containers, indurated ware, artificial silks, twines and textiles, etc. A strong plea is made for much closer cooperation and support on the part of the industry, as the Forest Products Lab. is working primarily in their interests, and the more information they are given the more complete will their results be.—A.P.-C.

R-11. The development of the Forest Products Laboratory. CARLILE P. WINSLOW. Paper, 26, 28, 30. (July 28, 1920). Address delivered at the Decennial Celebration banquet of the Forest Products Lab., Madison, Wis., July 22, 1920, giving the history of the development of that institution and showing the very great importance of the work being carried out, to the nation as a whole and to the pulp and paper industry in particular.—A.P.-C.

ABSTRACTS OF PATENT SPECIFICATIONS.

A-6; N-6. Fuel. Fr. patent No. 492,991, P. HOUDRY and H. C. BOURDELEAU, France, April 12, 1919. Chimie & Industrie, **3,** 454, (April 1920). The following are mixed hot; dried sawdust 50 p.c., coal dust or coke dust 25 p.c., clay 10 p.c., stearin pitch 5 p.c., coal pitch 10 p.c. The mixt. is kneaded and made into briquettes.—A.P.-C.

B-0; Q-0. Injection of liquids into woods. Fr. patent No. 502,024, Société des Traitements Industriels des Bois et Textiles, France. Papeterie, **42,** 552-3, (June 25, 1920). The wood is subjected to the action of the hot impregnating liquor for a suitable length of time; removed, and then rapidly immersed in a cold bath of the same or of another liquid.—A.P.-C.

G-6. Spray for flat screen. Ger. patent No. 314,379, A/S C. HARTMANN, Christiania. Papeterie, **42,** 553, (June 25, 1920). The sprays are made to oscillate through an angle of about 45°, in such a manner that adjacent sprays reach the extreme positions of their oscillations at the same time but in opp. directions. This insures of the stock being always driven in the same direction.—A.P.-C.

G-6. Rotary screen. Eng. patent No. 130,257. Paper Makers' Monthly J.; Papeterie, **42,** 591-2, (July 10, 1920). A cylinder having a permeable covering is

partly submerged in the pulp-bearing water, the pulp being collected on the cylinder while the water passes inside. The shaft of the cylinder is hollow and perforated at suitable points. Tubular trough-shaped arms are attached at the openings and extend almost to the inner wall of the cylinder. As the latter rotates the ends of the arms dip into the water which passes into the cylinder, and it is evacuated through the hollow shaft.—A.P.-C.

K-6. Process for repulping old or waste paper. U. S. patent No. 1,327,590, J. M. BURBY, Webster, Mass., U.S.A., Jan. 6, 1920. J. Soc. Chem. Ind., **39**, 264A, (1920). Also, Worlds Paper Trade Rev.; Papeterie, **42**, 591, (July 10, 1920). Also, Fr. patent No. 503,271, March 13, 1920. Papier, **23**, 132-3, (June 1920). Old paper made from groundwood is converted into chem. pulp by treating with soda, sulfate, or sulfite liquor. —A.P.-C.

K-11. Apparatus for drying paper, pulp, cardboard, fabrics, etc. Ger. patent No. 307,939, H. MALLICKH, Germany. Chimie & Industrie, **4**, 490, (April 1920). The paper, etc., is dried alternately by the cylinders themselves and by a blast of hot air under press.—A.P.-C.

K-11. Process of drying paper. U. S. patent No. 1,-290,360, J. O. ROSS, Assignor to B. F. Sturtevant Co., U.S.A. Chimie & Industrie, **4**, 490, (April 1920). The moist sheet passes over drying cylinder, which it leaves as soon as it is sufficiently dry so that it will not break, and the drying is finished by blowing air on the surface of the sheet.—A.P.-C.

K-11. Process for the drying of goods, and especially cardboard. Ger. patent No. 307,963, Maschinenfabrik, Apparatebau and A. BOLEG, Hersfeld. Chimie & Industrie, **4**, 490, (April 1920). The substance to be dried traverses one or more drying chambers. There is a main air current which goes through the whole length of the chamber, while secondary currents circulate through only certain portions of the chambers. The secondary air currents may be heated.—A.P.-C.

K-14. Machine for transversely cutting paper in the web. Fr. patent No. 502,,422, CHAS. RENE PASQUIER, France, Feb. 20, 1920. Papeterie, **42**, 548-52, (June 25, 1920); Papier, **23**, 131-2, (June 1920).—A.P.-C.

K-14. Cores for paper rolls. Fr. patent No. 502,232, ELIXMAN PAPER CORE CO., Inc., U.S.A., Aug. 5, 1919. Papier, **23**, 129-30, (June 1920). The cores are made of paper coated on one side with an adhesive and rolled very tightly, the ends being protected by sheet-metal caps the inside and outside diams. of which are the same as those of the bodies of the cores.—A.P.-C.

K-21. Composite felt and process for obtaining same. U. S. patent No. 1,288,158, R. P. PERRY, Assignor to The Barrett Co., U.S.A., Chimie & Industrie, **4**, 489, (April 1920). One or several coats of an impermeable substance such as bitumen is applied to a web of paper which is then dried.—A.P.-C.

K-23. Process for the manufacture of copying paper for sandblast designs. Ger. patent No. 307,919, M. ERMES, Germany, Chimie & Industrie, **4**, 490, (1920), 12 kg. of animal size are cooked in one vessel, and in another vessel 8 kg. of molasses with 7 kg. of potatoes reduced to a pulp and 200 g. of machine oil. The two are mixed while boiling. An ordinary printing paper is dipped in the mixt., dried and coated on one side with chalk. The advantage of this process over previous ones is the fact that no glycerine is required. Moreover, the saving in size is 60 p.c. and it is not essential to use blotting paper. The total economy is claimed to be 70 p.c. The finished paper is elastic and adhesive.—A.P.-C.

L-5. Saccharification of cellulosic materials and recovery of citrate soluble phosphates. Ger. patent No. 305,120, Chemische Fabrik Rhenania A-G and F. L. SCHMIDT and G. A. VORTELIUS, Germany Chimie & Industrie, **4**, 474-5, (April 1920). The concd. acids used for saccharification are utilized to attack raw phosphate Monocalcium phosphate and phosphoric acid are first obtained. The $CaSO_4$ is sepd., and then a fresh portion of raw phosphate is added. There is formed a finely divided ppt. of citrate soluble dicalcium phosphate. If the whole of the raw phosphate is added at the start, the dicalcium phosphate is obtained at once.—A.P.-C.

L-5. Purification of sulfite pulp for nitrating or other purposes. U. S. patent No. 1,283,114, V. DREWSEN, Assignor to West Virginia Pulp & Paper Co., U. S. A., Chimie & Industrie, **4**, 489, (April 1920). The pulp is bleached by treating for 4-8 hrs. with an aqueous soln. of bleaching powder, washed, boiled under press. for several hrs. with an aqueous NaOH soln., washed and bleached again with bleaching powder.—A.P.-C.

FORTNIGHTLY ABSTRACT BULLETIN

At one mill in Canada, the enthusiastic technical men have formed a Science Club. A request from them to the chairman of the Committee on Abstracts and Publications for the opportunity to procure the abstracts in convenient form for filing will result in the reprinting of the Review of Recent Literature in leaflet form. The material as published in the Pulp and Paper Magazine will be reprinted every two weeks as a four page bulletin and indexed consecutively. At the end of the year a certain number of bound volumes of abstracts will be made up, the number depending on the demand. Some members will wish to do their own binding in loose-leaf covers.

The charge for this service will be five cents per bulletin, or two dollars a year (four cents each) where ten or more go to the same address.

WELFARE WORK.

In connection with welfare movement among paper mills and the development of works committees and suggestion schemes, which all come under the one heading of "Welfare", I recently heard of a practise prevailing in a paper mill close to London, which provides a chart, posted on the wall of the machine-room, which those engaged in the production of the mill are requested to study and, if possible, develop the output. The results have been successful, I am informed, and the output displayed in figures month after month has brought great cheer to the mill owners and added interest to the men. The chart is simply arranged for the workers so that they can read the rise and fall of the machine's output each day and then at the end of a certain time, the total production of paper is given by one of the office staff. It would be interesting to know if a similar scheme prevails in the machine room of any of the Canadian paper mills for the workers' inspection. (For the information of our correspondent and others, this idea is now a regular feature of many mills on this side.—Ed.)

UNITED STATES NOTES

Officials of the Howland Pulp and Paper Company, Howland, Me., and the directors of the Advance Bag Company of Middleton, Ohio, have come to an agreement looking to a merger of the two concerns. The arrangement, which is subject to ratification by the stockholders, calls for an authorized capitalization of $1,000,000 preferred and $2,000,000 common stock. The reorganized concern is to be known as the Advance Paper and Bag Company. One of the advantages of the consolidation will be to assure the bag plant an almost inexhaustible supply of raw materials, inasmuch as the Howland Company controls pulpwood areas capable of yielding wood for many years to come. It also owns the water power and sulphite pulp mills at Howland. Most of these properties are new and are considered among the best of their kind in the country. The combination, if carried out, will solve one of the bag company's most pressing problems — that of supplying raw material. In recent months it has been at a great disadvantage due to a lack of such a supply.

Among the bids thrown out by the Congressional Joint Committee on Printing was one on stock for 7,000,000 postal cards, put in by the American Writing Paper Company. President George A. Galliver of the company, who has been in Washington contesting the throwing out of this bid, says he is not discouraged by the action of the committee. He declares that his company will probably enter another bid. Several contracts were awarded when annual bidding was re-opened last week, and the American Writing Paper Company received an order for 2,000,000 pounds of U. S. postal card paper of cream bristol board in 44½-inch rolls at $.038 per pound. The Government is said to be saving more than $19,000 through this contract which was based upon telegraphic bids.

Paper bootlaces, made in Germany, are now arriving in America.

Timberland, 85,000 acres in extent, along the St. John, Big Machias and Allagash rivers in northeastern Maine, became the property of the Allagash Land Company of Bangor, Me., last Thursday, by purchase from H. F. Eaton of Calais. The holdings thus acquired are valued at $42,000,000. The transaction gives the company title to all but one township of the former Eaton properties, 262,000 acres of which, on the St. Croix River, were purchased by it a year ago.

An inventory filed in the probate court, Pittsfield, Mass., shows that the late Franklin Weston, prominent paper manufacturer of Dalton, left an estate of more than half a million dollars.

The Merchants' Association of New York City canvassed business houses in New York during the last few weeks in a poll conducted in connection with its campaign to bring about the adoption of daylight saving throughout the Eastern Time Zone. Leading paper houses included in the poll all registered sentiment favorable to the proposition.

According to a report reaching the Far Eastern Division of the Bureau of Foreign and Domestic Commerce, Chinese chemists have worked out a way of making several of the finer grades of paper from a native straw. The process has been advanced beyond the experimental stage and a mill for the purpose of employing it in actual manufacture is now in operation in Shanghai.

A speaking trip in the interests of the Snell forest conservation bill is on the cards for R. S. Kellogg, secretary of the News Print Service Bureau and chairman of the National Forestry Program Committee. Most of the meetings to be addressed by Mr. Kellogg will be in the Middle West.

All of the striking workers of trades allied with the paper industry involved in the controversy with the Crocker McElwain and Chemical Paper Companies, Holyoke, Mass., returned to work last Thursday, bringing to an end a protracted industrial dispute that had its inception some time ago when the employers sought to put into effect an individual contract system. Indications are that the paper makers, members of Eagle Lodge, will also soon return to work. According to latest accounts, a special committee of the paper makers' union was considering advising the men to go back, pending the drafting of a new agreement.

The International Paper Company has cut the price of news print in rolls in carload lots to 5.7 cents a pound for the second quarter of 1921. Further details are given under "New York Markets".

Edward O. Leadbetter, one of the best known figures in the paper industry in the Middle West, died recently, following an operation at St. Luke's Hospital, Chicago. Mr. Leadbetter in 1875, when but nineteen years old, superintended the opening of the first envelope factory west of the Alleghanies. This was the original plant of the Sewell-Clapp Envelopes in Chicago, now one of the largest envelope establishments of its class in the country. Mr. Leadbetter was 65 at the time of his death. He is survived by his wife, two sons and two daughters.

A countrywide fight on proposed wage reductions in the paper industry is forecast by W. R. Smith, delegate to the recent International Brotherhood meeting at Toronto, who, following his return to Kalamazoo, intimated that a demand for the continuance of the agreements entered into last year would be insisted upon immediately in the Kalamazoo district. Mr. Smith is authority for the statement that the papermakers are going to ask for an increase in pay of from 5 to 10 per cent over the amounts paid last year. Speaking of the Union's position, Mr. Smith said: "We are asking that the scale agreed on for 1920 be put in full force this year. We originally agreed upon a 30 per cent increase for 1920, and some of the mills granted only 20 per cent advance. They will be asked to continue the last year's wage agreement in full. Of course, those mills that have paid 30 per cent increase are not in any way affected by our request." Mr. Smith also disclosed the fact that a very active campaign is now being waged to bring all paper mill workers, no matter what their positions, into the union ranks.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, Feb., 19. — With large stocks of paper of all kinds in the jobbers' warehouses and with a natural tendency toward price-cutting, the paper market is in a more or less demoralized state. Although the unloading movement has not gained any great moment, it is a fact that some jobbers occasionally offer paper at prices below manufacturers' costs. It is on record this week that a Toronto jobber was offered a shipment of kraft paper by a manufacturer's agent at what he claimed was half a cent below the cost of production Incidents of this kind, although rather rare, indicate a desire on the part of some houses to unload their heavy stocks, although price-cutting has not become general and most lines are being disposed of at market prices. Stocks now are larger than at any time since the paper slump set in and mills are having some difficulty in disposing of their tonnages. There is practically no buying and consumers of paper are still holding off in the hope of further reductions in price. Whether these will come or not is a matter for speculation. There are those who say that such lines as books, bonds and ledgers have scraped the bottom and will not go lower while others in the trade argue that these and other papers will decline further before the consumer is tempted to buy. Paper stocks on hand are being disposed of very slowly and by driblets. Orders of a sizable nature are unknown to the trade and the printer is still angling for big business without hooking it. There is a disposition in some jobbing quarters to criticise the mills for the glutted conditions of the warehouses but generally speaking the jobbers are taking the situation philosophically and are prepared to take their losses, for the most part, depending on a proper organization and survey of the trade to get at a fair sales price for the various lines of paper and stick to it.

WRAPPING PAPERS AND BAGS.—The demand for wrapping papers is keeping up fairly well although business is being done on a small order basis. The paper bag business is dull owing to the fact that dealers had big stocks just before prices went down, and the desire to unload in anticipation of a further drop in the market. As a consequence there is a rather small volume of business moving between manufacturers and jobbers.

TWINE.—Twine declined ahead of paper but of late the market has been holding fairly steady, although there has been a big falling off in business since the lively market of six months ago. Jobbers report that they are importing very little twine from the Old Country market, the domestic market readily supplying all demands. Jute twines are quoted at from 20c to 35c per pound, according to grade and size of yarn. Finished hemp twine is selling at from 45c to 65c and mattress twine at $1.00 to $1.25 per pound.

GLASSINE AND GREASE PROOF.—Manufacturers report that there was a bigger movement of these lines during February than in January but that trade generally is quiet as a consequence of the dealers being pretty well stocked up. Glassine is quoted at 30c for bleached and 25c for unbleached and grease proof is selling at 21c for bleached and 18c for unbleached.

TOILIETS AND TISSUES.—Cautious buying and small orders continue to characterize business in light weight papers and trade generally in these lines is quiet. Consumers are holding back with their buying in anticipation of lower prices which have not yet come and may not materialize. No stocks of any size are being carried but the mills are running steadily and so far have been able to dispose of their product. The new machine of the Interlake Tissue Mills at Thorold is being tried out and when some slight changes are made will begin manufacture, which should be in a few days now. It has not yet been decided just what lines the machine will be devoted to. The prices announced for light weight papers on January 24th last remain unchanged.

BOOKS, BONDS and LEDGERS.—Although the mills and jobbers are selling at reduced prices, no fixed price list has yet been arranged, although endeavors are being made to get the trade down to a normal and permanent basis in respect to the prices that are to prevail. The mills report a fair volume of business but the output is moving slowly and with heavy stocks on hand jobbers are neither buying nor selling heavily. Generally speaking, the trade is dull.

NEWSPRINT.—The anouncement by the Canadian Export Company of a reduction in the price of newsprint from 6.50 to 5.50 cents per pound this week, was of considerable interest to the trade and to the stock markets which were under some depression as soon as the drop became known. The reduction in price, although small when the big advance during the past two years is considered, is the first real break in the ascent of newsprint as a commodity and as a market factor it is considered an important item. The new price has not as yet affected Spanish River and Abitibi, whose output is handled by the George H. Mead Company. Last year the Spanish River price was 4.90. A prominent stock broker pointed out that even the 5.50 rate is higher than any company had had for any previous year and that none of the dividends shown by paper companies have been shown on the 5.50 cent basis. It was also pointed out that some half dozen of the Canadian paper companies multiplied their outstanding stock during last year, to as much as five shares for one in the case of Abitibi, which procedure, of course, has greatly increased the amount of money necessary to pay dividends at the old rate as compared with the beginning of last year. The drop by the Canadian Export Company followed a cut previously announced by the International Paper Company.

PULP.—None of the mills are running at full capacity and some are still operating under the handicap of power shortage or ice trouble. There is no fixed market for either chemical or mechanical pulp and what sales are being made are at prices covering a wide range. Pulp is still considered as a falling commodity in respect to price and with the unsettled conditions existing very little more than actual require-

ments are being disposed of. One mill is known to have offered ground wood as low as $70 a ton and the price today ranges between that figure and $80. Bleached sulphite is quoted at from $135 to $140 and unbleached at $100.

NEW YORK MARKETS.

New York, February 19—(Special Correspondence)—Overshadowing all developments in the paper market this week was the announcement by the International Paper Company of a reduction in its contract price on newsprint for the second quarter of the current year to 5.70 cents per pound f.o.b. mills for newsprint in standard rolls in carload lots. This price compares with 6.50 cents on deliveries during the first quarter, and represents a decline of $16 per ton. The company also gives its contract customers the option of accepting a quotation from April 1 to the balance of the year of 5.50 cents a pound, or $110 a ton, provided they elect to buy their supply for that period instead of on the basis of quarterly price adjustments.

This is the first reduction made in newsprint prices in quite a long time, and, coming from the largest producer of this kind of paper in the United States, is viewed as rather significant. The prices charged contract buyers by the I.P. since January, 1920, are as follows: First quarters, 1920, $90 a ton; second quarter, $100; third quarter, $115; fourth quarter, $130; first quarter, 1921, $130; second quarter, $114.

The cut in the newsprint contract basis was not unexpected in the trade, which because of the numerous rumors going the rounds recently had been led to believe that some such action would be taken by manufacturers. Moreover, conditions in the print paper market of late have been of a character which implied that contract prices would necessarily have to be lowered. Spot prices on newsprint have been steadily dropping until in the recent past they have been below the contract level, and it stood to reason that manufacturers could not continue to quote figures above that at which publishers could buy in the open market. It was therefore generally expected that the contract basis would be reduced for the second quarter, and the announcement of the International to this effect had no other effect on the market than to create much interest on the part of both members of the paper trade and publishers.

Demand for newsprint in the open market is quiet. Most publishers are managing to get along at present with contract supplies without having to buy for spot delivery, and offers of tonnage for prompt shipment are being made at comparatively low prices. Transient buyers are frequently obtaining newsprint in rolls at less than 6 cents per pound, and there is ample proof that a surplus of spot stocks exists. In fact, manufacturers are commencing to cut their production; for example, it was learned today that the International Paper Company's mills at Chisholm, Riley and Livermore Falls, Me., will reduce operations to five-day-a-week schedule next Monday. Continued offerings of newsprint imported from Europe have a weakening effect on the market and it is plain to be seen that there are fairly large amounts of such paper now in this country for which there are at present no buyers.

Prices on box boards have declined sharply. Following a period of moderately active buying several weeks ago, boxmakers and other consumers have again retired from the market, and, in an effort to obtain enough orders to keep running full, mills have repeatedly cut quotations. Sales of plain chip board have been recorded at $35 a ton delivered New York, while filled news board is freely available at $40. These low prices, which some assert are below the prevailing cost of production, are attracting few buyers, however, and demand is narrow. A majority of board plants near New York are reported operating at close to capacity but they are understood to be rapidly catching up with order and unless buyers resume purchasing very soon, will be obliged to curtail their output.

Wrapping papers have eased off a bit further in price. No. 1 domestic kraft wrapping is offered by mills at 8.50 cents per pound, and indications are that buyers could better this price by another quarter of a cent in some quarters. Tissues are moving in small volume but hold generally steady in price. Tissue mills are running at materially reduced schedule as a result of the market depression.

Reports from New England tell of a very unsatisfactory condition prevailing in the fine paper manufacturing centres of that district. Mills, it is stated, are mostly shut down, and those that are operating are working only two or three days a week. Quotations on writing papers hold at about the levels reached following the recent cut of 15 per cent by leading manufacturers.

GROUND WOOD.—Demand for mechanical wood pulp is slack and the market is in a very unsettled condition. There is no established value basis, other than at the low levels at which some producers or dealers are disposing of pulp at a loss to themselves simply to move accumulations. This basis is between $45 and $50 per ton at grinding mills. Actual sales to jobbers at $45 have been noted, and the pulp involved has in turn been sold to consumers at $47.50 and $50 a ton, yet leading members of the trade insist that these figures are not truly representative of the market on ground wood. Many of the large producers, including those in Canada; are quoting $60 to $65 a ton at mills, for prime quality spruce ground wood, and while they are affecting few, if any, sales at this level, they seem indisposed to accept orders at less, it being the general feeling among manufacturers that the market is destined to firm up within the next month.

CHEMICAL PULP.—As would be expected, with paper mills experiencing dullness in their own product and consequently running on greatly reduced scale, demand for chemical wood pulp is of slight importance. In fact, aside from occasional transactions involving small amounts of this or that grade of pulp needed immediately by consumers for filling in contract supplies, business is close to a standstill. In the absence of actual trading of worthwhile character, it is next to impossible to determine what market values are. Producers and importers as a general thing are pursuing a waiting policy in the belief that present conditions cannot last indefinitely, and are mostly waiting for buyers to come to them for supplies. At the same time, offerings are made from time to time of at least small quantities of pulp at sharp recessions in price, and quotations are on such a broad range that one can scarcely figure out the market level.

The latest quotations received from Sweden issued by the selling association in that country, are reported to be 6.10 cents a pound on No. 1 unbleached sulphite, 6.70 cents on easy bleaching sulphite and 5.25 cent on kraft, these prices being on an ex dock basis here and including the importer's profit. Import houses obviously are mostly naming these quotations on pulp for forward shipment from Sweden, and these figures come



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nearer to representing the approximate market levels on foreign pulp than do the prices quoted on spot lots of Scandinavian pulp which holders are desirous of moving.

Imports of wood pulp at the port of New York this week included 200 bales from Christiania and 256 bales from Rotterdam.

PAPER STOCK.—The principal development in old papers this week has been weakness in low grades. This has been brought about by the retirement of most board mills near to New York as buyers, which evidently have requirements covered for a time. Folded newspapers have sold down to 57 1-2 cents per hundred pounds f.o.b. New York. No. 1 mixed papers at 40 cents, box board chips at 50 cents and No. 1 overissue newspapers at 85 cents. High grades also display an easing tone. Soft white shavings of No. 1 quality are offered at 3.50 cents a pound New York with few takers, and No. 1 hard white shavings are readily available at 4.50 cents. Flat stock holds fairly steady at about 1.50 cents at shipping points for No. 1 heavy books and magazines.

OLD ROPE AND BAGGING. — More inquiry is noted for old rope, consuming mills in several instances evincing increased interest, but quotations are unchanged at about 4 cents per pound New York for domestic Manila rope in No. 1 condition. There is practically no call for scrap bagging and offers of No. 1 packing at 1.50 cents and less a pound mostly go begging.

RAGS—Papermaking rags are moving in light quantity toward mills and prices in most cases continue on the downtrend. So few sales of sizable lots are being made that dealers themselves are at a loss to say what rags are worth today, and prices in the main are nominal. After having held comparatively firm for quite a while, old white rags have started to ease off. Offerings of No. 1 repacked whites to mills at as low as 8 cents per pound f.o.b. New York have been noted, and No. 1 miscellaneous packing is readily offered at 6.50 to 7 cents. Old thirds and blues are little wanted and are available at 3.25 cents a pound at shipping points for repacked stock, while old lace curtains have receded in price to 6 cents. Roofing rags are in probably relatively better demand than any other grade and are selling at a basis of about a cent per pound at shipping point for No. 1 packing. New cuttings are tending lower, with offers reported of No. 1 white shirt cuttings at 17 cents per pound, unbleached muslins at 13.50 cents, white lawns at 15 cents, light silesias at 9 cents, blue overall cuttings at 8.50 cents and washables at 7 cents.

*WHERE TO PLANT FORESTS.**

Another Pennsylvania experience is worthy of consideration. It pertains to the planting of cut-over and burnt-over areas. Immediately after vast areas were cut-over and then burnt-over repeatedly, they appeared to be completely devoid of any woody growth of value. Miles of mountain slopes seemed to be without any trace of tree growth. Then, the best informed and most widely experienced foresters agreed that planting was the only available means of restoring these vast unproductive deserts. But the unexpected has happened in many places. Time has shown that nature works in wonderous ways, and that if fires are kept out of forests there will appear upon our hillsides a fair growth of valuable forest trees. It is quite probable that the conclusions about natural forest replacement in the early days of forestry were based upon past experiences, when fires occurred frequently and did not give nature a chance to show its power.

To date almost 23,000 acres have been planted on the State Forests of Pennsylvania, upon sites ranging from abandoned fields, waste places, burned areas, lumbered tracts, Scrub Oak barrens and Fire Cherry and Aspen covered areas, to the underplanting of mature stands. The 1,200 separate plantations established in Pennsylvania during the past twenty years show that planting may be done successfully and economically, and that plantations are relatively safer from fire than any other forest areas because of the interest the public takes in planted trees and the value people place upon them. But great care should be exercised in selecting planting sites, for planting should only supplement natural forest replacement and not work counter to it. In order that planting may be done judiciously the subject of natural forest succession on different sites and in different regions should be worked out thoroughly before planting is attempted. For only then, will it be possible to know what areas should be planted and where it is reasonable to expect the satisfactory natural growth. It is now clear that nature will do more to restore a forest growth on cut-over and burnt-over areas than was formerly anticipated. Consequently, the extent and methods of future planting must be adapted to this new point of view, which will surely hold as forest protection improves.

*From "Twenty Years of Tree Planting" by Joseph E. Illick, Pennsylvania Department of Forestry, in the Canadian Forestry Magazine, Aug.-Sept., 1920.

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News From Our Advertisers

Beveridge Paper Company, Limited, 628 St. Paul St., West, Montreal, who are well known through their mill supply department as dealers in pulp and paper mill supplies have added several new lines recently, among others the Eureka Packing Company, manufacturers of "Ambest" Lubricated Metallic Packing and Ajax Metal Company, manufacturers of "Ajax" Bull Bearing Alloy.

"Ambest" metallic packing is furnished in loose rope form of long strands of non-friction metal which is easily separated to suit any size rod or box thereby doing away with the necessity of carrying a varied assortment of packings in stock.

"Ajax" bull bearing alloy is a general purpose lining metal which, in addition to the advantage of price, is also claimed to have great plasticity and anti-friction properties.

Among the other lines which Beveridge Paper Company, Limited handle through their mill supply department are Plibrico jointless firebrick and high temperature cements, boiler compounds, paints, waterproofing cements, Flintex concrete hardener and vulcanized fibre.

Diamond State Fibre Company of Canada Limited, are moving to larger premises.

The Diamond State Fibre Company of Canada, Limited, are moving into new premises in the Wrigley Building, Carlaw Avenue, Toronto, on or about March 1st. This building is twice as large as their present premises, and will enable them more easily to handle the great volume of business which the constantly increasing demand for Diamond Fibre products has brought about. They are equipping a thoroughly up-to-date show-room for visiting customers where they can inspect Diamond Fibre Products at their leisure from every angle. A private railway siding will facilitate greatly the prompt delivery of shipments. The Diamond State Fibre Company are to be congratulated on the very satisfactory reception of their products which has necessitated enlarging their accommodation.

Trimbey & Allen

This is a new concern that started in the manufacturing of special pulp and paper machinery, with the beginning of the erection of a shop at Glens Falls, N. Y. last June. The machinery being built is that of which Mr. Trimbey and Mr. Allen hold the patent rights such as the Trimbey Automatic Consistency Regulator, a device well known in the mills of the United States and Canada where there are now something over 100 in use, over half of which were sold on repeat orders unsolicited:—The Allen & Trimbey Automatic Continuous Mixing Machine is device to which the various ingredients entering into the finished paper are supplied in solution or liquid form, of a definite consistency controlled by the above mentioned Consistency Regulator, this apparatus then causes to enter the finished mixture the various amounts of the several ingredients for which it is set. The proportions of any or all the ingredients can be changed by the operator at will but once set they remain constant. The control being mechanical rather than manual, the resultant mixture is constantly uniform. The whole apparatus is automatic and as near fool proof as machines are built. Something of the savings in power and labor can be gained from the amount that will be saved in one Canadian mill of two newsprint machines, now using beaters for mixing their stock. Figuring power at $50.00 per H.P. per year and beater room labor at 30c. per hour, the installation of this system will effect a saving of $13,450.00 per year in this mill. This takes no consideration of the savings in maintenance, floor space, and increased production due to a constant, uniform stock mixture. Another device, the invention of Mr. Allen, is for the automatic control of the whole sulphite cooking operation. By experiment, the rate of steaming a digester in order to obtain the best pulp for the purpose desired in the least time is determined, then this apparatus will repeat this rate of cooking automatically with each succeeding cook, effecting a large saving in time, steam, coal, labor and give the thing always looked for in sulphite mill operation, uniform plup. Then too Mr. Allen has devised a Weightometer by means of which the production of pulp or amount used can be accurately weighed or metered, by which acid can be metered, chips weighed into the digester or coal into the boiler plant. Further the Salesman Engineer, Mr. H. D. Wells has evolved an Improved Rotary Sulphur Burner which combines in a very small space, burner, melting tank and combustion chamber, has very large capacity and required less than 1-4 H.P. to operate the largest size. While some concerns are reporting the slowing up of business, that of Trimbey & Allen is growing and booming simply through the inherent merits of the apparatus they are building. Orders are at hand to keep them running to



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capacity well into the Summer with much more on the way.

Besides the business of manufacturing, the services of Mr. Trimbey are in great demand as a white water expert. There are few mills to which he cannot point out where they are sending good money down the river in white water. It is coming also to be a by-word that if you have an unsolvable problem, put it up to Allen and he will start up his pipe and smoke out a solution.

GOOD REPORT FOR PROVINCIAL PAPER

One change was made in the directorate of Provincial Paper Mills, Limited, at the annual meeting held in Toronto on Feb. 16, the name of Charles S. Campbell, of Kalamazoo, Mich., being substituted for W. M. Loveland of the same city. The attendance at the meeting was not large, but those present heard with pleasure of the satisfactory year reported by the company. President I. H. Weldon, in his report, said:—

"During the year there was an abnormal demand for the product of your mills, enabling all plants to run to capacity, and this, with the high values, made our total sales reach the high record of $7,658,176. We have pursued the policy of making our product of a quality and at a price which compels Canadians to buy in Canada. It would be impossible at this time to say definitely what our business will be for the coming year, but intimations from catalogue and periodical publishers would indicate an increased demand. Present commitments, while less than at the corresponding period of last year, are quite satisfactory.

"When organizing the company, provision was made for financing future extensions by authorizing $3,000,000 twenty year 6 per cent. bonds; $200,000 of these bonds have been exchanged for a like amount of bonds that were outstanding against the Port Arthur Pulp & Paper Company, Ltd., thus enabling us to discharge the prior mortgage on the Port Arthur mill; $305,000 of the bonds were sold for cash, the amount being invested in Canadian Government Victory bonds for use when further building operations are commenced.

"During the year we received from the Ontario Government the rights for 21 years to cut pulpwood on an area containing over 1,300 square miles. Now that our supply of pulpwood is assured, we are in a position to proceed with our plans for the extensions at Port Arthur, which include a paper mill."

The profit and loss statement shows profits for the year after allowing for 1921 war tax, of $1,225,775.

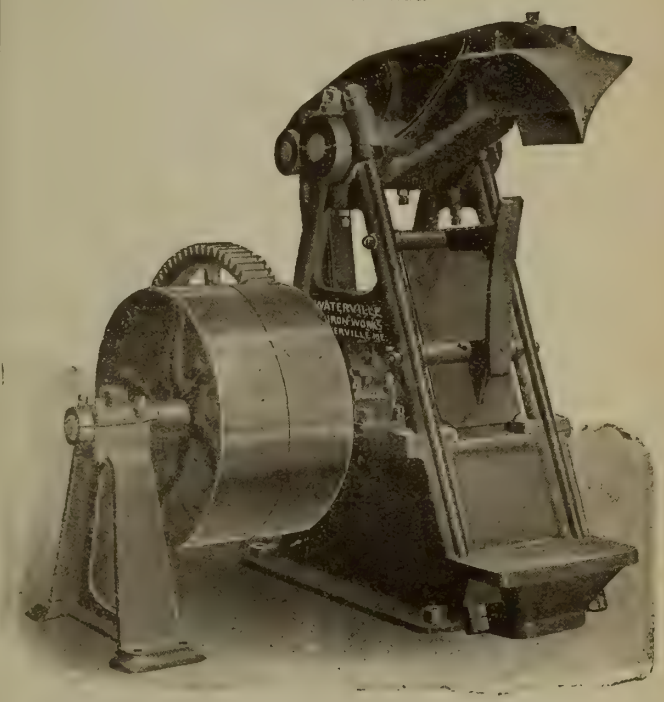
During the year some $200,000 was set aside for depreciation on buildings and plant, against $75,000 in the previous year, and after paying preferred dividends and all other charges, there was available for common dividends some $890,903, against $223,408. Some $257,500 was paid in common dividends, against $90,000 in the previous year, and there was a surplus for the year of $633,403, against $133,408 in 1919.

The balance sheet of the company shows a good cash condition. Cash on hand total $315,166, against $110,902, and accounts receivable are set down at $811,600, against $435,612. Victory bonds at market are placed at $396,800, against $15,000. Current assets aggregate $1,791,052, against $1,260,585, and surplus of current assets over current liabilities exceeds one million dollars.

Of course, as all the above comparisons are the figures of the consolidated operations in 1920, against the operations of the paper company alone in 1919, they cannot be taken as actually comparing the same scope of operations, but can only taken relatively.

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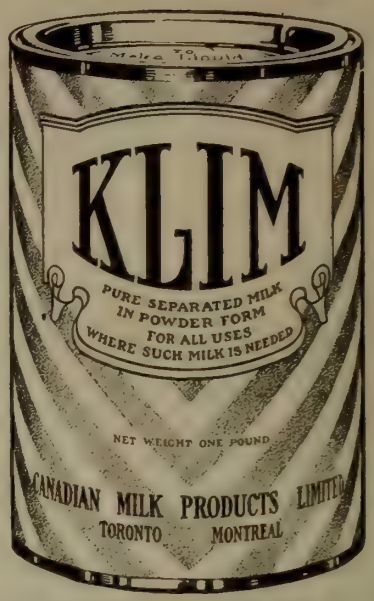
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VOL. XVIX. GARDENVALE, P. Que., March 3rd, 1921. No. 9

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Room 205 Drummond Building, Montreal, 'Phone Uptown 7773.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

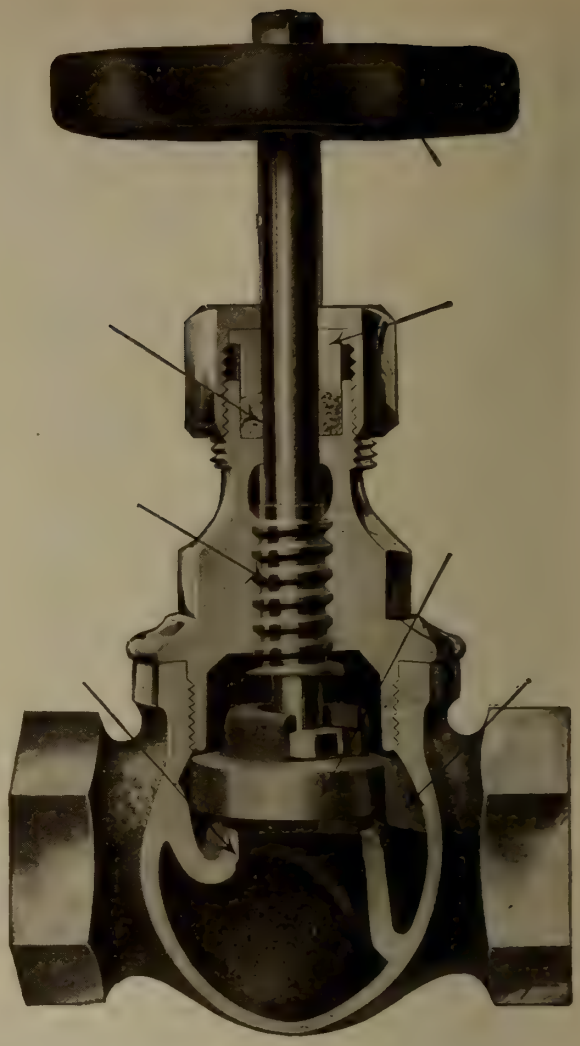
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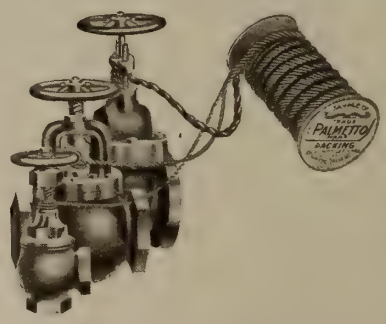
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EDITORIAL

A LITERARY REVIVAL.

The publication of books relative to the Pulp and Paper Industry has received very little attention in the United States and in Canada for many years. Since the appearance of the *Chemistry of Paper Making* by Griffin and Little in 1891 and of the *Manufacture of Paper* by Davis in 1886, we are not aware of any important contribution that has been issued in book form on this continent. A little "Story" of paper manufacture was contributed by the Butler Paper Company a few years ago and an extensive history of the industry in the United States by Senator Weeks appeared serially in the Paper Trade Journal and has since been issued in book form. Americans and Canadians have been by no means indifferent to the advances in the theory and practise of pulp and paper manufacture nor have they been slow to contribute information through the pages of trade periodicals; in fact many interesting and valuable contributions to the advancement of the industry have been made available in this manner. For the making of books on the technical and practical side of paper making, however, we have had to depend almost entirely on England and Germany. Nothing very recent has come even from France although there are some good treatises available in that language. England particularly has been the source of information for most pulp and paper makers, especially if they did not happen to be familiar with the German language so as to avail themselves of the writings of Hoffman, Herzberg, Schwalbe, Kirchner, and others. England may well be proud of the list of excellent books on paper making from such authors as Cross, Bevan, Sindall, Clapperton, the late Clayton Beadle and the more recent writers, among whom we might mention Bromley, Dawe, and Strachan.

But the writings of these gentlemen, excellent as they are, do not entirely supply the need of those engaged in the pulp and paper industry on this continent. England is not a manufacturer of pulp and the grades, sizes and qualities of paper frequently differ from practise on this side, while conditions on the continent vary in several respects from those in North America.

It is very gratifying under these circumstances to note that within the last few months a number of outstanding contributions to the literature of pulp and paper manufacture have been made by writers west of the Atlantic. The first to appear was *Modern Pulp and Paper Making* by George S. Witham, Sr., who is well-known personally to a great many engaged in the industry and by reputation to nearly everybody else. His book is the first of its kind since Davis, to be credited to an American. A review has already been published in the Pulp and Paper Magazine so that we need not go into any detail. The book represents almost a lifetime of experience in the manufacture of wood pulp papers and with the exception of differences in operations involved in the manufacture of paper from other fibers, may be said to cover quite comprehensively the processes for the manufacture of the various kinds of pulp from wood and the conversion of pulp into papers.

The next notable contribution is that of Edwin Sutermeister on the *Chemistry of Pulp and Paper Making*. This book deals with manufacturing processes only so far as a description is necessary for the intelligent discussion of the chemical principles involved. The addition of the "pulp" to the title of the classic of Griffin and Little is necessitated by the great strides made in the development of wood pulp manufacture. Mr. Sutermeister's years of experience as chemist with a firm noted for the excellence of its papers manufactured both from rag and wood fibres and their conversion in part into coated paper and the fact that both sulphite and soda pulps are manufactured and bleached on the premises, gives a feeling of dependability on what the author has to say which certainly gives a greater value to the work. We have here a book which deals almost entirely with the principles involved in pulp and paper manufacture and as the matter is dealt with in a comprehensive manner and written with Mr. Sutermeister's characteristic easy and interesting style, it is a book which the student should delight to read. It supplements the work of Mr. Witham by taking up in detail the more technical and scientific phases of the industry.

It is interesting to notice the attention that is being given to this industry by others. We find in a book on *Forest Products, Their Manufacture and Use,* by Prof. Nelson Courtlandt Brown, that the very first chapter is on the manufacture of wood pulp and paper and occupies forty pages. This chapter is by Mr. T. J. Keenan, F.C.S. Secretary of the Technical Association of the Pulp and Paper Industry, and gives a very good general description of the processes involved in the pulp and paper from wood.

Another little book that deserves attention is that entitled *How Paper Boxes are Made,* by Robert F. Salade. This book has found a ready reception in the paper box industry and evidently fills the need.

Another book has appeared which marks a distinctively different phase and indicates an important step in both the literary and the educational development in this industry. This is volume one of the *Manufacture of Pulp and Paper* which is being prepared under the auspices the Pulp and Paper Industry of the Continent in order to provide both an elementary and comprehensive description of the principal processes and equipment required for the manufacture of the various grades of pulp and paper as practised in the United States and Canada. This first volume deals with some of the fundamental subjects, elementary mathematics and science, which have been found essential to an intelligent comprehension of any satisfactory discussion of principles and manufacture operations. The second volume, which will be ready in April, will complete this preliminary instruction. The third volume will cover the manufacture of pulp and the fourth and fifth the manufacture of paper.

It is now two years since the project was approved by the American and Canadian Pulp and Paper Associations and there is an occasional expression of impatience at the time taken up in issuing the work This criticism may be partly justified but a brief consideration will show that most books are personal ventures and are published when the author has been able to finish his work. The committee in charge of the Industry's book was not content to have such a one-man affair when such a broad field was to be covered, so the best man available in each department was engaged to contribute the section dealing with that branch. Some of these men have been working under very serious handicaps in the endeavor to complete their work promptly. One man, for instance, suffered for months from rheumatic fever but continued to give what attention he could to the preparation of his work. The same may be said in some degree of a number of others. It has thus been difficult in some cases to have the manuscript delivered promptly. By far the larger part of the manuscript is now complete and if this could be delivered immediately to the publishers a definite date could be said for the appearance of the remaining volumes. But it is not the committee's purpose merely to turn out a set of books; the intention is to have these the best possible books and furthermore to have them suitable for class room, correspondence or home study, as well as for reference purposes. To this end and also that the text may be in the same style and language, most of the manuscript must be re-written and the numerous illustrations must be properly prepared. All this consumes both time and money and it is fortunate that so many of our authors have been willing to contribute their valuable time and that the industry has so generously contributed the necessary funds for making this a work that will be worthy of bearing the name of the Pulp and Paper Industry of the United States and Canada.

The Canadian Pulp and Paper Association at its last annual meeting, for the third time, voted an appropriation of $5,000 towards the completion of this work. This is 50 per cent more than the estimate made more than two years ago indicated as necessary. It is patent that a publisher or an individual could not afford to produce such a work alone, even if he were qualified. American mills and their friends who appreciate the need of having an authoritative treatise on the work done by the pulp and paper manufacturer, contributed up to April of last year somewhat more than $20,000, since which time the campaign for funds has not been continued. It is evident that an increase in the original contribution from the United States mills will be required if the work is to be properly done and completed along the lines which have so far produced a volume that has met with unqualified approval. It is understood that the contributions so far received have come from about one hundred concerns. With something like eight hundred paper mills in the United States it would seem that either some did not read their invitation to contribute to the work, or have not appreciated the size of the task nor the opportunity extended. It will be a pleasure to the editor to give further information to anyone who has not contributed to this work or wants to increase his contribution, as the Canadians have done and who wishes to know more of the details and of the plans of the committee for the practical application of the text books to the instruction of those engaged in the manufacture of paper or in its distribution and use.

Thus we would summarize what might be called a renaissance in pulp and paper literature on this side of the water. We believe it signifies an increase in the general intelligence and an increase in the appreciation of the necessity for applying scientific methods and intelligent operation in even the most commonplace processes of our industry. As a sure result of this awakening there will be an increase in efficiency and a growth in the interest and consequent contentment and enthusiasm of workers which will result in higher grade and greater volume of product at a margin of profit which will prolong the period of good wages and improve on even present standards of working conditions for everyone connected with the industry.

HONOR ROLL WANTED.

The Canadian Pulp and Paper Association would like to get hold of any spare copies there may be in existence of the Honor Roll which was published by the Association. Please address them to the Secretary, 701 Drummond Bldg, Montreal.

The export of unmanufactured pulpwood was about 75 per cent greater in 1920 than in 1919. This is a drain on Canada's principal natural capital and should be provided for in a sinking fund of future forests by an export tax to be spent in reforestation.



Street of Houses, Espanola, Ont.

Some Ideas on Industrial Housing

(Special contribution to the Pulp and Paper Magazine.)

Pulp and paper manufacturers, locating their plants, as they commonly do, adjacent to their timber limits and close to their source of power, find that there are locally no adequate housing accommodations for their employees.

The more experienced and progressive of manufacturers anticipate this difficulty and create housing at the same time and in proportion to the plant. Others, following a practice which has given a degree of success in the past, make no move towards relieving the situation, trusting that the acute demand and the

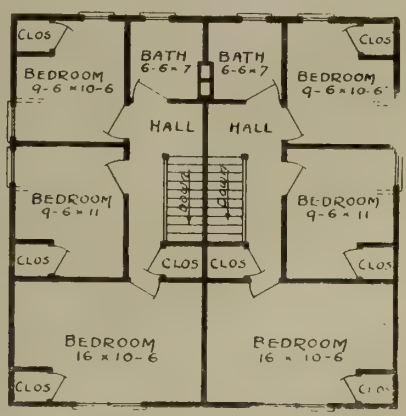


A Pair of Six Room Houses.
Type adopted by the Garden City Development Co.

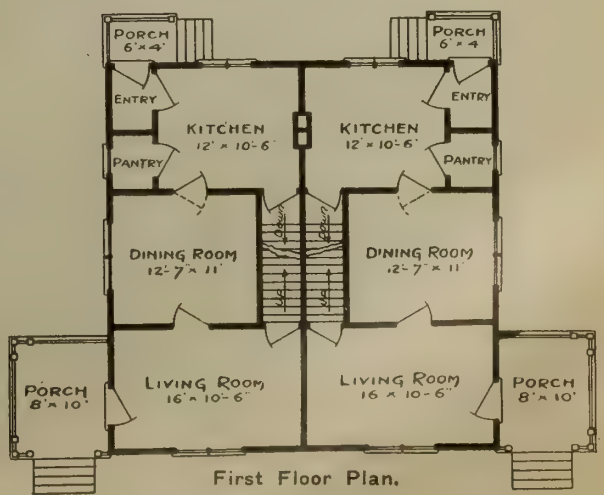
opportunity for a profit will stimulate the speculative builder to action. In the cases where a town already exists and there are other industries competing for the floating labor there is a fair chance that the speculative builder will shoulder the burden and a further chance that workmen with families will build for themselves, but in communities serving a single industrial plant, where depression in that industry means stagnation for the town, it is a courageous man who will tie up his small capital in local real estate.

When the manufacturer decides that he must build houses he faces the problem of deciding on the number required; the size, the best construction to make them weather proof and a choice of designs that will be attractive in appearance.

It is essential that a housing survey be made, and for this purpose it will be sufficient to divide the unhoused workmen into three classes, first, laborers with families, mostly foreign, unskilled and earning a low wage, who



Second Floor Plan.



First Floor Plan.



Street of Houses, Espanola, Ont.

will be satisfied with quite simple housing arrangements; second, skilled workmen with families, earning good wages, wanting and willing to pay for a reasonable degree of comfort and convenience; third, the single men, requiring bed and board only, who must be accommodated in company or privately operated boarding houses.

The workman's home in its simplest form should consist of a weather tight building with four rooms, a combined living room, dining room and kitchen, three bedrooms, one for the parents, one for the sons and one for the daughters, a toilet room with water closet, and a kitchen sink with running water. This house can be expanded to the needs of the workmen with higher living standards by the addition of basement, closets, bath tub and wash bowl with hot water connections, separate kitchen and parlor, front verandah and rear porch.

When the number and sizes of the houses in terms of accommodation have been determined, consideration should be given to the type of construction to secure cheapness, warmth, low upkeep charges, and a reasonably low conflagration hazard. The frame house is the cheapest, and if certain features be taken care of, it can be made to fulfil the other conditions. Many structural features are subject to differences of opinion but the following can safely be assumed to have been proven in practice.

It is essential for warmth that the ground floor of all dwellings have a double floor consisting of a sub-floor, builder's paper and a matched floor.

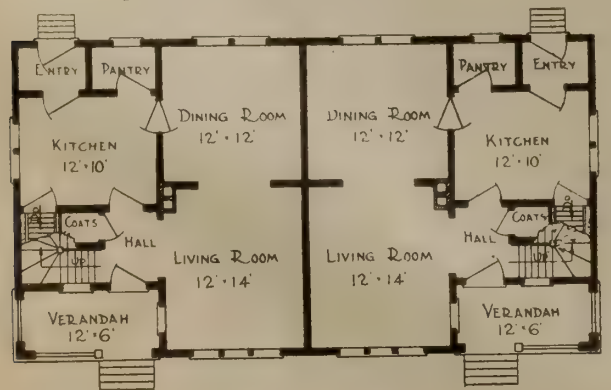
Lath and plaster makes the best interior finish for wall, partitions and ceilings. It is warm, practically air tight, a low fire risk, and vermin proof, and except in neighborhoods where there is heavy blasting, where it would tend to crack, there is no finish to equal it. In some parts of Canada it is the custom to addition-



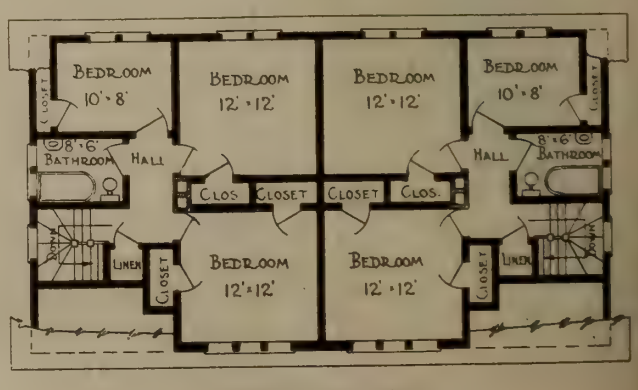
A Pair of Six Room Houses.

ally insulate the outside walls by "back plastering" or by the use of sheathing under the lath and plaster. This adds considerably to the cost for material and still more to the labor. A very satisfactory result can be had by lining the inside of the outside walls with gypsum board and plastering directly on it.

For the roof, inch sheating and either slate covered asphalt felt shingles or slate covered asphalt felt roofing in rolls, make the best finish. The asphalt felt is



First Floor Plan.



Second Floor Plan.

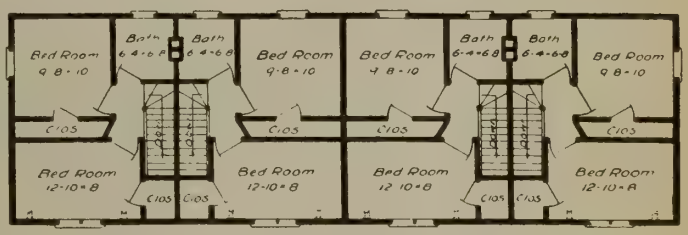


Terrace of four — four room houses.

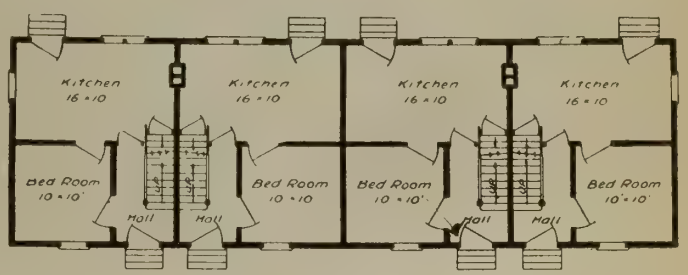
warmer than cedar shingles and compares well in durability, it also gives better protection to the houses in case of a general conflagration. The natural colors of the crushed slate present a permanently attractive appearance.

The outside walls should be sheathed, covered with a heavy tar felt and finished with either matched siding and paint, clear cedar lap siding and stain, cedar shingles and stain or metal lath and stucco. Of these siding or shingles with stain will be the cheapest and will have a presentable appearance for a number of years. A matched siding with three coats of paint is rather costly, and if the buildings are to look well they must be repainted every three years, which makes quite an item of upkeep expense. The stucco finish on metal lath, while costing a little more than siding and paint, has many advantages over it. The stucco makes a warm, air tight, weather proof finish. It is to a high degree fireproof and carries with it no upkeep charge for painting or staining.

Storm sash and doors are a necessity in the extreme



Second Floor Plan of Terrace.



First Floor Plan of Terrace.



A Community Boarding House.

cold weather of the Canadian winters, so they should be figured as an essential part of the house.

Electric wiring can practically always be put in as every mill now has a suitable generating plant to supply the current. Oil lamps are unhealthy and constitute a serious fire menace.

When the proposed housing survey has been completed it will appear that the requirements can be satisfied by a number of single or double houses of five, six or seven rooms, or possibly a number of houses of four or five rooms built in terraces and with one or more boarding houses for the single men. There will then remain the task of finding suitable designs and of all phases of the housing problem this is the easiest to settle casually and the most difficult to accomplish well. To get a house of any given capacity, the attractive appearance of which is dependent on its lines and coloring and not on expensive ornamentation and which at the same time has a really excellent floor plan, is a very difficult matter, and when the third limitation of extreme economy is added there remain very few houses which answer the full description.

There are a number of firms manufacturing partially fabricated houses who specialize in homes of five to seven rooms. These firms, as would fairly be expected, have in the course of years evolved and collected a line of standard houses many of which are quite unique. It will well repay the prospective builder to secure some of their catalogues and give them careful study. It is foolish to spend time and energy in an attempt to design the ideal home when a very close approximation to it is to hand.

Among engineers the possibilities of the fabricated or ready cut house will arouse a ready interest. Their training and experience have developed an appreciation of the enormous possibilities for efficiency and economy there are on any job which is intelligently designed in the drafting room, accurately and systematically "billed off" and put through a shop where large production and efficient methods have reduced costs to a minimum. Then when the field work is put through at high pressure, from graphic plans and with material that is all on the job when wanted, the maximum of engineering efficiency is attained. The contrast is very striking between this method and the common practice of not only fabricating, but largely designing the house, as it is tediously erected, from materials some of which are only ordered as the need for them arises.

Pictures of a few finished houses and typical floor plans are shown in the illustrations. The first design is the kind adopted by the publishers of the Pulp and Paper Magazine for six pairs of houses.

There is a tendency on the part of manufacturers to slight the whole housing problem and when they are at last forced to admit the fact that houses must be built they pass the problem along to the boss carpenter, who, excellent as he doubtless is in his own line, is not a competent industrial housing architect, nor is he widely experienced in town building. There is much to be said in favor of employing one of the housing companies who supply ready cut houses. They illustrate in their literature many attractive designs of proven utility on which they should be able to give very short time delivery. Naturally it will be necessary to pay them a profit on their operation, but their method is fundamentally sound and the chances for economy so many that there is little doubt that they will achieve, along with a high class housing community, a very substantial saving in money.

RESUMPTION OF TRADE IN FINER PAPERS.

If enquiries are an indication that buyers are interested, then the concluding days of last week saw the first signs of a revival in the market of finer papers. At the offices of the Canadian Export Paper Company it was said that more than one dealer had shown that he is ready to supply the gradually diminishing stocks of retailers who have done no buying since the beginning of last autumn. From this it appears that consumers cannot carry on indefinitely with what they have and that the time has arrived when demand is to come from out of its hiding place.

Prices in this line of papers are sure to be up for a long time to come. Although they have dropped a hundred per cent since the ceiling had been hit by all commodities, the rebound seems to have defied the laws of gravitation as prices remain about half-way between the 1914 level and the peak. In cold figures it means that quotations at present are eighty five per cent. above those of the years immediately preceding the war.

It would seem that there should be a constant demand for these finer grades of paper, especially those which are used in correspondence by every firm. Even during slack periods communications are being carried on between business concerns and the volume of paper which is consumed would appear to justify a constant demand for it commensurate the proper conducting of all inter-company business. For this reason it will be asked why the buyers are so backward and conservative about purchases even at this time. In the case of newsprint, the consumption of which so largely depends upon the amount of advertising done, it is very possible for even half of former shipments to become surplus to the requirements of publishers at this time. Curtailment of advertising has created many full warehouses.

But such did not affect the market of finer grades of paper. Sluggishness there may be explained by the fact that during the shortage, dealers fearful lest they be left with empty shelves at that time adopted a method of what might be termed grand wholesale purchases. That is, when the outlook for deliveries was discouraging, they would order not only the required amount from their regular mill but put in three and four calls for the same quantities at other manufacturers. With the crash in the early part of the fall, some who had paid for everything they bought found themselves with more than they needed for a long time while those who were warned of the coming state of affairs curtailed their orders. This latter move may not have harmed them, but in the general trend of conditions, threw the market into distortion as far as going necessities were concerned.

The outlook, now, however, is for distinctly better conditions in a short time.

FIGHTING RAILROAD RATES IN ENGLAND.

I have commented at times on the high railroad rates in the United Kingdom and the deterrant effect they have on pulp and paper transport. The Dowside Paper Company have now gone to the extent of chartering a steamer to carry their newsprint from Aberdeen to Edinburgh and Glasgow. By this means they are combatting high railroad charges and the steamer proves much cheaper. The vessel will now trade regularly between these ports. Motor transport is also now adopted by a great many mills to run their supplies by road to their customers.—J. R. B.

Export Tax or Embargo on Canada's Fee Land Pulpwood Imperative

By Frank J. D. BARNJUM, Annapolis Royal, N.S.

In the bulletins which I have so far published, I have merely scratched the surface, as I do not wish to create a panic in timber or paper, but the condition of our standing wood supply has now become so alarming that it is time something should be done to awaken the public interest in this vitally important matter and that the people should be apprised as to the tremendous loss that has been suffered through the ravages of the bud-worm in our standing wood supply, which now amounts to a national calamity.

This scourge has swept across the entire Province of Quebec, covering an area of more than seventy-five million acres from the Saguenay River as far west as the Province of Ontario, as far north as the height of land, and as far south as the boundary line of the United States, taking in the entire Province of New Brunswick, causing a loss of approximately one-half its visible supply and has now begun its infestation of Ontario.

In this vast area there are but few sections that have not been visited by this pest. In some spots the loss has been less than others, and it varies all the way from 15 to 100 per cent. Some authorities have said that the fir or balsam growth has not been entirely killed and a portion may recover, but if they will examine these trees closely they will find that immediately on the departure of the bud-worm this growth has been attacked while in its weakened condition by either the bark beetle, bark weevil, ground rot, heart rot, or sap rot. These pests are at work completing the job begun by the bud-worm, so that it is perfectly safe to say that all the fir or balsam growth is doomed in the above area.

The result of this terrific invasion is appalling; for the amount of loss to our timber supply staggers the imagination. Thus far no one has cared to paint the picture as it really is.

The amount of fir or balsam in the above territories south of the height of land in Quebec has always been estimated as running from fifty to sixty per cent. in its ratio to spruce so, calling the stand only fifty per cent. balsam, it means a loss of at least one half of our estimated stand of available pulpwood in the Province of Quebec, or seventy-five million cords, as Quebec's available supply was estimated at one hundred and fifty million cords.

One may figure it in another way by simply calling it a loss of merely one cord per acre on the seventy-five million acres (a figure which no one will attempt to dispute) and you still have the same result, viz., a loss of seventy-five million cords. This means, at the present rate of consumption of all wood products, that about twenty years' supply for the Province of Quebec has been wiped out from one cause only.

What small, scrubby, black spruce growth there is left north of the height of land seems to have been avoided by the bud-worm as too tough a morsel for even a parasite.

Now, passing to a consideration of the arch enemy of the forests, fire, the most recent estimate I have seen from loss by fire along merely one line of our railways, between La Tuque and Cochrane on the Transcontinental, amounts to twenty million cords, sufficient wood to have kept the paper mills of Quebec running for ten years.

There is one compensation, poor as it may seem, with relation to our future wood supply, and that is that the money value of what land and wood we still have left has more than doubled on account of the short supply remaining, and this fact we must not forget in considering present prices for pulp, paper, lumber, and wood.

The newspapers are asking for lower prices for paper, while as a matter of fact the manufacturer of paper and lumber is faced with increasing costs in connection with the protection of his forests from fire and bugs, and the only way this can be met is with higher prices. The bud-worm has destroyed such tremendous areas of standing fir and spruce that the fire hazard has been increased a hundred fold owing to the very large areas of dry dead trees in the woods, entailing a greatly increased fire patrol.

Higher prices for land, pulpwood, lumber, and paper is the only practical conservation that I can see, as it will have the effect of preventing waste in these commodities and will enable the land owner to set aside something to spend for increased fire protection, burning of slash, selective cutting, and reforestation.

The time is now here when a careful burning of slash and debris must be practiced as a measure of protection against insect pests and also as a fire preventive measure.

When timberlands in the East attain a value of $50 per acre,which is less than one-half of what it will cost to reproduce, then and only then will there probably be some check in the enormous waste that is going on in the woods in connection with logging operations.

When paper, which has the distinction of being manufactured from the most rapidly disappearing raw material of any of our manufactured products, attains a price commensurate with its real value, which before this product was manufactured out of wood was about twenty cents per pound, then and probably not till then will the present enormous waste in paper be curtailed.

It matters not to the publishers what the price of paper is, so long as they all pay practically the same, as the cost will simply be passed along to the consumer in any event. The interests of the newspaper publishers and the newsprint manufacturers are one, as they are both dependent on the conservation of our forests.

If this partial picture of destruction is not sufficient to cause our Goverment to put a heavy export tax or embargo on our fee land wood, then the complete story will have to be told.

In the past the only argument against this procedure has been that it would be a hardship to the farmer or fee land owner, as it would prevent him from obtaining the best price for his wood; but this does not apply now, for with Canada's more than one hundred pulp and paper mills, and more building, the home market with its shorter rail haul makes the more desirable market, both for the wood as well as for farm produce. With the enormous loss of wood that our mills have suffered we can now afford to pay just as much for wood as the mills of the United States. As a matter of fact, wood is selling in Quebec as high as it is in Maine. The home market for our farm produce has now also

become more important than ever, on account of the customs duties which the United States is piling up against us.

Every mill erected in Canada means another town and just so much more demand for the product of the farm as well as more freight for our railroads, as every car of wood hauled to a paper mill means four additional cars of other material and supplies, which would increase the income of our railroads enormously. It would mean the haulage of five hundred thousand additional carloads of freight if the million and a quarter cords of fee land wood now exported to the States was manufactured in Canada.

In addition to all of the above facts, the item of the difference in exchange is a very important one. When we ship out a cord of wood, there is only a matter of twenty-five dollars left in Canada, while if this cord of wood is manufactured into paper it would leave with us nearly three times as much, or seventy-five dollars. In other words, the million and a quarter cords of wood we shipped out last year left in this country only a matter of thirty-two million dollars, and I am afraid much less. If manufactured into paper this would have enriched Canada to the extent of approximately one hundred million dollars. This means that we have suffered a direct loss of more than seventy million dollars while the indirect loss has probably been much more. This would reduce our trade balance to a very material extent.

Possibly even more important still, especially in times of unemployment like the present, the additional annual employment of the ten thousand men necessary to turn this million and a quarter cords of wood into paper would mean a city of fifty thousand people, or twenty-five new towns of two thousand population each; although, with the enormous expansion we have had and are now having in the pulp and paper industry, we have but a very short supply for many of our present mills and Canada is already over-developed insofar as pulp and paper are concerned. At least some measure of protection must be afforded to mills already built.

No country, no matter how friendly its relations may be, will consent to the closing of one of its own most important industries for the sake of supplying raw material to the mills of another country.

I quote from a very significant and timely article written by the Hon. Gifford Pinchot, former Chief Forester of the U. S., on "The Economic Significance of Forestry," in "The North American Review" for February:

"* * * * * We are nearly bankrupt, and we do not know it. Because there has always been wood enough to go round, we have placidly assumed that there always would be. Unfortunately, the facts are against us.

"* * * * * We are coming to realize that wood is the most universal of all materials, that without wood all production would be impossible, transportation a dream, and business dead.

"Iron, coal, oil, and wood are the four basic materials upon which civilization rests, and of these the most widely employed and undoubtedly the most indispensable is wood. So far as wood is concerned, the human race is still very much in the same position it has occupied since before the dawn of recorded history. No need of body or mind can be met, no instant of our lives can be passed in comfort or well being, without something that only the forest can supply. Nothing we eat or use or wear can be produced, transported, or consumed without the help of the forest. We never could and cannot now get on without it."

"* * * * Before proceeding to touch upon the actual situation of our timber and timbered lands, it may be well to say a word about wood substitutes. In the first place, the use of a substitute almost invariably means the employment of a less satisfactory material at a higher price. In the second place, the increase of our population and industry more than keeps pace with the development of substitutes, so that, for example, more wood is used in building construction than when all houses were built of wood, more for shipbuilding than when there were no iron ships. The use of substitutes does not decrease consumption of wood in any great line of industry."

"* * * * Can we look to the rest of the world for material help when American forest fail? To our very serious danger, we can not.

"The destruction of our timber, and of the timber producing power of lands valuable for no other purpose, would be far less serious than it is if there were other portions of the world from which the absolutely essential lumber supply for our agriculture and industries could be obtained. From the point of view of the gigantic needs of the United States, "Canada has no great supply of lumber, and has already made it plain beyond per-adventure that she purposes to keep what she has for her own development. * * * * "

Extract from Report on U. S. Senate Resolution 311:

"* * * * For a year or more American manufacturers have been apprehensive concerning the possibility of embargo on all pulp wood exports from Canada. * * "

This time has now arrived. With the tremendous loss in our available wood supply it is now no longer a question for international negotiations but it is simply a question of life or death for our pulp and paper industry.

WASTE PAPER BUYS SPORTING EQUIPMENT.

The number of inquiries reaching the Commission of Conservation indicates an increasing interest in the saving of waste paper. Schools are taking up the work, and, in some cities, a friendly rivalry among the school children has resulted in a much larger quantity being secured.

The schools of Vancouver, B.C., have taken the work up with energy, and, during last season, sold over 60 tons. Great interest is shown by the children in this method of obtaining school funds, and the school teachers agree that the work teaches them thrift. The pupils also compete individually in collecting, but all money earned is pooled in the interest of the school. Baseball, basket-ball, cricket and other athletic equipment is purchased for the use of the pupils, and the possession of these outfits tends to promote inter-school competitions. School skating rinks can also be supported by these earnings.

Apart altogether from the financial returns, the work is one that is of national importance. The demand upon the forests for pulpwood is enormous, and, while the utilization of mixed waste paper for the manufacture of newsprint is not yet commercially feasible, it is being generally used in making building and roofing papers, box-board, etc.

Technical Section Meeting

(Continued from last issue).

INSURANCE OF PULPWOOD.

THE CHAIRMAN: You all know Mr. Hoxey very well, and know the subject upon which he is to speak, and I will not take up your time in further introducing Mr. Hoxey to you. He will discuss the question of "Insurance of Pulpwood" as based on his article on "Protection of Log Piles by Artificial Fog," which appeared recently in the Pulp and Paper Magazine. Mr. Hoxey referred to the principal points in this form of protection and emphasized the point that protection is the best insurance.

MR. BLAIR: Mr. Chairman and gentlemen: There is not very much that I can say in opening this discussion. The only thing is that there might be a tendency, if companies start wetting down their pulp piles, they will form decay in the pulpwood. I am quite sure that will happen, because I am sure that if wood is piled, as ordinarily stored, it will rot very quickly. There are a few pictures to be shown, which show very clearly what happened at some of the American mills. This wood was stored last June; it seemed to be a very high grade of wood; it was carefully piled, and would be in good condition when the mill came to use it, but only five months after the storing, it showed a large development of fungus in the ends of all the sticks. It was impossible to say in what conditions this wood would be after it was used, but only five months after it was stored, in what was supposed to be the best way it could be piled, there was a very pronounced fungus growth.

MR. STADLER: We were trying to find out something about the wetting of the wood with sprays but the nozzles did not actually arrive until very late in the fall, and so our observations have not been very lucid, to say the least.

Furthermore, I think it is very wrong to give information on a subject, the investigation of which has not been carried to a point where we know what we are talking about. To be frank with you, personally, I do not feel that I can tell you anything positively. I have not the figures with me, but I shall send to those interested, the information we do obtain after we have used our equipment, and it may interest some of you to go into that. We intend putting out some information for general distribution within a very few days.

If I am correct, according to my recollection, one of our nozzles will cover thirty feet square. This is of the regular type. We thought this would be the most economical distribution of the moisture without in any way impairing the pulpwood. Now, in that respect, according to observations we made, the percentage of moisture has slightly increased, and I think Mr. Neilson can better tell you what has been done and the difference in the moisture of the wood.

MR. NEILSON: There seems to be an increase on about one per cent. The average for last year was 45.3 per cent.

MR. STADLER. In making the sulphite pulp it is evident that if you have too much water in the wood, the cooking must be longer.

MR. NEILSON: While I have only a few figures here I wish to emphasize what has been said at this and previous meetings. These figures which I have, are not conclusive. We have found that the best results were obtained if we used three-quarter inch pipe and we have two pipes here, one giving eighty gallons per hour, and the other one hundred and twenty gallons, at sixty pounds pressure.

There was approximately a 36 x 36 area sprayed. This has been going on for a short time only, and we have been taking the wood into the mill from the very part of the log pile that has been sprayed.

We, at the Belgo collect chips in almost the same way as we collect coal for testing moisture, we take the chips through a certain period of the day and put them into a container, and bring it into the laboratory, and test them for moisture. Last year and the year before was the first time that we entirely consumed a log pile, so there were no logs left over for this year.

When we usually had a certain part of the log pile left, the moisture would drop down to about thirty-five per cent and the green wood taken direct from the river usually would have a moisture from 44 to 47 or 48 per cent. The moisture collected in the log pile for 1920 was 44.6 per cent, and during April to June, 43.6 per cent. That is the dryest wood. At the end of May the moisture was 43.6 per cent. During June to September there was given wood coming from the river and the moisture was 46.6 per cent. In September to December, from that part of the log pile which had been sprayed, the moisture was 47.6 per cent. It went up one per cent. During 1921 the first part of the month of January, the moisture has been as high as 49 to 50 per cent. We have some days when the moisture was up to 51 per cent. It was a very high percentage of moisture, and the highest we have ever had in our mills since we started the sulphite mill.

Whether this is due to spraying of the log pile or whether because it was left in the river for a long time, it is pretty hard to say.

Making ground wood out of wet wood is all right, but for making sulphite there may possibly be some difficulty. For instance, we generally have a complete digester cycle of somewhere around eight hours, and did so last October, with the same strength of acid, nearly six per cent total acid. Now, for this month of January we could not do the cooking in less than nine hours and twenty minutes. That makes a decrease in our cooking operations of over twenty per cent.

The moisture in the wood, when over fifty per cent, as Mr. Stadler has said, has penetrated into the fibre and that partly explains, to my mind, why the cooking process has been slowed down.

THE CHAIRMAN: I would like to hear of the experiences at Laurentide. Mr. Wardle, I think, you can say something on that.

MR. WARDLE: I am really in the same fix as Mr. Stadler. We have no real data to put forward at this time. We have had some experiences about getting the spaying nozzles that are like his. We got them about a day after we had to shut the water off because the pipes were freezing up. We have the type that has a plunger working on a spring to keep the nozzle clean. It seems to me that for the ordinary mill, taking water from the river, as we do, the water will have more or less chips in it, and I think some sort of a handy cleaner ought to be provided for the spray nozzle, if we want to use the nozzle. We were not able to get

nozzles enough to make any real showing until it was too late to do anything with them.

We had, perhaps, a dozen altogether working days and nights for six weeks before the season got too cold. We kept on through the summer time, as long as any blocks were going on the pile, and we kept a two and one-half inch hose going steadily night and day, whether it rained or not, including Sundays, of course. One of the crews went on the top of the bridge, about one hundred and twenty feet above the ground, and the other crew was down on the ground, and the hose connected with our hydrant out-let, to which was attached about two hundred and fifty feet, or so, of pipe.

About the middle of December we got a letter from Mf. Hoxie and Professor Keay, and had some samples taken from our pile, by the Wood Mill Superintendent. I think there was something like ten or a dozen samples. They averaged about seven or eight inches perhaps in diameter. These blocks were carefully weighed and dried at a constant temperature, and we found we could not detect any difference whatever, although they had been sprayed under the rain and under the hose. I remember in one extreme corner of the pile, some on the top went from twenty-five to thirty per cent, and some of the analyses went up as high as fifty-five per cent. We gave up, with the little data we had, trying to draw any deductions.

We have kept on making a lot of tests, but we want to go about it in a more systematic way before sending out any information whatever.

We need some three hundred and fifty to four hundred nozzles to cover the pile. I base a thousand square feet to the nozzle, or with thirty feet centres, roughly, each way. We are figuring on trying out next some sort of a system for covering the pile absolutely, by means of these spray nozzles, but the trouble we anticipate is the nozzle blocking up and our having to get them cleaned, and on a hundred and twenty foot pile there is no chance of getting at the nozzles. It means the nozzles will have to be uncoupled, and tied with a rope and let down like a swing until they can be reached and cleaned out or renewed.

Apparently the wetting by the hose system was thorough. I do not believe there was any question about it. We could, at any time during the summer, go inside the pile and get a thorough drenching there, showing the water was going through the whole pile from the top to the bottom, and apparently well distributed.

We have never seemed able to keep enough wood in the pile long enough to let the fungus grow on it.

THE CHAIRMAN: Unfortunately for this meeting this whole subject is new, and as been shown by the previous speakers, the data is yet lacking in much detail. I would like to ask Mr. Cooper if he can add anything regarding changes in moisture test to Mr. Neilson's remarks, as given. This is entirely incomplete, but Mr. Cooper may have something to add.

MR. COOPER: We have had practically the same experiences as the others. We have not been able to get enough nozzles to give us any information. When we did get them the water was frozen up. Perhaps next year we will have more information than at the present time. The wood seems to be about the same, containing forty-five per cent moisture out of the pile, and between fifty and fifty-five in the summer time when the wood comes in from the river.

MR. DURGIN: We have done quite a bit of work in the Spanish River Engineering Department on nozzles. The type of nozzle we used last year was not satisfactory on the whole, because the nozzles blocked up. The present is a type which will be installed this year. This is a No. 4 D, made by the Spray Engineering Company, and it gives the best results of any of the group of nozzles which were submitted and which we tested out.

The delivery from these nozzles is 1.2 gallons per minute and the area covered will be 30 x 40 feet. To handle the intake and endeavor to prevent sliming up of the nozzle nose, we will try out cleaning strainers on the intake to the pumps, and the pumps which will be installed will deliver eight hundred gallons and up, and when pushed to the limit, will give us a delivery of about a thousand gallons, which will take care of all the nozzles which will be required.

No data has been gathered of sufficient importance to tell us what the effect has been. The wood does not appear to be any different, and so far as we know at the present time, it is coming out of the pile the same as before, and with no additional difficulty.

Before the end of the year, enough data can be had to intelligently discuss the subject, but until then we have nothing but general information that the service last year was fairly good from a protection standpoint.

MR. HEBBARD asked if the nozzles tried included the Thomas nozzle, patented by Professor C. C. Thomas, of John Hopkins University, at Baltimore, which is adapted to control the cleaning of the nozzles, and was answered in the negative.

MR. KELLOGG: Mr. Chairman, some of you know that for several months this year the News Print Service Bureau made a considerable study of the weighing of pulp wood, moisture contents of wet wood and the yield of pulp from it, and that kind of work is being continued permanently as part of the Bureau's service to news print manufacturers, and one particular thing we investigated was a quick and cheap commercially accurate method of determining moisture in wood. The method which we have developed, consists of making a boring in the stick of wood to be tested, with an automatic drill, and driving out the chips, and using this instead of the disc. That work is not complete as yet, but it has gone far enough to indicate it is sufficiently accurate for a number of purposes, such, perhaps, as made in this case here today, and I am sure the News Print Service Bureau will be very glad indeed to furnish you with a brief statement of that work and the methods developed, and invite your investigation of it further if you care to make one, and if you care for such a brief statement, it can be included in the report of the proceedings.

THE CHAIRMAN: Thank you. very much, Mr Kellogg. We will take that matter up, and I am sure we would like to have that statement. (A report from the committee on the purchase of pulpwood by weight has been published in the Pulp and Paper Magazine).

MR. WARDLE: Mr. Chairman, I am sure, speaking for myself, that Mr. Hoxie is on the right track, and I think he deserves our thanks for the way he has kept after us, and so "more power to his elbow."

THE CHAIRMAN: If there are no further remarks to be made, we will consider that the discussion is concluded, and the Chairman personally wishes to thank Mr. Hoxie very much indeed for coming up here at our request and giving us some further inspiration for this work. It is undoubtedly one of great importance, and will eventually be solved to the benefit of the mills, particularly along insurance lines.

Electrical Association Discusses Paper Machine Drive

An interesting meeting of the St. Maurice Valley branch of the Canadian Electrical Association was held in the Technical High School at Three Rivers on February 23rd. There were nearly seventy in attendance and Mr. Reed of Shawinigan Falls, Chairman of the section, presided.

The first speaker was Mr. F. G. Warburton of the Harland Engineering Company, who first pointed out some of the difficulties with belt drives and then described in considerable detail the operation of the patent speed interlock which is the controlling apparatus and the principal feature of the Harland system of sectional drive for paper machines. In his introduction Mr. Warburton explained in a convincing manner and with photographic proof, that a belt running on cone pulleys must be seriously strained because of the differences in tension at various points across the face of the belt and consequently there is not only a serious effect from friction because of the different surface speed at different points, but actually an attempt for the belt to drive the pulley at one point and to be driven by it at another.

The explanation of the Harland method of controlling absolutely the speed of the motor for each section of the machine was similar to the more complete discussion of this matter at the annual meeting of the Technical Section. This address was published in the Pulp and Paper Magazine for January 20th. It proved, however, a very interesting subject to the engineers in the audience and brought out the very great sensitiveness of the differential gear as a basic factor in the control of motor speeds.

Mr. J. S. Riddile, Manager of the Laurentide Power Company, gave a few details with respect to the manner of controlling the motor speed through the operation of a master shaft whose speed is a definite index of the general paper machine speed desired and whose influence is transmitted to the field of the driving motors through the differential control. He explained how the slight shifting of a belt will immediately alter the speed of a section when it is necessary to change the draw due to a variation in the character of the stock and how the control will then hold the new speed absolutely constant. His explanation was good of the movement of the rheostat contact arm by the intermediate gear of the differential only when there is a divergence of speed from that at which the motor has been set and in such cases moves only enough to correct the tendency of deviation, usually but an infinitesimal amount.

Mr. Riddile described the tuning up process and stated that on the No. 9 machine of the Laurentide Company it took only a little over an hour to determine the proper settings of the regulators and produce a continuous sheet of paper. He explained that any motor can be started and stopped independently and the whole machine can be started and stopped as a unit while any action can be slowly inched along as when inspecting a wire, putting on a felt, etc.

The Westinghouse system of control of the motor for each section was explained by Mr. Staege who came on from Pittsburg. He first discussed the relative advantage in the use of a high speed motor and reducing gear and of the direct connected slow speed motor. It is his opinion that the factors of floor space, efficiency and cost must be considered in each case and the choice made on this basis.

In describing the Westinghouse system, Mr. Staege explained that direct current motors are used throughout and these are driven from a common bus. This bus is supplied with current from an independent generator and the speed of the whole machine can be varied quickly and accurately by a control of the generator voltage. For a small range of speed the common shunt field control is sufficient. For a large range such as 8 or 10 to 1, both shunt field and armature control is advisable. Uniformity of speed is maintained just as well at one speed as at another. The machine speed is altered by push button control operating a small motor-driven rheostat.

The speed of the individual motor on any section is varied by shifting a small belt on cone pulleys and is maintained constant by the operation of a small motor which is compelled to run at a definite frequency always in tune with the master frequency generator, so that any inclination for the motor to change speed will affect the frequency of the control and this will cause the change in the field current of the section motor, bringing it immediately back to the required speed — in fact operating so quickly that the motor does not have a chance to get out of step with the others on the machine.

The General Electric Company and the Canadian General Electric Company were represented by Mr. W. W. Cronkhite of Shenectady. He remarked that after hearing the other speakers he wondered how paper had ever been made at all without the sectionalized drive. He reviewed briefly, the manner of his company developing this type of drive and remarked that all the equipment was taken directly out of regular stock. A number of these drives are already in operation, the first one being the news machine of the Crown Willamette Company which is now running at 920 feet, and a book machine of the Kimberly-Clark Company which has a variation of from 100 to 600 feet of paper or a motor speed of 15 to 75 R.P.M. This type of drive used direct current motors obtained by reversing a regular engine driving generator. They are brought up to speed individually by the operation of a drum controller like that used on a street car and Mr. Cronkhite remarked that if the general type of motor-man could handle such pieces of apparatus, surely an intelligent machine tender should have no difficulty with it. He pointed out that it has not been possible, and probably will not be possible, to eliminate a cone drive somewhere for the changing of the draw between sections. In the General Electric system of control cones are used and small synchronous motors are used to take up and transfer any variation in load on any section electrically throughout the driving system so that instantaneously the machine continues to run at the speed for which each part is set. For instance, if the weights are lifted from the second press this section would have a tendency to run faster, but immediate-

ly the synchronous motor becomes a generator and acts as a brake on the second press driving the motor and send the current so produced into all the other synchronous motors, each of which feeds power to the driving motor with which it is connected. A variation in load of 7 per cent is the greatest change that has been observed on the news machine referred to.

Mr. Cronkhite humorously referred to the machine tender who objected to the electric drive because if the steam engine got out of order he could climb in and fix it but he would be darned if he was going to be electrocuted fixing electric apparatus. Another incident which caused great amusement happened in connection with the Crown Willamette machine. While tuning it up one of the men who was sweeping about noticed some dirt on a calender roll and attempted to sweep it off. His broom was immediately jerked out of his hand and drawn in between the rolls. A G. E. man happened to be standing at the controller and immediately slowed down and reversed the calender. The broom shot out at the workman so quickly that he was scared and betook himself to other parts without waiting to pick up his broom.

It may be remarked in this connection that the new machines of the Laurentide Company and of the Interlake Tissue Mills are being driven by sectional drives controlled by the Harland system while the new machine at the Ontario Paper Company will have a General Electric control and the new 158'' machine at the Abitibi Company will have Westinghouse drive.

After the meeting, which had lasted from four until nearly seven, the party dined together and the members from Shawinigan and Grand'Mere left at eight o'clock while the others from out of town returned to Montreal on the night train.

PROPOSE A TARIFF ON PULP.

The preparation for hearings before the Ways and Means Committee of the House of Representatives on the tariff on paper has aroused much interest among manufacturers of paper in the country, not only as to tariff on various kinds of paper, but as to the pulp situation, says a letter from Secretary Baker of the American Paper & Pulp Association.

There seems to be some misunderstanding as to the amount of pulp produced in this country as compared with the amount of pulp brought in from Canada and Europe. Definite facts are the only sound basis for conclusion as to future supplies of pulp for the paper industry of the United States.

	MECHANICAL		CHEMICAL			
YEAR	MADE	IMPT'D	MADE	IMPT'D	MADE.	IMPT'D
1899	586374	-	593151	-	1179525	-
1904	968976	-	952792	-	1921768	-
1907	-	-	-	-	2547879	-
1908	-	-	-	-	2118947	-
1909	1179266	142989	1316257	224661	2495523	367650
1910	-	226189	-	278926	2533976	505115
1911	-	267089	-	299330	2686134	566419
1912	-	185802	-	354346	-	540148
1913	-	170493	-	373566	-	544059
1914	1293661	217580	1571896	458154	2893160	675734
1915	-	178535	-	382801	-	561336
1916	1508139	262618	1926862	421165	3435001	683778
1917	1535953	279071	1973986	398369	3509939	677440
1918	1364504	185527	1949357	392691	3313861	578218
1919	1449799	202612	1934969	433807	3384768	636419
1920 Est.	1550000	200000	2250000	550000	3800000	750000

The Secretary of the Pulp Manufacturers Association, Mr. H. H. Bishop, was asked to prepare a statement on the amounts of mechanical and chemical pulp manufactured in the United States and imported from other countries. The following paragraphs are taken from the letter addressed to this Association by Mr. Bishop.

''As requested by you, I give below a statement of the amounts of mechanical and chemical pulp manufactured in the United States and imported from other countries.

As a further matter of interest, we have calculated the percentage of Production and Importations so fa as it is possible from the above table from which you will note that the percentages while they have varied slightly from year to year, are reasonably consistent and indicate that about 1/6 of the pulp used in the United States come from outside sources.

PERCENTAGES OF PRODUCTION AND IMPORTATIONS OF PULP USED IN THE UNITED STATES

	MECHANICAL		CHEMICAL		TOTAL	
YEARS	MADE	IMPT'D	MADE	IMPT'D	MADE	IMPT'D
1909	89.2	10.8	85.4	14.6	87.1	12.9
1914	85.6	14.4	77.5	22.5	81.1	18.9
1916	85.	15.	82.	18.	83.4	16.6
1917	84.6	15.4	83.2	16.8	85.1	14.9
1918	88.	12.	83.2	16.8	85.1	14.9
1919	87.7	12.3	81.7	18.3	84.2	15.8
1920	88.6	11.4	80.4	19.6	83.5	16.5

Your attention is particularly invited to the very great increase both in manufacture and in import of pulp during the year 1920, when the entire Paper Industry was enjoying an abnormally large business. The fact that the United States produced in the year 1920, under these favorable circumstances, 3,800,000 tons of pulp, of all kinds, and that the consumption of pulp during the years 1918 and 1919 (reasonably normal years) averaged 3,850,000 tons, it became self evident that the United States actually possesses sufficient pulp making capacity to very nearly meet its requirements in normal years and that with very little encouragement production might be increased to a point where it could supply the entire demand and have a surplus. It is with a view of obtaining this encouragement that we are asking for a revision of the existing tariff, which places pulp upon the free list, so that duties be imposed as follows:

Mechanical Pulp.. .. .. 1/10 of 1c. per lb.
Unbleached Chemical Pulp .. .. 2/10 " " " "
Bleached Chemical Pulp .. .. .. 3/10 " " " "

The effect of the imposition of such duties would, in our opinion, be to encourage further production of pulp in the United States for the reason that United States manufacturers would then be upon a more nearly equal basis with Canadian and Scandinavian manufacturers, whose advantage from both the standpoint of raw material and labor is certainly greater than the small duty suggested.''

A printed brief, prepared by the Tariff Committee of the American Paper and Pulp Association, has been sent to every member of the Association. This brief will give a more comprehensive statement as to the Pulp situation in the United States.

The Toronto Paper Mfg. Co. whose mills at Cornwall have been operated for some time by the Howard Smith Paper Mills, Ltd, has now been fully absorbed by the latter. From now on, shipments are to be billed to Howard Smith Paper Mills, Ltd., Cornwall, Ontario, and invoices and other communications addressed to the head office, 138 McGill St., Montreal.

PULP EXPORTS DECREASED IN JANUARY.

Canadian exports of pulp and paper for the month of January were valued at $9,663,054, compared with $9,151,266 in January 1920, a gain of $511,788. There was a gain of $1,969.440 in the value of paper exports, a loss of $881,214 in the value of chemical pulp exported, as shown in the following table:

January	1920	1921	Gain or Loss
Paper	$5,519,718	$7,489,158	$1,969,440
Chem. Pulp	2,658,974	1,777,760	881,214 #
Mech. Pulp	972,574	396,136	576,438 #
Totals	$9,151,266	$9,663,054	$ 511,788

Loss.

The export of paper included 7,703 cwts. of book paper, valued at $109,205; 1,146,831 cwts. of newsprint valued at $6,532,034, and other paper to the value of $847,919. There was a decrease of 5,677 cwts. in volume and an increase of $2,060,235 in value of the newsprint exported as compared with January 1920.

Pulp exports included 83,722 cwts. of sulphate (kraft) valued at $426,827; 74,125 cwts. of bleached sulphite, valued at $526,839; 143,299 cwts. of unbleached sulphite, valued at $824,094, and 133,951 cwts. of groundwood, valued at $396,136.

The countries of destination were: Paper: United Kingdom, $210,105; United States, $6,167,547; other

EXPORTS OF PAPER, WOOD PULP AND PULP WOOD.

January, 1920 and 1921; and ten months ending January, 1919, 1920 and 1921.

Paper		Month of January		Ten months ended January		
Printing paper		1920	1921	1919	1920	1921
Book paper	Cwt.	4,646	7,703	.....	41,184	54,806
	$	43,490	109,205	.....	376,853	634,356
Newsprint paper	Cwt.	1,152,508	1,146,831	.....	11,579,711	12,540,412
	$	4,471,799	6,532,034	.....	41,727,089	63,503,757
Printing paper	Cwt.	.....	.....	10,652,228	.....	.....
	$	.....	.....	31,822,722	.....	.....
Other paper	$	1.004,429	847,919	5,276,441	7,613,882	11,039,742
Total paper	$	5,519,718	7,489,158	37,099,163	49,717,824	75,177,855
Wood Pulp						
Sulphate (Kraft)	Cwt.	195,650	83,722	.....	2,078.330	2,111,309
	$	618,888	426,827	.....	6,805,903	11,092,257
Sulphite, bleached	Cwt.	112,285	74,125	.....	965,094	1,718.966
	$	599,030	526,839	.....	4,896,472	13,758,055
Sulphite, unbleached	Cwt.	364,499	143,299	.....	3,394.232	4,516,965
	$	1,441,056	824,094	.....	14,807,251	26,587,209
Chemically prepared	Cwt.	.....	.....	7,302,633	.....	.....
	$	.....	.....	26,268,144	.....	.....
Mechanically ground	Cwt.	609,206	133,951	3,174,602	6,231,722	5,055,710
	$	972,574	396,136	4,035,940	7,348,728	15,963,677
Total wood pulp	Cwt.	1.281,640	435,097	10,477,235	13,239,378	13,402,950
	$	3,631,548	2,173,896	30,304,084	33,858,354	67,401,198
Pulp wood	Cord.	59,789	155,752	1,303,370	738,477	1,243,112
	$	615,181	2,271,363	12,567,353	7,417,390	16,396,940
Country of Destination						
Paper and manufactures of—						
To United Kingdom	$	401,467	210,105	782,440	3,752,366	3,621,882
United States	$	4,409,907	6,167.547	30,811,721	39,667,928	58,780,513
Other Countries	$	708,344	1,111,506	5,505,002	6,297,530	12,775,460
Wood pulp—						
To United Kingdom	$	149,922	.....	48,522	4.299,477	7,678,274
United States	$	3,045.013	1,865,372	27,713,523	25,664,347	54,801,216
Other Countries	$	436,613	308.524	2,542,039	3,894,530	4,921,708
Pulp wood—						
To United Kingdom	$	.....	.....	.....	.....	.....
United States	$	615,181	2,271,363	12,567,357	7,417,390	16,396,940
Other Countries	$	.....	.....	.....	.....	.....
Total paper, wood pulp and pulp wood						
To United Kingdom	$	551,389	210,105	830,962	8,051,843	11,300,156
United States	$	8,070,101	10,304,282	71.092,601	72,749,665	129,978,669
Other Countries	$	1,144,957	1,420,030	8,047,041	10,192,060	17,697,168
Totals	$	9,766,447	11,934,417	79,970,604	90,993,568	158,975,993

countries, $1,111,506. Pulp: United States, $1,865,372; other countries, $308,524.

Unmanufactured pulpwood to the amount of 155,752 cords, valued at $2,271,363, was exported to the United States in January, compared with 59,789 cords, valued at $615,181, in January, 1920.

For the first ten months of the current fiscal year, April to January inclusive, pulp and paper exports reached a value of $142,579,053, compared with $83,576,178 in the corresponding period of 1920, and with $67,403,247 in 1919, a gain of $59,002,875 over 1920, and of $75,175,806 over 1919. They were made up as follows:

Ten months	1919	1920	1921
Paper	$37,099,163	$49,717,824	$75,177,855
Chem. Pulp	26,268,144	26,509,626	51,437,521
Mech. Pulp	4,035,940	7,348,728	15,963,677
Total	$67,403,247	$83,576.178	$142,579,053

Exports of unmanufactured pulpwood for the 10 months were 1.243,112 cords, valued at $16,396,940, compared with 738,477 cords, valued at $7,417,390, for the corresponding months ending January 1920, and 1,303,370 cords, valued at $12,567,357, ending January 1919, all of which went to the United States.

STATISTICS OF THE U. S. PAPER INDUSTRY IN 1920.

The Federal Trade Commission has just issued a very complete tabular summary of the pulp and paper industry in the United States for 1920. The following tables are quoted from this report. The increases in production of the principal grades during 1920 as compared with 1919 are as follows:

Total Newsprint, 10 p.c.; Standard News, 12 p.c.; Book, 27 p.c.; Total Paperboard, 18 p.c.; Boxboard,*; Wrapping, 20 p.c.; Bag, 21 p.c.; Fine, 13 p.c.; Tissue, 14 p.c.; Hanging, 24 p.c.; Felt and Building, 30 p.c.; Other Grades, 50 p.c.. Total for all grades, 18 per cent.

*Figures for "Boxboard" prior to March, 1920, were included under "Total Paperboard."

Domestic production of pulp, by grades in the United States of America, 1917-1920 inclusive, in tons, was:

Ground Woodpulp, production for year—1917, 1,447,068; 1817, 1,303,403; 1919, 1,449,799; 1920, 1,578,300.

Sulphite, News Grade.—1917, 744,470; 1918, 744,944; 1919, 723,991; 1920, 843,514.

Sulphite, Bleached.—1917, 497,085; 1918, 484,525; 1919, 515,897; 1920, 578,081.

Sulphite, Easy Bleached.—1917, 85,081; 1918, 80,730; 1919, 66,465; 1920, 72,394.

Sulphite Mitscherlich.—1917, 78,751; 1918, 74,799; 1919, 79, 353; 1920, 82,687.

Sulphate Pulp.—1917, 108,431; 1918, 167,438; 1919, 161,887; 1920, 212, 888.

Soda Pulp.—1917,398,684; 1918, 343,611; 1919, 377,473; 1920, 431,971.

Other than Wood Pulp.—1917, 11,999; 1918, 12,898; 1919, 9,903; 1920, 7,821.

Total for all Grades.—1917, 3,371,569; 1918, 3,212,398; 1919, 3,384,768; 1920, 3,807,656.

Increases in the production of pulp by grades, during 1920 as compared with 1919, was as follows:—

Ground Wood Pulp, 9 p.c.; Sulphite, News Grade, 17 p.c.; Sulphite, Bleached, 12 p.c.; Sulphite, Easy Bleach, 9 p.c.; Sulphite, Mitscherlich, 4 p.c.; Sulphate Pulp, 31 p.c.; Soda Pulp, 14 p.c.; Other Grades *21 p.c. Total for all grades: 12 p.c. *Decrease.

The Publicity Club of Springfield has announced the appointment of Mr. J. A. Priest as General Chairman of the local committees in charge of the 1921 Direct Mail Advertising Association Convention. Mr. Priest has already announced the appointment of Mr. Edmund E. Keough, of the American Writing Paper Company, as chairman of the Magazine and Advertising Club Publicity Committee.

Careless and failure are twins.—B. C. Forbes.

IMPORTS AND EXPORTS OF ALL GRADES OF PAPER, (POUNDS AND VALUE) AND IMPORTS AND EXPORTS OF ALL GRADES OF PULP, (NET TONS), 1917 TO 1920, inclusive. (a)

PAPER

	1920		1919		1918		1917	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
Imports								
Newsprint	1,459,737,288	$68,600,950	1,255,462,866	$43,674,094	1,192,540,059	$35,023,161	1,118,225,912	$30,929,628
Book Paper	4,340,425	496,132	164,886	58,319	182,995	42,633	412,091	67,931
Wrapping	4,941,824	460,289	4,802,487	406,570	7,942,134	541,866	6,661,518	456,752
Hanging	---	353,791	---	104,326	---	143,449	---	281,906
All other grades (b)	---	2,741,238	---	1,638,711	---	2,541,157	---	4,144,426
Exports								
Newsprint	91,951,913	5,983,611	220,589,829	10,100,229	193,477,853	7,978,296	187,732,739	7,586,374
Book Paper	95,689,512	13,765,694	153,327,185	16,160,777	99,220,241	8,710,940	94,548,586	8,179,868
Paperboard	---	5,553,094	---	4,604,948	---	3,055,255	---	2,232,135
Wrapping	61,264,501	6,994,381	74,916,830	6,664,462	59,899,043	4,828,856	52,485,911	3,987,239
Bag	---	2,593,459	---	1,566,373	---	884,415	---	1,136,272
Fine	---	8,908,230	---	13,188,165	---	6,113,498	---	3,636,235
Tissue	---	2,654,529	---	2,237,570	---	1,526,777	---	480,289(c)
Hanging	---	1,251,743	---	899,457	---	529,539	---	465,814
All other grades (b)	---	11,091,952	---	8,799,550	---	6,170,601	---	5,374,707
TOTAL IMPORTS	---	72,652,400	---	45,882,020	---	38,292,266	---	35,880,643
TOTAL EXPORTS	---	58,796,693	---	64,220,631	---	39,798,177	---	33,078,933

PULP

Imports	1920 Net Tons	1919 Net tons	1918 Net Tons	1917 Net Tons	Exports	1920 Net Tons	1919 Net Tons	1918 Net Tons	1917 Net Tons
Chemical Wood Pulp									
Bleached Sulphite	128,206	42,755	16,757	41,037	Domestic Wood Pulp	32,133	40,095	22,324	39,180
Unbleached Sulphite	344,969	239,952	253,454	248,173					
Bleached Sulphate	17,277	5,145	3,759	1,625					
Unbleached Sulphate	182,697	145,911	118,761	107,933	Rags and Other Materials made from Vegetable Fibres	42,282	27,271	16,121	16,312
Ground Wood Pulp	233,148	202,253	185,478	279,073					
Paper Stock other than wood pulp	254,755	110,195	29,397	20,977(d)					
TOTAL	1,161,052	746,211	607,606	698,818	TOTAL	74,415	67,366	38,445	55,492

(a) Data furnished by the Department of Commerce. Figures for Pulp given in long tons and reduced to net tons by the Commission.

(b) Includes some paper already converted into commercial articles.

(c) Last six months only. First six months included in other grades.

(d) Rags only.

British Trade News

(From our London Correspondent.)

London, Feb. 14, 1921

The news has reached London that the Titaghur Paper Mill, in India, will be extended to the erection of a bamboo pulp mill. It will be run by an auxiliary company. Recently the Titaghur Paper Mill Co. Ltd. paid a dividend for the half year of 25 Rupees per 100 Rupees ordinary share, which is considered satisfactory. The mill, however, has many difficulties in the way of railroad and transport for conveying raw materials.

Paper Mills Closed; Others Busy.

If anybody wants to find out what things are like in a paper mill today they have only to study the labor market. It is like a barometer. Present reports state that unemployment among paper mill workers in the United Kingdom is on the increase and agents, as well as mill owners, say that business is very dull all round and stocks are keeping up. There is a divergence of opinion, however, as to the outlook. Some people look on it as gloomy; others say a good time is coming as buyers will sooner or later find their supplies exhausted. But the fact remains that unemployment is not decreasing and it may be taken as a sign of the times. Indeed, if it was not for the small amount of business moving on export account with British colonies and dependencies things would be very critical. But the dullness of trade has, in some cases, influenced mill owners to close down and carry out repairs to their machinery and buildings, but this is not so in all cases. An indication of the state of trade in East Lancashire is furnished by the intimation that three mills at Darwen are closed down and a similar story comes from other parts of England. Kent, the centre of hand made paper, mostly for Government purposes, is in a happier position. The mills at St. Mary Cray and St. Paul's Cray, places only a short run from London, are working full capacity. They have enjoyed a lengthened period of prosperity and it is gratifying to record that there is at least one section of the paper industry that does not feel the present pinch of depression. Looking round generally it stands to reason that the present depression cannot go on much longer and there is one ray of hope in this direction by the removal of the Excess Profits Duty by the Government. It was a most notorious millstone hanging round the necks of paper mill owners and crippled trade, not to speak of the expansion of business or schemes, in all directions. The removal of this bugbear may brighten things up for the near future and create a better feeling in the markets. To give Canadians an idea of what taxation is like in the United Kingdom, one small mill has to set aside £100,000. It takes a lot of paper to be sold to make up this amount before the management begins to think of profits—and profits are not easily picked up in a keen competitive market with foreign competition on all sides. Yet is it done, as past dividends show!

The Pulp Situation.

The market for chemical pulps continues dull and depressed and contracts entered into are undergoing revision. The groundwood market is in a similar plight. Naturally the slump in the paper industry is keenly reflected in pulps. Quotations are about as follows:—

Bleached Sulphite	£55
Easy Bleaching	42
Sulphite News (No. 1)	37.5
Unbleached Soda	37.10
Soda Kraft	33
Groundwood (50 p.c. wet)	10
Groundwood (dry)	20

These are F.O.B. prices, with freights and insurances, c. i. f. United Kingdom ports.

Canada In The Limelight.

In my last notes I commented on the dilatory classification of imports into the United Kingdom by the Customs. The new year, however, has opened with an improvement and for the first time in the monthly returns Canada figures in the limelight shining on newsprint imports. In the past one had to wait a year for the figures or go to Canada for them. Now we are in a position, month by month, to see what the Dominion is doing in relation to Scandinavia and other places and the comparison for January imports of newsprint are interesting as the following figures given by the Board of Trade show:—

	Average for January.		
	1921. Cwts.	Value 1921. £	1920. Cwts.
Sweden	16,940	2.17.7	37,200
Norway	22,080	2.13.6	45,600
Germany	11,000	2.16.8	400
Belgium	1,400	3.10.10	480
U. S. A.	2,600	4 . 5.4	3,900
Canada	4,920	2.18.5	11,700
Newfoundland	.....	.....	.....
Other places	33,460	2.10.9	35,960

On glancing at the average value, based on the returns, it will be seen that Canada is not much above Scandinavia. It is, however, regrettable to notice such a falling off in the shipments, but the ratio is not so great as that of Scandinavia as a whole.

Wrapping Papers.

Canada also appears in the figures for wrapping papers and it will be seen that there is room for improvement in the British market. The imports for January were:

Finland	5,810	cwts.	£16,194
Sweden	23,034	"	73,833
Norway	18,768	"	67,497
Germany	21,711	"	70,012
Belgium	6,844	"	25,639
Canada	5,682	"	14,322
Other places	18,805	"	62,225

Other imports from the Dominion during January include millboards, card and paste boards.

Pulp Imports.

The imports of groundwood into the United Kingdom reached 28,153 tons, valued at £386,807, as against 23,300 tons in January 1920, valued at £205,878, and 42,130 tons at £98,779 in 1913. Canada and Norway were the principal supplying countries as the following imports show:—

	1921.		1920.	
	Tons.	£	Tons.	£
Sweden	280	3,254	2,875	28,238
Norway	24,943	348,566	20,208	175,722
Canada	2,930	34,987	.....	.....
Other places	.....	.....	217	1,918

These figures show a material rise in Canadian exports of ground wood (wet).

The imports of chemical pulps were as follows in January:

	Bleached Chemical Dry.	Unbleached Chemical Dry.
Finland Tons	—	101
Sweden "	99	12,034

Norway	1,471	3,291
Germany	138	508
Canada & other places	126	537

The total supplies of all kinds of chemical pulps into the British market during January, compared with the corresponding period in 1920, were as follows:—

	1920.	1921
Bleached chemical (Dry)	3,755 Tons.	1,834 Tons.
Unbleached (Dry)	63,637 "	16,471 "
Chemical wet	160 "	40 "
Groundwood (Wet)	23,300 "	28,153 "
" (Dry)	3,168 "	567 "
Total	94,020 "	47,065 "

The totals show a reduction in the imports of all kinds of pulp during January. A significant feature is the German supply of sulphite, bleached and unbleached, that is coming into the country, and it will be noticed that the figures are gradually creeping up to those of pre-war times.

Looking back at the supplies of pulps for the past three months the figures are:—

	Chemical.	Groundwood.
November, 1920	49,000 Tons.	31,000 Tons.
December, 1920	47,000 "	42,000 "
January, 1921	18,350 "	28,850 "

British Exports.

The exports of British paper and cardboard in January, compared with the corresponding period in 1920 and 1913, are as follows:—

1921	221,467 cwts.	£1,417,784
1920	158,419 "	656,864
1913	322,931 "	334,844

Considering the dullness in trade these figures for January last are not at all bad and a noticeable feature is the falling off in the exports to Canada as the following return shows:—

	Printings. Cwts.	Writings. Cwts.	Other kinds. Cwts.
France	3,144	266	57
U. S. A.	1,096	25	696
Other Foreign places	23,801	4,616	2,383
British South Africa	16,390	2,016	425
British India	17,526	3,739	759
Straits Settlements	1,089	785	—
Ceylon	1,844	344	—
Australia	48,860	7,367	1,141
New Zealand	9,384	2,094	278
Canada	439	—	165
Other places	6,727	1,253	—

BROMPTON'S DIVIDEND.

Reports to the effect that new financing might necessitate the Brompton Pulp and Paper Company passing its next dividend were brought to the attention of F. N. McCrea, M.P., president of the company last week.

"Up to six weeks ago, we were doing a very large business at a fair profit," he said. "Since then we have, like other paper companies, been somewhat affected by the depression in our trade.

"We paid our last dividend and the next is not due for some months. I cannot forecast what business will be. We have ample assets and securities. It is all a question of the volume and profit of future business."

BOOK REVIEW.

PAPER AND ITS CONSTITUENTS.—A Manual of Technical Methods. Chemistry and analysis of raw materials; papermaking fibers; bleaching, sizing and loading agents and dyestuffs, microscopy; and physical and chemical properties of papers. By Henry Aldous Bromley, H. M. Stationery Office. vii + 232 pp. 4 plates. 8 vo. London: E. and F. N. Spon, Ltd.; New York, Spon and Chamberlain, 1920. 15s. net.

The greater part of the matter in this book originally appeared as a series of articles in the pages of the "Paper Maker" from February, 1914 onwards. The material has now been revised and rearranged, and every effort made, according to the author, to include the most up-to-date aspects of the subject within the limits of its scope. The book is intended both as a work of reference and as a manual for the use of students preparing for technological examinations.

The first 20 pages deal with the occurrence, chemical characteristics and reactions of cellulose and give a short description of the commoner fibers employed in the manufacture of paper.

The second part (pages 21-140) deals with general chemistry for papermakers, and the chemistry of the various materials used in papermaking, such as bleaching agents, sizes, mineral filling, loading agents, pigments and dyes, and water. It also attempts to give methods of analysis of the various substances. These chapters are well written for the general reader, but are too condensed to be of value as a reference work. Methods of analysis, especially, should be detailed to be useful to the laboratory or mill operative. The chapter on general chemistry is such that it would need supplementing from an elementary textbook on chemistry before the reader would be in a position to do the simplest laboratory experiment.

The third part describes the methods of examining paper with reference to their microscopical, physical and chemical properties. This section is by far the most valuable, and will doubtless prove of considerable service to those engaged in the paper industries.—Reviewed for the Pulp and Paper Magazine, by Clarence Jay West.

Sincere congratulations to Dominion Engineering Works, Harland Engineering Co. and the paper mills they have been serving. The former has accomplished a big job in having three machines started all within two months and with two more to begin operations within the current month. Four of them are equipped with the Harland sectional electric drive. Laurentide's second "acme of paper machines" started making paper at 700 feet; Interlake's tissue machine is turning out the universal product, and Howard Smith's and Strathcona's machines will soon be turning out writings and boards. This takes in about the whole range of paper-making and the successful accomplishment of such installations is a record for the Canadian industry to be proud of. It reflects credit alike on the paper mill and the machinery men.

The reward of a thing well done is to have done it. — Emerson.

Technical Section

ABSTRACTS OF PATENT SPECIFICATIONS.

A-12. Purification of partly oxidized resins. U. S. patent No. 1,316,842 JOHN R. KOHLER, Stockholm, Sweden, Sept. 23, 1919. Chem. Met. Eng., **22,** 89, (Jan. 14, 1920). Old resins which flows spontaneously from confiers or from wounds of tapped trees consist of a mixture of oxidised resins acids and crystallized resin acids both constituents being sol, in EtOH. Solvents such as C_6H_6 and oil of turpentine dissolve only the valuable crystallizable resin acids, which may be recovered as light-colored colophony of high quality.—A. P.-C.

D-2. Recovery of organic products from wood. U. S. patent No. 1,339,489, H. F. WEISS, Assignor to C. F. Burgess Laboratories, May 11, 1920. J. Soc. Chem. Ind., **39,** 482A, (July 15, 1920). Wood is ground in a current of water which serves to carry away the pulp; the water is separated from the pulp and used again, this cycle of operation being repeated until the concentration of the organic products in the water is sufficient for the subsequent recovery process.—A. P.-C.

E-2. Improved sulphur dyes from sulphite waste liquors. U. S. patent No. 1,316,742, JACOB S. ROBESON, Pennington, N.J., U.S.A., Sept. 23, 1919. Chem. Met. Eng., **22,** 138, (Jan. 21 1920). S dyes obtained from sulphite waste liquor are improved be converting the Ca ligno-sulphonate into the corresponding salt of a heavy metal base; e.g. Fe (brownish black), Al (red brown), Cu (seal brown), Zn, (gray brown), etc. —A. P.-C.

E-2; F-2. Active discolorizing carbon from cellulosic materials. Ger. patent No. 309,155, Zellstoff-fabrik Waldhof, June 22, 1917. J. Soc. Chem. Ind., **39,** 479A, (July 15, 1920). A decolorizing C with a greater efficiency than wood or animal charcoal is obtained by carbonising the residues derived from the hydrolysis of cellulose or cellulosic materials.—A. P.-C.

E-4. Process for regulating the acidity of sulphite liquor. U. S. patent No. 1,340,649, J. B. CRANDON, Assignor to Crandon Mfg. Co., May 18, 1920. J. Soc. Chem. Ind., **39,** 483A, (July 15, 1920). The liquor is caused to form the electrolyte of an electric battery and the current produced measured.—A. P.-C.

K-12. Paper making machine. U. S. patent No. 1,343,505, ANTON J. HAUG, Assignor to Improved Paper Machinery Co., Nashua, N.H., U.S.A. Claims allowed 37. Paper, **24,** (July 14, 1920). In a paper making machine, the combination with a pulp tank and a rotary screen therein, of an overflow tank for the screened white water, and normally closed means for discharging the pulp residue of the tank at will to the white water chamber.—A. P.-C.

K-12. Improved process for watermaking paper. Fr patent No. 496,612, Kansas Pappersbruks Aktiabolag, Finland. Paper 24, (Aug. 1920). See Pulp and Paper, **18,** 439, K-12, Apr. 22, 1920.—A. P.-C.

K-18. Method and machine for handling plaster board. U. S. patent No. 1,342,185, O. L. ROUTT, G. C. McCONNELL, and H. GLAZE, Assignors to Plastoid Products, Inc., Los Angeles, Cal., U.S.A. Paper, 24, (Aug. 4, 1920). Means for handling plaster board which consists of an inclined railway, carrier to receive said paster board adapted to move along said runway under the place of discharge of said plaster board, the latter holding the carriers to a movement corresponding to the feed speed of said plasterboard. Claims allowed 6.—A. P.-C.

K-18. Strawboard lining for cyanamide furnaces. U. S. patent No. 1,315,678, WM. H. MIDDLETON, Niagara Falls, Ont., Assignor to American Cyanamide Co., Sept. 9, 1919. Chem. Met. Eng., **22,** 89, (Jan. 14, 1920). By merely lining a cyanamide furnace with corrugated strawboard a given oven will hold 35 per cent more carbide than when a paper sleeve is used, and 50 per cent more than when a metal container is used. The usual cylinder around the resister is provided and, in addition, tubes of corrugated strawboard extend from the N inlet to the resister space so that effective distribution of the N is obtained.—A. P.-C.

K-20. Process for the manufacture of parchment paper. Eng. patent No. 123,594, W. DAGNALL, England. Chimie et Industrie, **4,** 814, (June 1920). (Same as Fr. patent No. 495,742.) The paper is rendered water and acid-proof and its strength is greatly increased by passing through two baths of H_2O_4 mixed with H_2SO_3, the second being the more dil. of the two. The acid is pressed out of the paper as it comes out of each bath, and neutralized in an alkaline bath. It is then washed and then treated in a bath contg. glycerine, chloride of lime, salt or an analogous product, with or without the addition of loading material, and finally dried.—A. P.-C.

K-21. Pulp for the manufacture of roofing felts. Eng. patent No. 135,466, R. KRON, Oct. 2, 1919. Same as Fr. patent No. 493,387. See Pulp and Paper, **18,** 58, K-6, K-21, (Jan. 15, 1920). A. P.-C.

K-23. Combustible paper Eng. patent No. 124,516, C. R. HARRISON and W. BACON, England. Chimie et Industrie, **4,** 814, (June 1920). A considerable proportion of nitrocellulose, or the like, is added to the pulp, and the paper is finished in the usual manner. After sizing, insol Ca or Mg salts (e.g., $CaCO_3$ or $MgCO_3$) are added, and the paper may be impregnated with a solution of a metallic nitrate, e.g., $NaNO_3$.

K-23. Waterproof paper. Eng. patent No. 124,689, K. KONAGAL, Japan. Chimie et Industrie, **4,** 814 (June 1920). The paper is immersed in a gelatin solution, which coagulated by means of a solution of a mixture chrome and ammonia alums. It is then coated by means of the following mixture: castor oil, ceruse, ZnO, linseed oil, with or without the addition of infusorial earth. Each mixture, may be diluted with turpentine. Finally, a final coating may be given with a rubber solution.—A. P.-C.

L-7. Dyeing threads and paper textiles by means of substantive dyes. Ger. patent No. 310,965, Chemische Fabrik Coswig-Anhalt. Ges. m.b. H., Germany. Chimie et Industrie, **4,** 492, (April 1920). The exhaustion of the bath may be obtained by the addition of boric or acetic acids or NH_4 salts of phosphoric acid. They may be added either at the beginning of the dyeing operation, before heating, or during the boiling. All substantive colors may be used.—A. P.-C.

UNITED STATES NOTES

Manufacturers of paper from upper New York State and delegates representing the International Brotherhood of Paper Makers, met last Thursday and Friday, in the Murray Hill Hotel, New York City, for conferences regarding the scale of wages at the expiration of the present schedule, May 1, 1921. Officials of the St. Regis Paper Company, the Union Bag and Paper Company, the Sherman Paper Company and the Remington Paper Company, were present; and the paper workers were represented by J. T. Carey, president of the international union, and John Burke, president of the Pulp and Sulphite Workers' Union. Officially the meetings were said to have been routine, in accordance with contracts between manufacturers and the union of their employees, which require that a notice of proposed alterations be given sixty days before the expiration of existing agreements. Unofficially it was reported that the workers had demanded a wage increase ranging from 5 to 10 per cent. Unemployment insurance also was recommended. The manufacturers will meet about the middle of this month to consider the proposals.

New bids for contracts to supply paper to the Government Printing Office were entered last week before the Joint Congressional Committee on Printing. The number of representative paper concerns bidding exceeded the number making the original proposals in January. The prices quoted showed a decided drop from those submitted in the rejected bids of a month ago. As a typical instance, the price on about 4,000,000 pounds of writing paper shows a decrease since Jan. 31 of from 3 to 4 cents a pound. Book paper is down 1 cent, and newsprint paper, which was quoted at 6.28 cents delivered on January 31, is now quoted at 5.48 cents delivered. It is estimated that if the committee offers the contracts on the basis of the figures submitted, it will have saved the Government $300,000 as a result of the rejection of all bids several weeks ago.

Consul W. H. Sholes at Goteborg, Sweden, reports that 165,000 tons of newsprint paper was manufactured in Sweden in 1920. The figures he quotes are given out by the Swedish Association of Paper Mills. For 1921 the total Swedish newsprint production is expected to reach about 175,000 tons. The exports during the period January to November, 1920, amounted to a total of 105,919 tons and will probably reach 120,000 tons for the year, compared with 66,066 tons in 1919.

Officials of the Kimberley-Clark and Neenah Paper Companies, Wisconsin, are greatly pleased over the result of the appeal made to the workers in its plant for increased production. The records made by the Kimberley and Niagara mills during January show an average daily production of 146 17/100 tons at the former and 91 3/10 tons at the latter. The quality of the product has been kept up to the former standard. The company management expressed its thanks and appreciation for the fine response to its appeal, saying that it is enabled through showings like these to meet all fair competition, assuring to the workers at the same time almost continuous operation and employment.

Several American promoters are planning to erect a large paper mill in the vicinity of Ipoh, British Malaya. The necessary machinery will probably cost well over a million dollars. The mill will have not only the local market to supply but an almost unlimited export trade to develop.

The membership of the Cost Association of the Paper Industry has been increased by the addition of the following firms: The New York and Pennsylvania Company, the Hammersley Manufacturing Company, the Richardson Company, the Kalamazoo Vegetable Parchment Company and the Neenah Paper Company.

Juneau, Alaska, has received the first shipment of Alaskan made wood pulp. It was part of a consignment contracted for by a paper mill in California. The pulp was manufactured in January in the Speel River plant of the Alaska Pulp and Paper Company and was shipped through Juneau under the direction of W. P. Lass, secretary and Juneau city manager for the company. The initial consignment, a test shipment of several tons, was brought over on a boat from Speel River by way of Taku Inlet. Mr. Lass says that the company's mill will soon be operating to its full capacity of twenty tons a day.

Employees of the Crocker-McElwain and Chemical Paper Manufacturing Companies, Holyoke, Mass., have agreed to the continuation of the individual employment contracts proposed by the firm heads. This ends, so far as the workers not affiliated with the Eagle Lodge of Paper Makers are concerned, the controversy over these contracts which began in the spring of 1920 when the proposition was introduced by Mr. McElwain. The Eagle Lodge has rejected the contract and the Lodge officials say they are unable to interpret the status of the paper makers who have signed, ignoring the action of the Union. Mr. McElwain considers the dispute settled, claiming that all unions represented in the company have agreed to his proposition, with the result that the paper mills have resumed operations.

In a summary of last year's business in the paper industry given out last week by the Federal Trade Commission, 1920 production of newsprint paper by mills in the United States is put at 1,511,968 tons, an increase of 10 per cent over 1919. The year ended with 24,763 tons of newsprint on hand, as compared with 15,369 tons carried over from 1919. The production of standard news, the grade used by newspapers, totalled 1,380,239 tons, an increase of 12 per cent over 1919. The productions of book paper, paperboard, wrapping paper, bag paper, fine paper, tissue paper, hanging paper and building paper all exceeded the amounts made in any of the years beginnig with 1917, when the commission began collecting figures.

Mr. Edward W. Connors, of the James W. Sewall forest engineering office, Old Town, Maine and Washington, D.C., is in New York and Boston making calls on land owners and operators in the interests of the Sewall organization. Mr. Conners reports that general sentiment is optimistic for the future in both pulpwood and lumber although present conditions are quiet. Another of Mr. Sewall's men who recently returned from an extended trip through the south reports much the same quiet confidence in a coming well-sustained business.

PULP AND PAPER NEWS

Up to date the timber probe has cost the Province of Ontario $69,519, according to information tabled in the Legislature by Attorney General Raney. R. T. Harding as counsel, has received $2,000 on account of fees. The commissioners have received $2,000 on account of services. Because of the enacting of legislation at Ottawa, prohibiting the payment of judges for services of this character. Hon. Mr. Raney said that no moneys would be paid to the commissioners for service after that statute came into effect.

The Canadian Pulp Machinery and Engineering Company, Limited, has been granted incorporation under the Ontario Companies Act with power to deal in and manufacture pulp making machinery. The capital stock is $200,000 and the head office is to be at Toronto. The provisional directors are Toronto students-at-law.

The Lincoln Paper Mills Company, Limited, Merritton, Ont. has turned one of its machines onto the manufacture of M. F. and S. C. book paper, sulphite bonds, and white wove envelopes and the first samples issued a few days ago are of excellent quality. The mill, in this department, has a capacity of from twenty to twenty-five tons a day.

The many friends in the paper trade of Mr. Robert Jennings, of the Ratcliffe Paper Co., Ltd., Toronto, will regret to learn that he has been confined to his home through illness for the past week.

Showing a big improvement in their passing game and in floor work, the Laurentide A.A.A. basketball five triumphed over the fast McGill University team, February 19th, at Grand'mere, by a score of 37 to 30. The game was hotly contested and cleanly played throughout, and provided plenty of interest for the crowd that filled the gymnasium.

When the Public Accounts Committee meets in the Ontario Legislature next Wednesday, Hon. Howard Ferguson will question the Provincial Auditor and R. T. Harding regarding the item of $50,000 accountable expenses of the Timber Commission. Hon. Mr. Ferguson has moved that the auditor be ordered to bring all accounts and vouchers and that Mr. Harding produce books vouchers and receipts.

Mr. Martin Anderson, of Port Arthur, who was in Toronto last week, reports wood operators getting out sawlogs, pulpwood and ties in the Thunder Bay and Rainy River districts as watching the weather signs with deep concern. Enormous losses will be entailed in the event of an early spring break-up, as large quantities of timber products would be left stranded in the woods and smaller contractors ruined. Lack of snow for normal hauling already has so handicapped operations in the camps that instead of calculating prospective profits, the contractors are hoping for no more than an even break on their season's work.

The Brown Corporation has bought Dansereau Island, in the mouth of the St. Maurice River, where preparations will be made to receive and saw the wood floated down the river. The building of the mills of the company at Ste. Angele, across the St. Lawrence will begin this spring.

The pulp mill of the Bathurst Lumber Company, which closed down at Christmas, has resumed operations. Angus McLean, manager of the company, points out that it had been found absolutely necessary to reduce wages, an all-round cut of twenty per cent having been made. While regretting the necessity of adopting that course, Mr. McLean said that it had been merely a question of cutting the wages and attempting to operate, or keeping the mill closed altogether. In the present condition of the market Mr. McLean explained that even with the reduced wages in operation the company stood to lose $27.50 a ton, as it would cost them that amount in excess of the market price to produce their commodity.

Mr. W. S. Cummings, of the Chemical Paper Manufacturing Co., Holyoke, Mass., was a business visitor in Toronto last week.

There have been some cases reported of supposed "dumping" of Genuine Vegetable Parchment Paper into Canada. This is contrary to the Canadian Law and such matters are investigated by the Customs Department. In days of slow business there is apt to be dumping of foreign made products into another country, and there have been cases reported of this being done in Canada, which matters should be promptly investigated.

Mr. F. H. Johnson will assume the duties of superintendent of the new sulphite mill of the Spruce Falls Company about March 18th. He comes from the Niagara, Wis., mill of the Kimberley-Clark Co. Needless to say Mr. Johnson is welcome to Canada.

Mr. John Hewitt, Jr., of Paper Sales, Limited, Yonge Street, Toronto, has returned from a business trip to Chicago and other western cities.

The Northern Foundry and Machine Co. Limited, Sault Ste. Marie, have recently issued a bulletin on their Double and Single Suction Pumps and Acid Resisting Bronze Fittings, copies of which can be had from their engineers and sales agents, Clayton, Neil & Jones, Ltd., Power Building, Montreal and at 152 Bay Street, Toronto.

Both the W. J. Gage Company and the Kinleith Paper Co., which held their annual meetings last week in Toronto, reported a satisfactory year's business. The officers of the W. J. Gage Company are H. H. Love, president; H. F. E. Kent, vice-president and A. G. Parker, secretary-treasurer. The officers of the Kinleith Paper Company are: President, H. F. E. Kent; vice-president, H. H. Love; treasurer, A. G. Parker; secretary, George H. Jefferson. It was stated at the meeting of the Kinleith Paper Co. that twelve dryers were being added to one of the paper making machines at St. Catharines which would be in operation in about three weeks time, and which would materially increase the output of the mill.

Mr. C. R. Whitehead, president of the Wayagamack Pulp & Paper Company, has returned from a business trip to England.

The Markets

CANADIAN TRADE CONDITIONS

Toronto, Feb. 26.—Stocks of paper in the warehouses are gradually being reduced in consequence of somewhat improved trade conditions, although generally speaking the volume of business being done is small. There are encouraging signs, however, and these are seen in more enquiries and slightly larger sales in some lines of paper than have existed for some weeks. It is believed that the stage is slowly being reached when printers and consumers will have to come into the market again and replenish their stocks and there are already some indications that this is being done. The mills, however, are said to be rather slack under the lessened demand and adverse power conditions and tonnage has fallen off considerably in some lines. The market for raw stock is still down and the pulp transactions are few in number and small in volume. The printing trade is showing some signs of improvement but printers are not stocking any and are buying for immediate requirements only. As a consequence most jobbers are doing a good counter business but the big orders either locally or for shipment are small.

The market for books, bonds and ledgers and most other lines is in a very unsettled condition and so far the efforts of the jobbers to cooperate with the manufacturers to get prices down to something like a stable and permanent basis, consistent with costs, have not borne very much fruit. Jobbers complain that some of the manufacturers are going over their heads in the matter of sales and there are said to be cases where the printer is being sold direct. The jobber holds that he should be given the benefit of fixed prices and if there are any reductions he should be the one to pass it on to the consumer. One jobber, who does not believe in mincing words, says that the paper manufacturers have not yet come down from their high position as barons in the trade, to which they were elevated during the big paper boom, and he declares that they should be re-educated after the manner of the returned soldier. So far, he said, it had been found impossible to get them to fix a basic price on anything and they were still trying to meet competition irrespective of cost. As a result the jobbers did not know where they were at in regard to prices—nor would they until the manufacturer ceased "hunting with the hare and running with the hounds," and the jobbers are afraid to buy. There was, he said, too much lack of faith and confidence between the manufacturer and the jobber.

KRAFT AND WRAPPINGS.—Manufacturers of kraft paper, who have been passing through an extremely quiet period, report that conditions are gradually improving, and the situation is made better by reason of the fact that there are no large stocks of paper on hand either at the plants or in the hands of the jobbers. Considerably more enquiries are coming in and the orders are increasing in size. The Wayagamack mill has not yet completed its renovations, but expects to be running again in a few days now. Kraft paper is still quoted at $11.50 and pulp at $115. Wrapping paper jobbers say that stocks are gradually becoming levelled out, with the exception of some odd lines, and that there are signs of a picking up in business generally, with many more enquiries and a few more sales. There are no changes in prices.

COATED PAPERS.—The coated paper mills are running at capacity and some of them are still working on back orders. The paper depression has not reflected itself on the coating mills to any extent and there is a fair demand for its product.

TISSUES AND TOILETS.—Business is still extremely dull in tissues and toilets and light weight papers generally and the market is very unsettled in consequence of a certain amount of price-cutting that is taking place. As a consequence the mills are operating under a handicap and with the demand considerably off they are having some difficulty in disposing of their tonnages. Better things are looked for within the next few weeks, however, and there is a general feeling of optimism in this branch of the trade.

PULPWOOD.—There is little change in the pulpwood situation in Quebec and Ontario. There is quite a large stock of wood which is now being hauled out in Quebec but the demand for it is very limited and there is a reluctance on the part of the mills to contract for their supply of wood just now—a condition that prevails in all lines of trade. A Quebec company informs the Pulp and Paper Magazine that they are receiving some enquiries for quotations, which would indicate that mills are now beginning to take in hand the matter of purchasing their supplies of pulpwood. The firm mentioned is inclined to believe that just as soon as business conditions are normal and stable, pulpwood prices will improve. Taking into consideration the high cost of pulpwood during 1920, the price today is down now to a very reasonable price—practically the actual cost, plus a reasonable profit for stumpage and carrying charges, which would lead to the conviction that the present is the right time for the mills to step in and pick up a supply of wood at a low figure. Pulpwood is quoted at $30.00 F.O.B. cars Watertown.

RAG AND PAPER STOCKS.—The new cotton cuttings market has continued easy in tone on account of the absence of the worth while consuming demand. Inquiries from mills have been reported on occasions, but the price offered has generally been a prohibitive figure for dealers unless they are to obtain their cuttings from packers at considerably under present levels. Prices have, as a whole, been nominally unchanged. The waste paper market has been rather a slow affair, and prices still show some measure of instability. Most of the mills are buying just enough stock to keep their mills running, and in no cases are they stocking up for they believe they will be able to secure material at the present prices for some time to come.

	Per Cwt. F.O.B. Toronto.
No. 1 shirt cuttings	$16.00—$17.00
No. 1 unbleached cotton cuttings	11.50— 12.00
No. 1 fancy shirt cuttings	8.00— 8.50
No. 1 blue overall cuttings	8.00— 8.50
Bleached shoe clip	12.50— 13.00
White cotton hosiery cuttings	14.00— 14.50
Light colored hosiery cuttings	13.00— 14.00
New light flanellette cuttings	11.00— 11.50
No. 2 white shirt cuttings	7.50— 8.00
City thirds and blues (repacked)	1.90— 2.00



·TRADE·MARK·
REGISTERED

SOLE AGENTS in the United States, Canada, Mexico and Cuba for

Finnish Cellulose Association, Helsingfors, Finland

comprising all and every Sulphite, Sulphate and Kraft pulp mill in Finland, Manufacturers of superior grades of Bleached and Unbleached Sulphites, Easy Bleaching Sulphates and Kraft Pulps.

—ALSO—



Trade Mark

SOLE AGENTS in the United States, Canada, Mexico and Cuba for

Finnish Wood Pulp Union, Helsingfors, Finland

a combination of the foremost Ground Wood Pulp and Board Mills in Finland, makers of various kinds of boards and dry and wet Brown and White Mechanical Wood Pulp.

Get the most for your money by getting next to our qualities and prices!

WOOD PULP

TRADE MARK

Lagerloef Trading Company, Inc.

18 East 41st Street, NEW YORK, N. Y.

Telephone: Murray Hill 4246-47
" " " 2170

INQUIRIES SOLICITED

Flocks and satinettes	.90—	1.00
Tailor rags	60—	.70
Gunny bagging	1.10—	1.20
Manila rope	3.50—	3.75
No. 1 white envelope cuttings	5.00—	5.25
No. 1 soft white shavings	4.00—	4.50
White blanks	2.00—	2.15
Heavy ledger stock	3.00—	3.25
No. 1 magazine	1.75—	1.90
No. 1 book stock	1.35—	1.50
No. 1 manila cuttings	2.50—	2.75
No. 1 print manila	1.00—	1.25
Folded news	.75—	.90
Over issue, news	1.00—	1.15
Kraft	2.25—	2.50
No. 1 clean and mixed papers	.50—	.60

NEW YORK MARKETS.

New York, February 26—(Special Correspondence)—In point of demand from consuming quarters, there is very little improvement apparent in the paper market. Buyers are still operating in hand-to-mouth fashion, coming into view only when actually and immediately in need of supplies and then confining orders to paper directly required. There are no indications in any quarter of anyone being willing to anticipate forward needs, and, individually and collectively, current sales involve but light amounts of paper. Jobbers in New York and in other large distributing centres seem determined on keeping their stocks as low as possible and are ordering from mills merely when having orders in hand from their own customers. The printing industry here is experiencing unusual dullness and this accounts in a large measure for the lack of important demand for various kinds of paper, especially fine and book grades. Owners of print shops assert that the high cost of printing, due to the excessive wages they are obliged to pay their help, is partly to blame for the prevailing quietness in their line, and are seeking to effect a cut in the wage scale. A meeting of employing printers in New York was held this week at which this matter was discussed, and as an outcome of this conference the printers' union is being prevailed upon to consider a wage reduction, it being pointed out that if printing can be produced cheaper everything favors more work for the industry.

Reports from paper producing centres continue to tell of unfavorable conditions existing there. A majority of paper and board mills are shut down or are operating on greatly curtailed schedule, and the few running full are reported rapidly catching up with their orders with new business developing slowly. Paper manufacturers are wisely closing down their plants rather than continue operating to pile up heavy stocks of their product. This is indeed a satisfying condition in that it means that when demand broadens it is unlikely there will be any excessive surplus of paper to weight down the market.

A consensus of opinion now is that considerable improvement in market conditions will come about by the middle of March. Encouraging activity in other commodity lines leads paper men to expect matters in their trade to pick up soon after the inauguration of the new administration in Washington, and in the meantime nearly everyone making or dealing in paper is pursuing a waiting policy pending developments.

The newsprint market is at best in an easy position Demand for spot supplies is close to nil and the surplus of paper on the market naturally has a weakening influence on prices. It is difficult to say just how low newsprint can be purchased. There have been reports of sales down to 5 cents per pound, yet it appears doubtful whether any sizable tonnage can be secured for spot delivery at less than 5.50 cents. The latter figure is the approximate market basis agreed on by representative members of the trade, who, however, admit that probably "distress" lots can be obtained at lower prices.

An encouraging feature in the newsprint trade is that those publishers who when domestic paper was high in price and hard to get contracted ahead for European newsprint are now endeavoring to resell their imported stock to replace with domestic or Canadian paper. The reason for this is that the foreign newsprint has given poor satisfaction, and it is definitely known that in certain cases publishers have sold imported paper at a loss and covered requirements with domestic newsprint which is now freely available. The experiences of these publishers, which are being openly related in the trade, should discourage the further importation of newsprint from Europe.

Book papers are moving slowly except on contract and prices are still receding. Machine finished book is now available at 9.50 cents, and some mills are quoting even lower figures. Super book is offered by mills at 11 cents, while coated books is quoted at from about 13.50 cents upward. The sharp decrease in advertising, resulting in less consumption of paper by magazines and other periodicals, explains the reaction in the book paper market, but confidence is felt that when business generally improves advertising will pick up, thus making for a heavier consumption of paper.

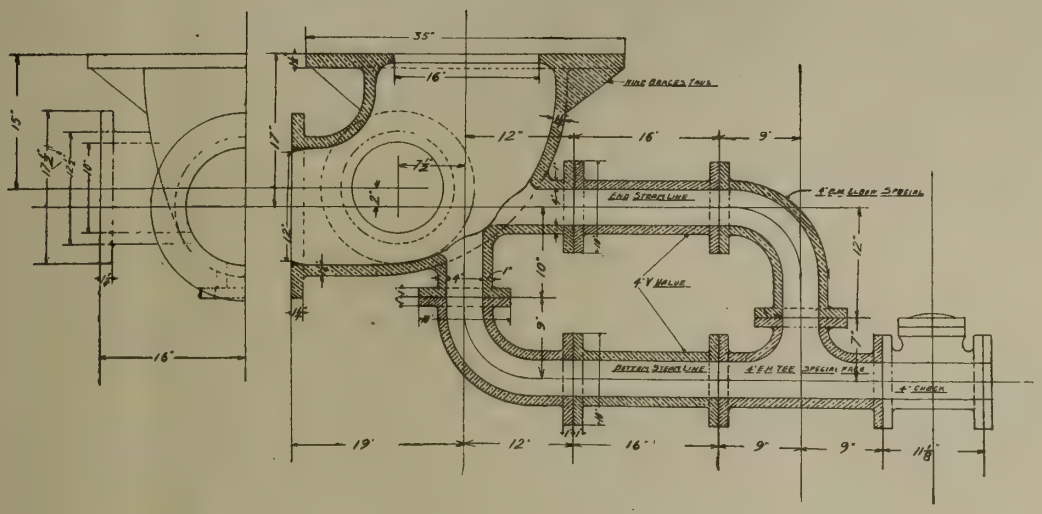
The board market rules weak and mills in frequent instances are selling at prices below the cost of manufacture. Several of the eastern mills have marketed plain chip board in New York this week at as low as $30 per ton delivered and filled news board at $32.50, which is unquestionably under the basis at which board

Scandinavian American Trading Co.

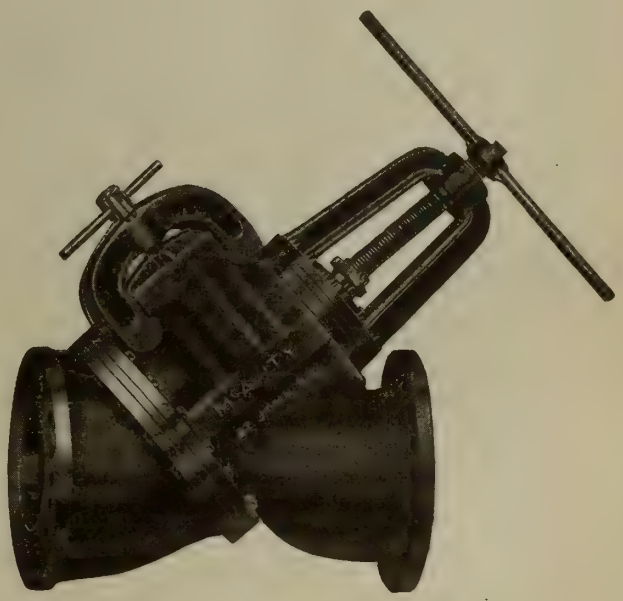
50 E. 42nd STREET TELEPHONES 8311 8312 MURRAY HILL 1813 NEW YORK

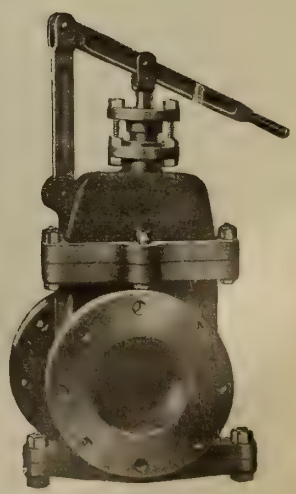
Have an extensive and steady market for KRAFT PULP When you have any surplus to offer write us

"Where the wear comes"



On your digester fittings and acid lines—This is where the superior acid resisting qualities of "World" Bronze are apparent. It has been proved by many users throughout Canada that wherever Bronze is required to withstand acid, it pays to specify "World."





T. McAVITY & SONS, LTD.

Montreal
Toronto
Winnipeg
Vancouver

ST. JOHN, N.B.
CANADA

can be made profitably today. Manufacturers are exerting every effort, however, to keep running and maintain their mill organizations, which accounts for them selling board so cheaply.

Fine papers are in slack demand with what little buying is being done involving in the main the lower qualities. About the lowest price named on bond paper is between 12 and 13 cents per pound at mills, while more popular lines and fetching around 17 cents a pound.

GROUND WOOD.—Mechanical wood pulp is moving in small quantities and prices are on a broad range. Figures all the way from $45 up to $65 per ton are quoted in different parts of the trade and it is difficult to say just what constitutes the market value of ground wood today. Actual sales at $45 have been recorded, yet representative producers in some cases are asking $60 and $65 at mills and are refusing to sell for less, claiming that present manufacturing costs do not justify their doing business at lower prices levels. Board mills are buying very sparsely and this accounts largely for the dull demand, as this class of consumers are ordinarily among the the most important buyers of pulp in the open market. Producing plants are reported closing down, and there is no great amount of selling pressure despite the slack demand coming from consuming quarters.

CHEMICAL PULP.—Chemical wood pulp is meeting little worthwhile demand. Papermakers explain their lack of buying interest by the dullness prevailing in the paper market and the resultant shutting down of mills, and aside from shipments on contract and an occasional sale of small tonnage at sacrificed prices, there is practically no business doing in pulp. Prices are in the main nominal. Mill agents and importers are themselves at a loss to say what can be obtained for the different grades of pulp, having no established basis to guide them, and are mostly holding off from trying to effect sales until consumers evince more interest.

RAGS.—Prices on new cuttings are tumbling at a rate probably never before witnessed. The situation in this end of the papermaking rag market is very nearly demoralized, and offerings of some grades have been reported denoting sharp recessions. Even at the reduced prices mills have shown scant desire to buy, it being their contention that they are not in need of stock at present and not being willing to absorb supplies on a declining market. No. 1 white shirt cuttings, it is authoritatively stated, have been secured by mills at as low as 13 cents per pound delivered, while No. 1 washables are offering at 5.50 to 6 cents a pound f.o.b. shipping point, white lawns at 12 cents, unbleached muslins at 11.50 cents, new blue overall cuttings at 8.50 cents and new light silesias at 8.50 cents. Old rags tend lower but there has not been the decline recorded as has marked new cuttings. Roofing rags are holding fairly at around a cent per pound at shipping points for No. 1 packing, and some felt mills display willingness to contract ahead for supplies at this basis. Old whites rule unchanged at last week's levels, and thirds and blues, while strictly nominal in price, are at about previous quotations. The market in its entirety lacks important activity and everything appears in favor of further decline in values unless demand from consuming sources broadens considerably.

PAPER STOCK.—The market for old paper continues in the doldrums. There is but a slight movement into consuming channels and the aggregate amount of any one grade being absorbed by mills is not sufficient to sustain prices, with the result that values are steadily seeking lower levels. Numerous small packers are reported shutting down their plants and looking for other forms of employment, it being contended that there is no profit in collecting and grading paper to be sold at today's market prices. In spite of this, supplies are in excess of buyers' wants and those in the market are succeeding in getting stock at almost any figure within reason they offer.

Sales of No. 1 soft white shavings to mills at 3.25 cents per pound f.o.b. New York have been reported, while hard white shavings of No. 1 quality have sold at 4.25 cents, heavy book stock at 1.50 cents, white news cuttings at 2.25 cents, old No. 1 kraft paper at 2 cents and ledger stock at 2.25 cents. Folded newspapers are offered at 57½ to 60 cents per hundred pounds with few takers, while No. 1 mixed paper is freely available at 40 cents per hundred. Ordinarily in dull times there is a demand for some kind or another of paper stock but today there is no grade wanted, and dealers say that never before have they witnessed the situation quite so unsatisfactory.

OLD ROPE AND BAGGING.—Inquiry for old rope is fair although consumers have not as yet increased their buying to any material extent. Quotations range around 4 cents a pound for domestic Manila rope in No. 1 condition, while mixed strings are quoted at about a cent a pound at shipping points. Demand for bagging is at a standstill and prices are altogether nominal.

PULP AND PAPER HOCKEY.

Monday night was an exciting time for the hockey fans at Victoria Rink, Montreal. The Pulp and Paper League has but one more regular game this season and interest in the outcome is intense. Abitibi has been playing consistently good hockey, but misfortune was with the team till this week, when they beat the strong Riordon team 2 to 1. Howard Smith Paper Mills beat C. M. Dawson 3 to 1 and Canadian Export Paper Co. walked on McFarlane, Son and Hodgson 4 to 0. A crowd of 1,500 jammed the spectators' portion of the rink.

A great game occurred last Thursday night, when the La Tuque (Brown Corp.) team, after winning the pennant of the St. Maurice Valley was defeated by McGill, 6 to 4.

UNITED STATES NOTES.

While as yet there is but one small pulp mill in actual operation in the vast timber areas of Alaska, a report from Seattle indicates that capitalists, both in Alaska and elsewhere, are scrambling to obtain permits to develop the water power of the North. A total of 143 such applications had been received by the Federal Water Power Commission up to the beginning of the year, and dozens more since. It is predicted that the outcome of the year's activities will result in the establishment of at least three pulp plants among the numerous projects now in course of development.

Matters of unusual importance are due to come up at the annual meeting of the Boston Paper Trade Association, scheduled to meet in Boston March 16. The committee in charge of arrangements has plans for the gathering well under way and is making every effort to secure attendance by most of the members.

News From Our Advertisers

AN EARLY MANUFACTURER OF PULP AND PAPER MACHINERY.

That size of plant or quantity of output is less of a factor than a reputation for continuous production of high class machinery and the ability to manufacture under efficient and economical conditions is the impression the editor got from a recent visit to the plant of Waterous Engine Works at Brantford, Ont. The views shown in the accompanying illustrations give but faint idea of the equipment in the main machine shop. It will be seen that there is a spacious main floor surrounding which is a gallery where all the smaller work is carried on and the light machine tools are located. It happened that a shipment of beaters had just been made so the usual amount of paper mill work was not at the time in evidence, but a number of pulp screens were under construction. These were the well-known Quiller type in which it was noted that a very considerable improvement had been made in the latest types of runner by which a much more rapid and more uniform distribution of the stock is obtained. A number of these screens were seen in various stages of completion. Besides this work which was actually under way, the facilities were seen for the manufacture of open frame flat screens, grinders, chippers, deckers, and wet machines. Many other machines of interest to the paper maker which the Waterous Company was found to be equipped for making should be noted; various items of logging and wood preparing apparatus, variable speed and other types of engines, magazine grinders, defibering apparatus, etc.

The plant is provided with up-to-date facilities for making its own castings and an electric welding outfit was also noticed.

Several departments of the plant were considerably disjointed by the large amount of military work done during the late war and in changing back to the manufacture of peaceful products, the opportunity has been taken for installing more modern machinery and making a more officient arrangement of equipment.

Several generations have been building the reputation of the Waterous Company and it is gratifying to see the younger members continually coming in and taking an interest and an efficient part in the further growth of the company.



Main Floor of Machine Shop, showing Three Rotary Screens under construction.



A View of the Foundry.

NEWS FROM EUROPE

Russian Notes.

Flax was one of the most important Russian industries. Clear evidence of the state of the country is afforded by the harvest figures. Before the war the annual production of flax in Russia was 20 million pouds, (1 poud=about 39 lb.) while the 1919 harvest was only 4.5 million pouds. This year's harvest will be even smaller. There is no inducement to grow flax, as there is no market.—Zeitschrift für angew. Chemie, December 23, 1920.



Patented in Canada and U.S.A.

Hardy Automatic Stuff Regulator

Is made in three sizes:

5″ (Dia. of the pipe) Capacity from 3 to 15 tons per 24 hrs.
10″ " " " 15 " 40 " " "
15″ " " " 40 " 70 " " "

In use also on dry sulphite.

THE TESTIMONIAL WE HAVE ON HAND

"In reply to your letter of the 10th, regarding 'HARDY' Stock Regulator, which we have installed on our No. 2 Paper Machine.

"Our experience with your regulator has been most satisfactory. We are now able to maintain a very uniform sheet on this machine, running at a speed of 645 ft. We might further say that we often run through twenty-four hours with a variation of less than one-half lb. on a double sheet."

Let us give you such a service.

MILLS WORKS & MACHINERY LTD.

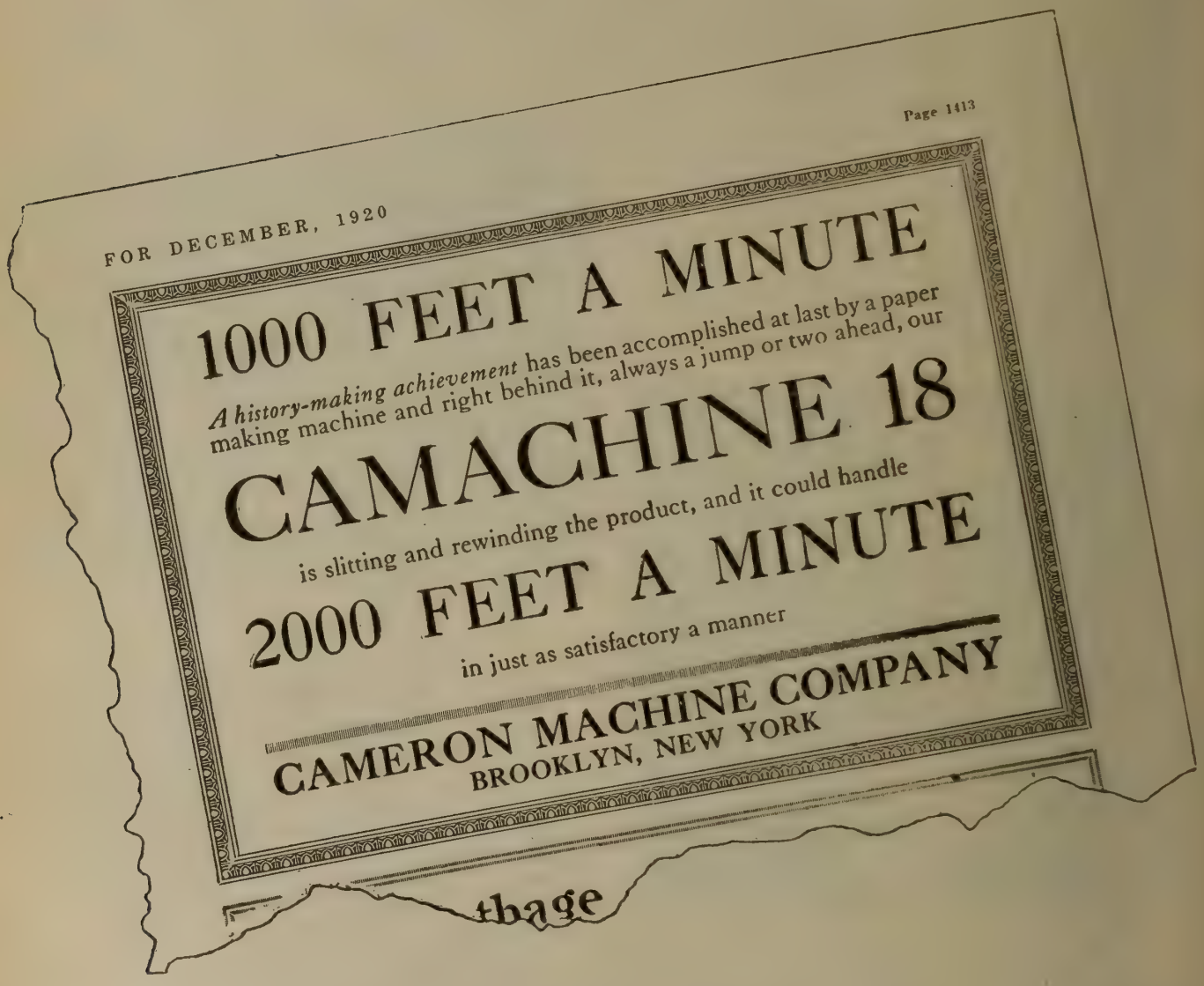
PONT ROUGE, QUE. CANADA

This Advertisement is Paid for

By

SAMUEL M. LANGSTON COMPANY,

CAMDEN, :: :: N. J.



The Letter on the opposite Page is published by permission of

WAUSAU SULPHATE FIBRE COMPANY

Samuel M. Langston Company is building for Wausau Sulphate Fibre Company a new design of Slitter and Winder, which we expect will be capable of handling the output of this machine when running 1,000 ft. per minute. At present it takes a Cameron and a Langston Winder running as fast as they can go to do this.

Read This Letter, Then Read The Opposite Page.

ADDRESS ALL COMMUNICATIONS TO THE COMPANY AT MOSINEE, WISCONSIN, FOR ATTENTION OF WRITER

WAUSAU SULPHATE FIBRE CO.

MOSINEE, WISCONSIN

January 25, 1921.

Samuel M. Langston Co.,
Camden, N.J.

Gentlemen:

In reply to your recent inquiry regarding advertisement of Cameron Machine Co., I wired you yesterday as follows:

"Regretting delay in answering your recent inquiry as to advertisement of Cameron Machine Company beg to say that if the Cameron Company's intention is to convey to the paper trade the idea that their winder is taking care of all the paper produced when running one thousand feet per minute they are not stating the truth in the matter, because as you saw yourself when you were here, we use two winders to take care of this production and when running one thousand feet the Cameron winder cannot even take care of twenty-four inch rolls, say nothing about nine inch rolls. We do not understand the idea of their advertisement. Mr. Cameron himself knows perfectly well that we have had all kinds of trouble with his machine and he also knows that it is not taking care of the paper wher the machine is running one thousand feet."

Yours very truly,

WAUSAU SULPHATE FIBRE CO.

BY - O. Bachelder

OBW-IC Vice Pres. & Gen. Mgr.

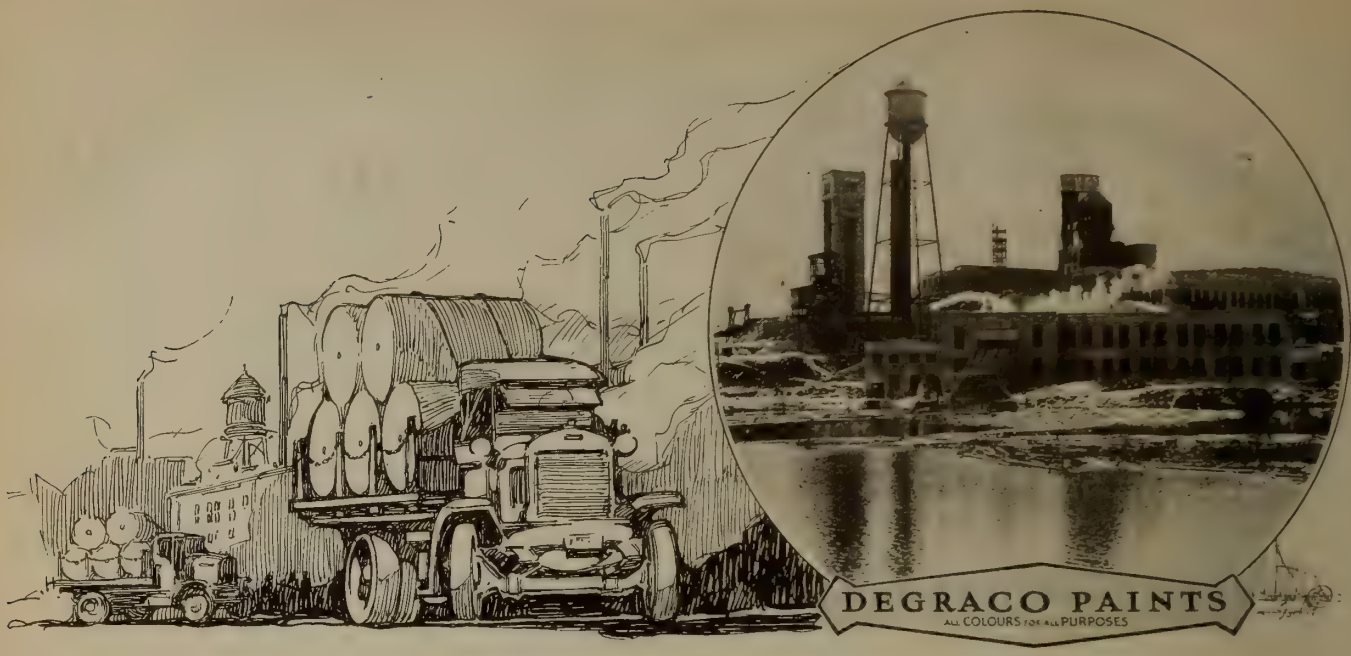
MOSINEE KRAFT
ONE GRADE - ONE FURNISH - ONE SHADE

SAMUEL M. LANGSTON COMPANY

CAMDEN, :: N.J.

Next Week we will show our New Design

SLITTER AND WINDER.



Comparison—The Proof of High Quality

Where a particular paint is taken as the basis of comparison and used as a standard, it is an acknowledgment of its superiority and leadership.

When you hear people say that a paint is as good as **Degraco Paint**—it is your assurance of safety and satisfaction if you buy **Degraco Paint.**

There is a **Degraco Paint** specially manufactured to give maximum service on every paper mill surface—for every service requirement. Their reputation for leadership—maximum durability—lowest ultimate cost—is the result of satisfactory service covering a period of thirty years.

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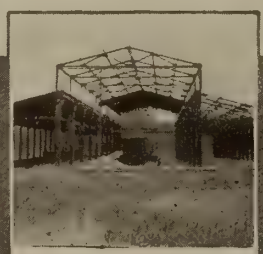
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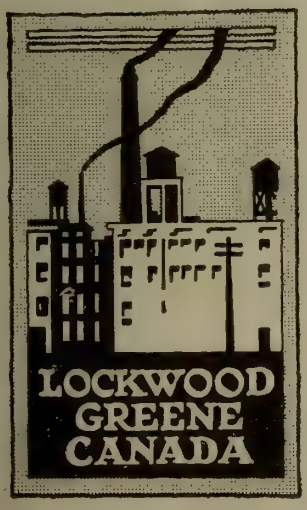
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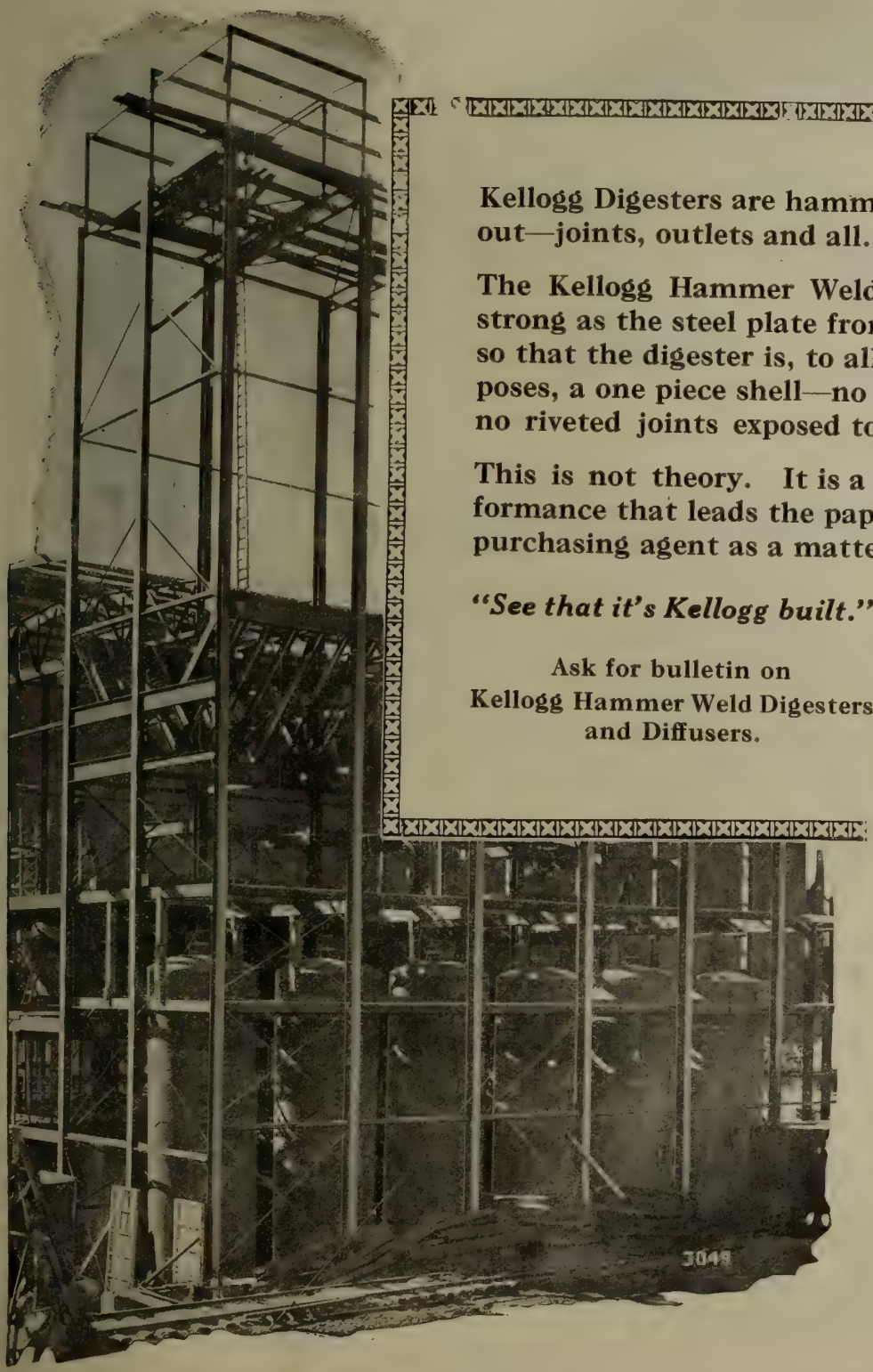
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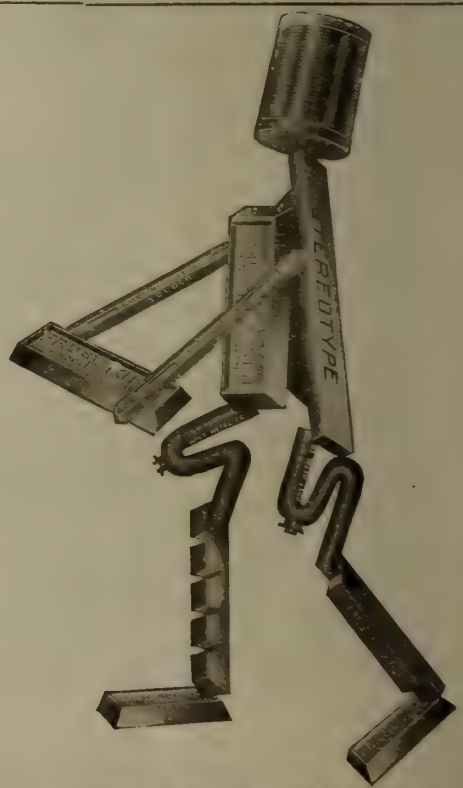
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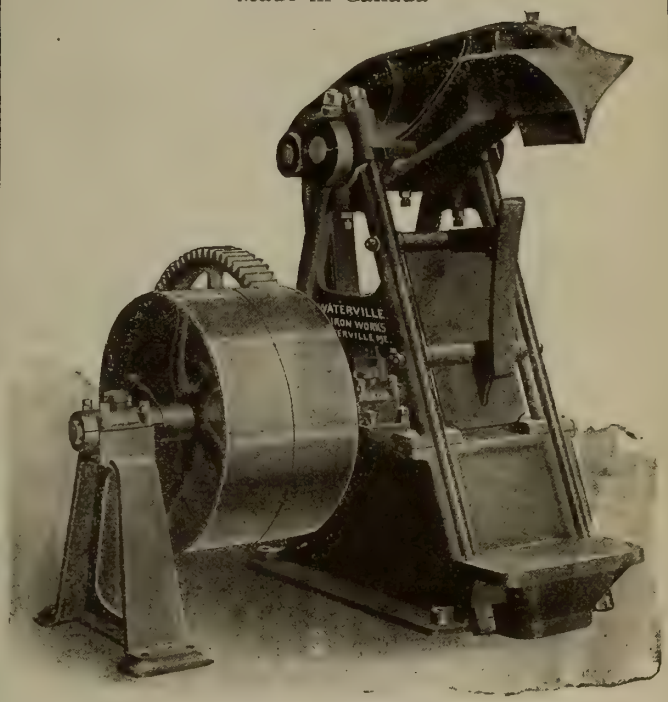
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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., March 10th, 1921. No. 10

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Room 205 Drummond Building. Montreal. 'Phone Uptown 7773

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

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J. NEWELL STEPHENSON, M.Sc., Editor.

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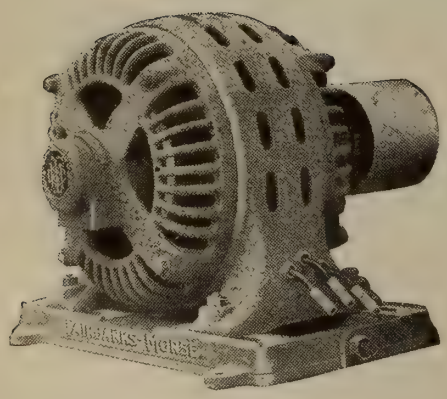
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EDITORIAL

IN THE GAME.

It took us some time to decide on the title for this editorial and have come to the conclusion that "In the Game" expresses both the facts and the policy of the Industrial and Educational Publishing Company with regard to their attitude toward the paper making fraternity. When we say we are in the game, it means that the publishers of the Pulp and Paper Magazine and the other periodicals printed at the Garden City Press at Ste Anne de Bellevue, decided some time ago to establish a paper mill to supply their own needs and possibly at times have a little to spare. It might be well to state briefly the present extent of the operations of our company in the publishing field. At the Garden City Press the company own and publish besides the Pulp and Paper Magazine, the Canadian Mining Journal, which is also weekly, The Canadian Textile Journal, which is by-weekly, The Canadian Fisherman and Iron and Steel of Canada which are monthlies, and the Canadian Bookman, a quarterly; besides these they issue the Journal of Commerce every week, the Teachers' Magazine monthly, the MacDonald College Magazine quarterly, the Bulletin of the Canadian Mining Institute monthly and the United Farmers' Guide with its circulation of nearly 20,000 weekly. From the Toronto plant which is situated at 263 Adelaide St. W. an immense amount of job printing is done, including the work of several well-known Canadian publications of large circulation.

The Industrial and Educational Publishing Co. have already felt the need for undertaking the publication of books and that development will of course, require more paper, while their magazine printing plant has grown steadily. On moving here from Montreal barely two years ago, the printing capacity was increased 100 per cent and another 50 per cent had to be provided for at the beginning of this year. What seemed to be very commodious quarters are already showing signs of becoming crowded so that further building of the printing plant will doubtless be necessary before another year has passed. To arrange for such a supply of paper as will be required by the ultimate need of their presses, it seemed entirely the proper thing for the company to establish their own source of supply.

There are many advantages in the location at Ste Annes for the manufacture of magazine papers. In the first place the Company have a large piece of ground immediately adjoining the railway where it will be convenient to join the Grand Trunk and the C. P. R. lines with an inter-switch and an extension of the present freight siding will put the track right alongside of the building it is proposed to erect this summer. The mill would be within twenty miles of Montreal which will be a convenient and adequate market for the waste papers that will be the principal source of the fibre. Being on the two principal railway lines and also but a few hundred yards from the Ottawa River Canal system, it will be easy to bring sulphite, coal, clay and other materials by boat—a very convenient means of transportation. Being also on the direct road to Toronto, they can conveniently ship to the Toronto plant. An electric truck can bring the paper from the finishing room of the mill to the press room of the Garden City Press in a very few minutes as the two buildings will be hardly more than a hundred yards apart.

The slope of the land owned by the company will make the construction both economical and satisfactory. Comparatively little excavation brings us to solid rock which is just the right level below the railway siding. It is probable that oil fuel will be used so that the whole plant can be most easily maintained in keeping with the character of the community in which are located besides the Garden City Press, The Military Hospital and MacDonald College. The general layout of the mill calls for a paper machine room with basement about 70 by 250 feet; across one end of this, towards the railway, will be the finishing department in the receiving floor housed in a building about 60′ x 120′ and probably of four stories. Across the other end will be a building of similar size for the de-inking plant and fibre preparation. The dry end of the machine will naturally be adjacent to the finishing room. The power plant will be located in the corner made by the machine room and the fibre preparation building. The mill is being planned to accommodate a second paper machine when this becomes necessary.

The company had not contemplated quite such precipitous entrance into the manufacture of paper but the site of the Wanaque River Paper Company at Wanaque, N. J. was condemned by the Public Service Corporation of that state because the location was required to be included in the area to be flooded by a new reservoir. The whole plant was obtained on terms which made it advisable to go ahead immediately with the proposition. The intention is to break ground as soon as the frost is out and proceed to build the mill and install the machinery. The use of electric power will make it unnecessary to bring to Canada some of the equipment which is included in the bill of sale and a possible re-arrangement of some of the departments, because of the balance of roll and sheet paper required by the Company's activities, may also eliminate some of the other machinery. At any rate it will be some

months before the plant is in operation again in its new quarters and we are hoping, even anticipating, that before that time the aspect of the paper situation will be much brighter than it is at the present time.

It may be said in conclusion that the decision of the Industrial and Educational Publishing Company to make their own paper is brought about largely by the rapidity of the growth of their enterprise, which will be further facilitated by eliminating most transportation difficulties and other uncertainties due to the somewhat parallel growth of other publishing houses has been putting quite a strain on the present sources of supply. This company has always enjoyed and appreciates the happy relations with and many courtesies from the manufacturers from whom our supply has been obtained for many years and we are sure that getting into the game will only serve to bring us in closer contact with our good friends and no doubt enable us to understand more fully the difficulties which at times have made it hard for them to accommodate all our desires. Things have happened so fast in the last two weeks that a great many details have not yet been worked out but such information will be forthcoming as it becomes available.

FAITH IN THE FUTURE.

The Industrial and Educational Publishing Co. believe in the future of Canadian literature. To aid in encouraging and inspiring those who have genius or ability in the art of letters, the company publishes, at the Garden City Press, the Canadian Bookman, under the editorship of Mr. B. K. Sandwell. Progress is made by organization and co-operation, so the Canadian Bookman has arranged for a convention in Montreal, March 11 and 12, of authors and others interested in the development of Canadian literature.

COBWEBS.

This is getting to be quite a personal page, but it wouldn't do to pass an event that means much to those at the Garden City Press. The United Farmers' Guide with its large circulation and important constituency saw fit to adopt our plant at Ste. Anne de Bellevue for its place of publication. To express a hearty welcome to this important weekly and to introduce the owners and editors to their new friends and associates in this district, the staff of the Garden City Press entertained at dinner at the New Clarendon Hotel at Ste. Anne de Bellevue last Friday evening. Nearly 200 guests were present. Hon. W. S. Fielding presided and Hon. T. A. Crerar, president of the great Grain Growers Association was the principal speaker. Mr. Chipman of the Grain Growers Guide, Winnipeg, and Col. Archibald of the United Farmers' Guide described the growth of farmers associations and representatives of other Canadian industries were called on. The meeting was distinctly non-political; scarcely a reference was made to matters of government.

Canadians have reason to be proud of the accomplishments of our paper makers. Our newsprint and pulp mills have been acknowledged to be in the forefront of progress. Now our fine paper mills have produced achievements worthy of a much older industry. The Howard Smith Paper Mills commemorate their "extra strong" grade in a beautiful booklet. They have also sent us samples of their blotting papers, a new line for Canada; it is very thirsty blotting. Our other Quebec friends, the Rolland Paper Company have also issued a new catalog of their excellent papers. Canadians have no excuse now for going elsewhere for any grade, to the very best, of regular lines of paper.

The campaign against venereal diseases, which is being waged by the Quebec authorities is most commendable. The coming generation, if it takes hold will contribute more leaders of thought and fewer inmates of asylums.

In one year's operation of the plan of Group Insurance, the dependents of men employed in the Spanish River Company received $12,250 in death benefits and in the short time since its inauguration by the Belgo Canadian Company, two claims totalling $2500 were paid. A few years ago these widows and their children would have been in a much sadder plight. The world "does move," as the ancient astronomer said.

The astrologers say that March, which is the month of Aries, the Ram, is a month of energy and progress. The "Amphibian" calendar adds that far-seeing men will meet with success this month. That is our idea—in order to meet with success one must be on the look out for it.

Remember, all through 1921, that "Made in Canada" means "Paid in Canada."

This soft weather will make it bad for getting out pulpwood and timber.

"ELECTRIC PAPER DRYERS."

In its issue of February 25th, the St. Maurice Valley Chronicle writes under the above heading, as follows:

"A lecture of great interest to paper manufacturers was given at the Technical School Thursday afternoon at 4 o'clock on the subject of electrical dryers for paper. The Laurentide has already installed a machine of that kind, and it is understood that the method is very successful."

What really occurred was told in the Pulp and Paper Magazine last week.

The Laurentide Company have issued a very fine brochure entitled "A Few Facts About the Laurentide Co., Limited." It describes briefly the principal departments and activities of the company and is nicely illustrated.

A little sunshine now and then, is relished by the best of men.

Fitting the Foreman for his Work

Realizing the importance of the trained foreman in the executive duties of his position, the Pulp and Paper Magazine asked the Business Training Corporation to describe a few instances of what such training can accomplish. Other concerns engaged in this work have had similar results.

The paper and pulp industry has gone through so many fluctuations during the past ten years that it has held out a constant invitation to "business doctors" to help it over its periods of stress and strain. First there is a campaign to modernize equipment, then to raise efficiency and reduce costs, then to stimulate production, then to harmonize industrial relations, etc., etc. When labor is scarce and demand is heavy, "production at all costs" is the watchword. Manufacturers are driven to radical expedients to placate labor and are tempted to grasp at Utopian schemes of industrial democracy proposed by social dreamers in order to keep peace in the family. When the conditions are reversed and labor is begging at the gate for employment another set of grim-faced specialists are knocking at the door to advise the manufacturer on reducing wages, fighting unions, and turning his shop into a cold-blooded but efficient piece of mechanism.

While many manufacturers were yielding to the hysteria produced by these extreme conditions, trying to take advantage of temporary ups and downs through the use of patent nostrums, others have been calmly getting their house in order on a permanent basis by putting all of these problems of production squarely up to the logical man—the foreman on the job. After all, what problem is there in manufacture—be it industrial relations, safety, lowered costs, better quality, wage adjustments, increased production, or anything else—which will not ultimately yield to the ministration of intelligent, broad-gaged, energized foremanship? The right kind of a foreman is usually able to keep his team functioning harmoniously, smoothing out misunderstandings among the men, and stimulating them to better effort. If a wage reduction is necessary he can "sell" his men on the idea because he has their confidence. If an improved system of costs is introduced, better methods of routing and despatching are worked out, the foreman is the man who makes these plans succeed or fail. If he has a clear understanding of the principles on which efficient production must rest, he can then cooperate intelligently with the planning and engineering departments.

Few will gainsay that the key to most improvements in the shop is the foreman and that if a plant had nothing but able foremen and assistants there would be much fewer labor troubles and more economical production. The only trouble is that the average foreman does not measure up to these requirements. And this is not entirely his fault. The mere act of loading responsibility on a man does not necessarily qualify him to discharge them effectively. In the normal paper mill, for example, a workman perfects his craftsmanship over a period of years, gets a reputation of being conscientious, reliable, and efficient, and then one day the superintendent calls him to the office and says, "Jim, I have decided to make you foreman of the—Department." The next day Jim takes on his new duties with an amazing amount of ignorance about every one of them. He may have a genial personality which enables him to get along pleasantly with the men under him. His knowledge of the machines and processes comes in handy, but his executive ability, never having been developed, breaks down at the slightest strain that is put upon it. Instead of being a workman with nothing but his own job to think about, he is now a representative of the management and has to carry out its plans and policies. These duties are so different from the ones he formerly had that several years are usually taken to get adjusted to them and in many cases the adjustment never takes place. As for constructive work, he usually has such a hard time catching up with the many requirements of his job that he never develops the ability to put new ideas into it.

It is only recently that this state of affairs has been clearly realized by manufacturers and steps taken to correct it. Since it has been found that investments in improved equipment and industrial engineering can only be made profitable by having enlightened foremen, plant managers have been addressing themselves to the fundamental problem of training their key-men in an endeavor to make real executives out of them. Sometimes this training effort takes the form of occasional plant gatherings at which the boss tries to explain the policies and methods of the concern. Such experiments have helped create esprit-de-corps, but they naturally do not get very far in educating the men. There has been a growing conviction that the training effort should be well organized and systematic, requiring a definite line of study for the individual, in addition to an opportunity for group discussion.

A movement of this kind which has had gratifying success in the States and is now getting a good foothold in the Dominion is represented by the Course in Modern Production Methods given by the Business Training Corporation of New York. By means of especially prepared text material, written work, and lectures, the foremen are given a three months' intensive group training on the subjects of teamwork, handling men, organization, costs, control, and management. The reading of the text material provides the instruction in basic principles and the men apply these principles to concrete factory situation that are presented to them in the form of problems. Their solutions are forwarded to a central staff for comment and criticism and are discussed at the group meetings which occur bi-weekly. The instruction is simple and stimulating, and is tied up closely to the problems that confront the average foreman in discharging his daily duties.

Already over 25,000 foremen in 400 plants have gone through this course, the majority of them having done all their prescribed work to win their certificates. The results in some of the paper plants have been especially gratifying. A few instances might be cited to show the effect the training has upon the minds of the men.

In the case of a paper company in Kalamazoo, Michigan, a foreman who had left the trade was induced to return to assist in the shipping room. He was just completing the Course in Production Methods while the other foremen were starting with the course. As soon as he took up his position, he put a crew at work to open up the shipping department, which was blocked, and where they were not able to get the orders out. He found that by the use of a sharp knife in slicing the paper rolls he was able to save a large amount of "Broke" which had become so because of the use of the hook, which simply tore the paper off the roll with-

out giving an opportunity of saving any of it. The larger pieces thus saved were put into stock, the remainder being cut up as samples.

He had doors cut through the partitions of those parts of the plant which adjoined the shipping room, saving a great deal of unnecessary hauling and greatly facilitated the removal of the rolls to the shipping room. It had formerly been necessary to carry the rolls long distances because of a lack of a direct route to this room. With the cleaning up of the shipping, the operators of the Fourdrinier machines saw that they had been caught up with, and whereas before this was done the output per machine per day was 22,000 pounds, the first day after this stimulation the increase went to 56,000, the second day to 60,000, and the third day to 72,000, the average since being over 60,000 pounds. This was due, so their General Superintendent says, to the interest in the work of the course which had inspired the foremen to greater accomplishments in their respective positions.

There was also an additional saving in the amount of wires used for repair work on the machines, due to better attention paid to the work by the operators.

In the case of another large concern there had been a great loss on account of paper being processed incorrectly a long time before it had been discovered, when a little attention and watchfulness would have resulted in the finding of the error and earlier correction thereof. Employees here took the course, and the firm felt a great many times repaid because of the increased efficiency resulting.

There is a pulp and paper concern in Ohio which has been enabled to work out a system of charting the exact daily production, spoilage, and cost for each department through the initiative of the foremen themselves. As a result of the group meetings the foremen proposed to the management that these charts be started so that each man could watch the operations in his department closely with the view of bettering their individual records in production. The management had been keeping these records themselves for some time, but they now find that more rolls are coming through good and t ehunit cost has been reduced while the total output has been increased with a smaller employment than last year. They attribute these results to the interest taken by the foremen in their daily records and the new appreciation which the foremen have of overhead expense.

Scores of other instances might be cited, if further proof were needed that improved foremanship helps to better production standards. By getting all the keymen in the plant together, including some of the "white-collar" fellows in the office, and giving them an intensive study of production methods as applied to their own manufacturing problems, more teamwork and more economical operation should inevitably follow.

Some of the paper concerns appreciating benefits from such training are the American Writing Paper Company, Crocker Burbank Paper Company, Bird & Son, Mead Pulp & Paper Company, Falulah Paper Company, Robert Gair Company, Monarch Paper Company, Continental Paper Company, and Richardson Paper Company.

Slight damage was caused by fire in the Herald Building, Craig Street, Montreal, on Sunday evening, when flames broke out in several boxes of waste paper and rags in the shipping room in the rear portion of the third floor.

BRAZIL CANCELLING ORDERS IN THE UNITED STATES.

The steady rise in the value of the American dollar in Brazil on terms of milreis is causing increasing apprehension among Brazilian importers as well as among the American suppliers, who view with alarm the probability of large cancellations of merchandise arriving from the United States, according to Assistant Trade Commissioner R. M. Connell.

It has been claimed that the fundamental cause for the majority of the cancellations already suffered was late delivery by the American manufacturers, but further developments have proved that the prevailing exchange rates have been more influential in determining such action. Articles nominally paying ad valorem duties of 50 per cent have recently been assessed nearly as hight as 100 per cent, while in addition the Brazilian importer must pay almost twice as much in milreis for dollars to meet his obligations in the States as he had to pay a year ago.

Together with this distressing situation the buyers' action in cancelling American orders is undoubtedly influenced by the very low offers being by German exporters attempting to re-enter the Brazilian market, who it is reported are quoting prices on some articles 60 per cent below New York quotations and 65 per cent below London prices.

While it is doubtful if German exporters can deliver according to contract yet this is an additional disturbing element in the situation which some importers have to face.

PRICES OF GENERAL CHEMICALS

Current Wholesale Prices in New York Market, Week of February 23, 1921.

	Carlots	Less carlots
ACID, acetic, 28 per cent.—100 lbs.	3.00 — 3.25	3.50 — 3.75
" acetic, glacial 99½ per cent carboys—100 lbs.	10.50 —11.00	11.25 —11.50
" Hydrochloric—100 lbs.	1.60 — 1.75	1.85 — 2.25
" Sulphuric, 60 deg., Drums—ton	— —	14.00 —5.00
ALCOHOL, Ethyl—gal	— —	5.25 — 5.50
" Methyl (see methanol)	— —	— —
" dematured, 188 proof—gal.	— —	.54 — .57
ALUMINUM sulphate, commercial—lb.	.02¼— .02½	.02¾— .03
" sulphate iron, free—lb.	.03 — .03¼	.03½— .03¾
AMMONIUM chloride, granular (gray sal-amoniac)—lb.	.09 — .09¼	.09½— .10
BARIUM sulphate (precip.) (blanc fixe)—lb.	.04½— .05	.05½— .06
BLEACHING powder (see calc. hypochlorite	— —	— —
CALCIUM hypochlorite (bleach powder)—lb.	.02¾— .03	.03¼— .03½
CAUSTIC soda (see sodium hydoxide)	— —	— —
CHLORINE, gas, liquid-cylinders (100 lb.)—lb.	.09— .09½	.10 — .10½
GLYCERINE, C. P. drums extra—lb.	— —	.20 — .21
LEAD nitrate—lb.	— —	.15 — .20
LITHARGE—lb.	0.8¾ .09	.09½— .10
METHANOL, 95 per cent—gal.	— —	1.60 — 1.65
POTASSIUM of chromate—lb.	.14 — .14½	.14½— .15
POTASSIUM hydroxide (caustic potash —lb.	.12 — .12½	.13 — .13½
POTASSIUM prussiate, yellow—lb.	.28 — .29	.30 — .32
SALAMMONIAC (see ammonium chloride)	— —	— —
SALT cake—ton	— —	32.00 —33.00
SODA ash, light—100 lb.	2.10 — 2.20	2.25 — 2.40
SODA ash, dense—100 lb.	2.20 — 2.30	2.40 — 2.60
SODIUM borate (borax)—lb.	.08¼— .08½	.08¾— .09
SODIUM carbonate (sal soda)—100 lb.	2.00 — 2.25	2.50 — 2.75
SODIUM hydroxide (caustic soda)—100 lbs.	3.85 — 3.90	3.95 — 4.25
SODIUM prussiate, yellow—lb	.16¼— .16½	.16¾— .17
SULPHUR, crude—ton	16.00 —20.00	— —
SULPHUR dioxide, liquid, cylinders—lb.	.08 — .08¼	.08½— .09
ZINC oxide, XX—lb.	.08½— .09	.09½— .11

Beauty may be only skin deep, but it makes humanity stop and look. (Accent on "man".)

Recent Developments in Japan

The following is a special contribution to the Pulp and Paper Magazine and is inspired by frequent reports of wood pulp imports at the port of New York

According to advices coming from Japan, it appears that Japanese paper manufacturers are busying themselves in real earnest to develop and make accessible areas of wooded lands, hitherto untapped, from which they expect to procure a substantial part of their future pulpwood supply. Opinions of paper mill exterts, industrial leaders and others recently arrived in America from Japan bear out more or less the reports telling of such projected developments.

The paper industry of Japan, as is pretty well known, has been greatly taxed during the last two or three years meeting a tremendously increased demand for its product by foreign consumers, particularly in the Far East and in the Antipodes. Its export market has been extended so that Japan now supplies India, Australia, and New Zealand with millions of yen worth of Japanese paper and paper products annually, besides continuing as the chief exporter to China.

This enormously augmented export trade, not to mention the greatly increased domestic demand, has naturally called for immense supplies of paper-making materials. Now, Japan, of course, has not been able to produce even a small part of these raw materials, hence her paper manufacturers have had to obtain such supplies largely from foreign producers. But with the continually growing demand, leading Japanese paper makers have come to appreciate the sources, and while they have been giving every encouragement to the improvment of the manufacturing end of the industry, they are now turning also to the furtherance and promotion of projects which have to do with the reclaiming and tapping of pulpwood areas contiguous to, and within easy reach of the main Japanese islands.

The more important of these schemes center about the possible utilization of vast forest tracts in Manchuria and Saghalin Island. It is readily conceded that the proper development of these localities will call for the exertion of tremendous effort, particularly in Manchuria. And while the pulpwood yield from both sections is expected to keep Japanese mills supplied for years to come, speculation is even now being indulged in by paper men of Nippon concerning possible future developments in Siberia.

If Manchuria, Saghalin, Korea and other places in Japanese spheres of influence can really be made to yield a substantial part of the wood pulp needed by Japan's paper factories, it will follow that the pulp imports from other countries will fall off to a marked degree. But before this can happen, the Japanese will have to turn out a pulp which can compare favorably in quality with the pulp she now imports, notably the pulp from Canada. This latter is conceded by Japanese manufacturers themselves to have fibre qualities which they believe cannot be easily duplicated in any of their home made products. Most of the pulp now produced in Japan is very much like Scandinavian pulps.

Improvement in the manufacture of paper in Japan has been effected only in connection with the production of foreign papers, i.e.,—the paper made in Japan from foreign pulps. Speaking of the advance in this line, a recent report of the Japanese Department of Agriculture and Commerce says that machinery has been imported so that foreign paper is now produced on a large scale and is quite different from the production of the ordinary Japanese paper. Some of the kinds made are cardboard, printing paper, paper for match-boxes and renshi paper. The materials used are rags, wood fibre, rice-straw and other vegetable materials; of these, wood fibre, or pulp, is most extensively used.

The manufacture of paper known as Japanese paper, which since ages ago was carried on mainly as a secondary occupation by farmers, continues pretty much after the primitive fashion. It is still to a large extent the result of manual labor, though some few of the more enterprising paper makers have of late been applying labor-saving devices. The material for the manufacture of this paper is paper mulberry, called "mitsumata," and straw, called "hishihana." As ink smears on the Japanese papers, they cannot be utilized for printing, consquently the demand for them is very limited.

The quantity of Japanese paper produced is more than sufficient for consumption in Japan, and there is a tendency towards increase in its exportation. Foreign paper—especially printing paper—on the contrary, is not produced in sufficient quantity for home use. The year prior to the war 26,446,281 pounds were imported by the trade in Japan, which was about one-fifth of the total quantity she produced. During the war the imports fell off greatly, but in 1918 they had again mounted to two-thirds of the pre-war figure, and in the succeeding year the ante-bellum mark was just about equalled.

An idea of the Japanese paper industry's present extent may be formed by reference to the latest available figures compiled by an official industrial bureau in Tokio. According to these, the yearly production of the paper mills throughout Japan is roughly given as 168,700 tons, the value of which is 54,000,000 yen. Of this output, 80,000 tons are used for newspapers, 16,000 tons for the printing of magazines, 7,000 tons for the printing of primary school text books, 20,000 for the printing of middle school text books, 3,000 tons for the manufacture of blank-books, 15,000 tons are used by the Government Monopoly Bureau for cigarettes, 3,000 tons for postcards, 7,000 tons for match-paper, and 17,000 tons for wrapping and packing. The quantity required in the printing of newspapers and magazines takes 62 per cent. of the total production. Japan also uses much for the manufacture of paper boxes, cans and lacquered boxes and trays, which are exported by the millions of yen to America and Europe.

The last report of the Forestry Bureau of the Japanese Department of Agriculture and Commerce on pulp production in Japan shows a great increase in such production during the four years from 1915 to 1919. The total production in 1919 was 235,227 tons, an increase of 40 per cent. over 1915 and three times the total amount for 1911. Up to the year 1919, fifteen wood pulp manufacturing companies had been established, and twenty-nine plants were in operation in various parts of Japan. The quantity of wood used by these plants in 1919 amounted to 3,389,630 koku (one koku being 10 c. f.). The increase in production

was accelerated largely by the expansion of Japan's paper manufacturing business. Saghalin and Hokkaido experienced the greatest growth in the pulp wood cutting industry.

Experts in the Forestry Bureau believe that Japan's future annual consumption of wood will go as high as 6,000,000 koku, or approximately three times the present figure. Production figures for 1919 show that Japan proper turned out 207,960 koku; Saghalin, 1,382,731 koku, while 1,746,902 koku was produced from wood cut in Hokkaido. The quantity produced in Saghalin that year jumped forty-one times over the total amount produced in 1913.

As it is definitely known that the suppy in Hokkaido is by no means inexhaustible, the various paper manufacturing companies are looking further afield for their future supply. The Oji Paper Manufacturing Company and some others are experiencing a shortage of material, and they have already undertaken the exploration of forests in Saghalin and Northern Korea with a view to surveying the possibilities of pulp manufacture there. Saghalin, it is expected, can be made to yield at least three times it present supply within the next few years.

Manchuria, because of her wealth in natural resources, is being made to figure quite extensively in the plans and projects having to do with the development of future sources of supply for the Japanese paper industry. Being bounteously endowed for forestry pursuits, especially in the untapped hinterlands, the vast area of Manchuria—and parts of Korea and Mongolia as well—afford a boundless field for large scale timber, pulp and woodland operations. While a good part of South Manchuria is level and destitute of trees—due principally to neglect by Chinese authorities in afforestation work—in the basin of the Yalu River the forest area is estimated at 715 square miles, and in its tributary, the Hun, no less than 480 square miles are covered by densely wooded regions. The trees in Manchuria are mostly pine and cypress—the pines being largely Korean pine which is a tree very similar to Oregon pine.

Nearly half of North Manchuria is wooded land, the forests along the Changpai and Hsingan Mountains being particularly rich. Forests convenient to present transportation routes have been sadly depleted, but those in the remote regions are flourishing as ever.

Until now, the supply of timber, sawed lumber and pulpwood obtained from Manchuria has come mostly from the Antung district along the Yalu. Estimates furnished to the United States Consular agent in the Antung district, place the number of men engaged in the Yalu timber trade at 65,000, of which 60,000 are employed in cutting and rafting logs and 5,000 as teamsters. The teamsters and their teams are hired for the cutting season, while raftsmen are paid an average annual wage of $70, plus food and lodging.

The yearly output of lumber is dependent upon weather, a plentiful snowfall in winter facilitating the "snaking" of logs to creeks, while high water in spring and summer is necessary for rafting timber from the upper stretches of the Yalu and Hun Rivers to Antung. Early thawing of dragroads results in thousands of feet of timber being left in the cutting district. It was this which caused the Antung market shortage in 1919. The customs export statistics are not a true index of the Antung timber industry, as the only exports considered are those made in foreign-style vessels. An enormous export traffic in timber, shipped by native junks, comes under the cognizance of native customs, but does not furnish statistics.

While there were only two saw-mills in Antung in 1912, the number had increased to twenty in 1918. Several paper and pulp mills were erected during the same period (1912-18). One of the largest of these—the plant of the Yalu Paper Mill—was completed in recent months. This firm—a Japanese concern, capitalized at $2,500,000—is equipped with machinery capable of turning out annually 50,000 tons of paper pulp from Yalu timber.

The Yalu and Hun river regions, however, can supply timber and pulp wood cut for a time only, so Japanese pulp manufacturers and paper men have already surveyed the possibilities in the section of Manchuria lying to the south and east of the Kiren-Changchau railroad, and they have also looked over the region of the big watershed situated midway between this point and the Korea-Manchuria boundary. The vast forests covering the slopes of the Changpai-Hsingan mountains are in this great untapped territory. If this region can be made accessible a well-nigh inexhaustible supply of wood and timber will be opened up to industries depending upon such material.

Plans and projects for the opening of these resources have engaged the attention of Japanese industrial men for some time past. Paper, pulp and timber men are not the only interests concerned in the development of the resources of these localities. Much benefit is bound to accrue also to other enterprises, particularly to the cultivators of the soya bean, which, it is said, could be extensively grown in the section about Taou, which is situated some miles to the east of the South Manchuria Railway at a midway point on that line.

But plans such as these, before they can be undertaken at all, must be assured convenient transportation facilities. These are sadly lacking. However, Japan's industrial captains, those of them who can see large possible gains in the development of these hitherto untouched expanses, have for several years urged the extension and construction of the rail lines needed to make possible the exploitation of the unopened regions. The country is well within the sphere of Japanese influence, and the necessary routes might have been constructed before now had it not been for unsettled conditions due, first to the World War, and more lately to the instability of the Chinese Government, which government must, of course, be considered in any project involving Manchuria outside the peninsula over which Japan exercises direct control.

The present outlook, however, justifies Japanese paper men in their belief that something definite will be done in the near future to extend the rail lines. It is believed that appropriations for that purpose will be forthcoming whenever the present unsettled condition of international affairs may show signs of clearing. The South Manchuria Railway can be counted upon to co-operate in every way possible to help open these lines.

One of the most talked of projects is a connecting link between Kiren and the coast of North Korea. This extension may be undertaken by the Chinese General Railways, or it may be advanced by other interests, but whoever builds it, either now or within a year or two, will find that the Japanese engineers are prepared to be on hand to construct it in accordance with ready-made plans and specifications.

Some idea of the present situation in Manchuria, and the attitude of the Tokio Government toward the

development of its resources, made be had from a statement made last week in New York City by Viscount K. Inouye, who arrived March 4 from Japan to study American railways and "to invite Americans to cooperate in the development of the vast resources of Manchuria." Dr. Inouye, who is a member of the House of Peers in Japan, a director of the South Manchuria Railway, and a supervisor of the Fushun Colliery and Anshau Steel Works, denies emphatically that Japan is trying to monopolize the wealth of Manchuria. Manchuria's door is wide open, insists Dr. Inouye. There is no reason, he says, to exclude any nation, for it is the international field of commercial activity of the Far East, and offers equal opportunity to all. The co-operation of the United States is not only invited, but very much desired. Manchuria's development is still in its infancy, says Dr. Inouye. Since the surface of the country has not yet been scratched, and its vast resources are practically untouched, it would not be possible, he contends, for Japan alone to exploit this territory to its full extent.

While it has been shown in the course of this article that the production of wood pulp in Japan is bound to grow—even if the possibilities in Manchuria are not taken into consideration—the increased needs of Japanese manufacturers will not result in preventing a certain amount of ordinary Japanese pulp from being exported. Some such exportation will continue while it is so much more profitable for Japanese manufacturers to import special pulp from abroad. The amount of such exporting has averaged about 3,800 tons annually for a number of years.

During 1920, despite the growing demand in Japan, the pulp exports ran somewhat higher. This increase was due mainly to re-exports of foreign pulp. This pulp came from surplus stock—mostly Scandinavian pulp—which Japanese paper merchants had on their hands in warehouses. Because of the greatly increased demand for Japanese paper and paper products during the past year or two, importers of foreign pulp in Japan stored up a large supply of the raw material. Many of them found themselves stuck with this stock along about the middle of last year when Japan, like many other countries, experienced a period of depression in business, combined with a serious money stringency. And their troubles were further aggravated by a shortage in warehouse space which reached an acute stage in Japan last year. In consequence, the concerns which usually import pulp made every possible effort to dispose of what stores they had, and they hoped they might relieve somewhat the tight situation they were in by exporting whatever they could of their previously imported material.

Application for export permits were filed with the Tokio Government to an extent that naturally lent color to the belief that a large volume of actual exports would be undertaken. This, however, did not eventuate, considering that there was nothing in such trade for the exporting merchants except a chance to retrieve, in part only, the losses they faced through having the large stores of pulp on their hands. Another drawback to such exporting was the price factor—the drop in prices below the charge per ton to Japanese merchants when they originally bought the pulp. Present indications are that pulp exports from Japan are tending back to practically the same level as before the war.

PRIZES AWARDED FOR STUDENT ESSAYS.

The judges appointed by the late Chairman of the Technical Section, Mr. L. H. Shipman, to read the essays submitted by students placed last summer in the mills, were Messrs. R. A. McInnis, George Carruthers, and J. N. Stephenson. After considering the essays which were entered in the competititon arranged by the Technical Section, they have selected as first prize the essay submitted by Mr. A. B. Copping; second prize to that submitted by Mr. C. M. Croft; third pride the essay submitted by Mr. D. H. McFarlane.

The first two mentioned are student members of the Technical Section and all three essays are of a very high order.

A complete list with names is submitted herewith. The judges report that they were more than delighted at the obvious care which has been expended on the preparation of these essays.

The Executive of the Technical Section under the chairmanship of Mr. George Carruthers is again arranging this year to place students in the principal mills of the Association and is prepared to repeat their offer of last year of prizes for the best essay submitted for the competition.

Following are writers and titles of essays submitted by students for the Technical Section prizes:

J. O. Challenger: "Manufacture of Sulphite Pulp."
C. S. Jelly: "My Summer's Work in a Pulp and Paper Mill."
C. D. Goodwin: "The Manufacture of Kraft or Sulphate Paper."
H. F. Beaupré: "The Manufacture of Sulphite Pulp."
Ronald File: "My Summer's Work in a Paper Mill."
A. Johnson: "The Manufacture of Groundwood Pulp."
A. B. Copping: "Investigations of a Technical Service Department."
J. O'Halloran: "My Summer's work in a Pulp and Paper Mill."
E. Prevost: "A Study on Pile Driving."
C. M. Croft: "My Summer's Work in a Pulp and Paper Mill."
F. E. Shackell: "My Summer's Work in a Pulp and Paper Mill."
A. Brosseau: "The Story of a Sheet of Newsprint."
D. H. McFarlane:: "My Summer's Work in a Pulp and Paper Mill."
E. D. Hyndman: "The Manufacture of Sulphite Pulp."

BRITISH TRADE NEWS.

Office Boy to Director.

Mr. F. Brown, of Blackburn, was on January 26, appointed a director of the Sun Paper Mill, at Feniscowles. Mr. Brown, who has carried out the secretarial duties of the mill for many years, commenced work at the Sun over 30 years ago as an office boy. A native of Blackburn, he has received congratulations from his numerous friends in the pulp and paper industries over his well-earned promotion.

You may succeed when others do not believe in you, when everybody else denounces you, but never when you do not believe in yourself.

We wish to thank most heartily, those who have sent us their spare copies of the issue for January 20th. We are pleased to announce that the required number have now been received.

Sleeping Giant of Thunder Bay

By JOHN W. BRASSINGTON, Chief Engineer of Pulp and Paper Machinery Department of Port Arthur Shipbuilding Co., Limited, Port Arthur, Ontario.

Now when the Pulp and Paper Industry of the great Northwest is following some fundamental law of progress and is pushing irresistibly towards this port of entry and distribution, it requires but a slight stretch of imagination to see the first signs of waking vigor in the Sleeping Giant.

He lies recumbent, his sphinx-like head looking ever upwards; the arms are folded on the massive chest, the long limbs outstretched in his age long slumber. He is fashioned of the primordial stuff that builds the eternal hills, and his latent power compels the vision of the newcomer to Port Arthur.

In the distant centre of a widespread water scene I have seen him flecked with the riotously rich colors of the sunrise, as their chromatic outposts scaled his purple sides, while the deep blues and bright greens of Thunder Bay reflected the mounting splendors of the coming day.



The Sleeping Giant.

I have seen his massive form more clearly accentuated by the snow that Nature dusted with lavish hand on this unique example of her wayward fancy; white corpuscles of promise that prophesy his awakening. Already in the past few years the red corpuscles of human faith and energy have builded the twin cities of Port Arthur and Fort William; a few years that are as the melting of a snow flake in the long period he has been dreaming there. Yet, short as these few years have been, they are surely the premonitory signs of the great awakening, the travail pains of some mighty birth of time of which he is the sign and token, that strong, silent sleeper of titanic form and massive strength.

Grain from a continent, vast stores of it from the wheat fields of Canada, flow to the grain elevators of the Twin Cities that have this somnolent guardian as their eternal symbol of colossal strength.

As an illustration of what is actually happening around Port Arthur and making it the distributing point for pulp and paper production of central Canada, the following pulp and paper mills have started in the Twin Cities within the last two years in order to avail themselves of the facilities offered by Port Arthur as a central distributing point for their product,

Provincial Paper Mills, Ltd., Port Arthur Branch, Port Arthur, Ont.

Kaministiquia Pulp & Paper Co., Ltd., Port Arthur, Ont.

Fort William Pulp & Paper Co.; Ltd., Fort William, Ont.

Nipigon Fibre and Paper Mills, Ltd., Nipigon.

The tremendous demand made on Canada for wood pulp and "News" by the United States will undoubtedly in the near future be the incentive for further pulp and paper industries to start in this country, where the supply of pulpwood is very extensive and where facilities as a receiving point for the logs, and a distributing point for the finished pulp are offered by the great inland port of the North American continent.

This phase of development of Port Arthur as the great Canadian lake port is now only premonitory; it is, nevertheless, as great in its grip on the imagination as the magnificent figure of the Sleeping Giant lying outside the port itself.

We have named only four paper industries because they are the recent comers in our Twin Cities, but there are over thirty large paper industries, some of them amongst the largest in the world, in the Province of Ontario alone.

With a coming free egress to the sea, via the St. St. Lawrence River, the ever growing importance of Port Arthur as the great inland port of the new world fills the mind of the observer, as the giant effigy of the North American Indian sleeping out yonder so vivid and life-like, fills his vision.

RATIO OF PAPER STOCKS TO PRODUCTION.

Comparing the stocks on hand at the domestic mills on January 31, with their average daily production based upon the combined production for 1918, 1919, and 1920, the figures of the Federal Trade Commission show that:

Newsprint paper mill stocks equal 7 days' average output.

Book paper mill stocks equal 9 days' average output.

Paper Board mill stocks equal about 9 days' average output.

Wrapping paper mill stocks equal about 19 days' average output.

Bag paper mill stocks equal about 6 days' average output.

Fine paper mill stocks equal about 29 days' average output.

Tissue paper mill stocks equal 18 days' average output.

Hanging paper mill stocks equal slightly more than 16 days' average output.

Felts and building paper mill stocks equal 13 days' average output.

Miscellaneous paper mill stocks equal slightly more than 21 days' average output.

Total paper mill stocks of all grades equal about 12 days' average output.

While production decreased for all grades during January, some departments show an increase compared with those prior to the abnormal record for 1920 and the totals for January 1921, 1920, 1919 and 1918, were: 420,468; 650,293; 466,236; 491,010. Hanging suffered the least, newsprint next.

Transactions of the Technical Section

(A continuation of the Report of the Annual Meeting, Jan. 19 & 20, 1921.

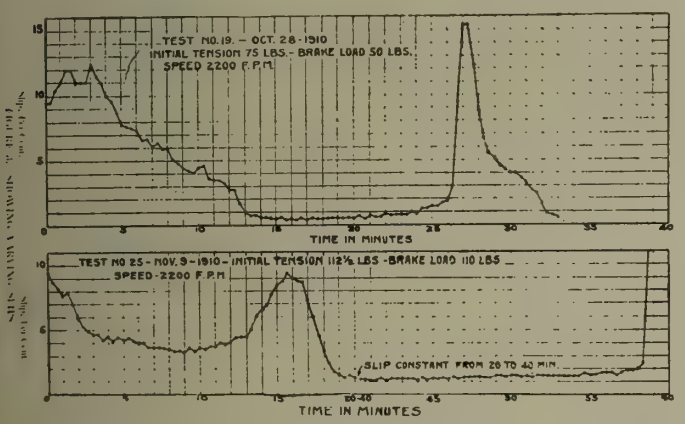
Speed Inter-lock as Applied to Paper Machine Drives.

At the conclusion of his paper, which appeared in the Pulp and Paper Magazine for Jan. 20, Mr. Warburton added:

I have come to the conclusion that in order to deal fully with the subject of sectionalized driving one would require to write—not a paper, but a book. There are many interesting phases of sectionalized driving which I have not even mentioned as yet which you may wish to consider and discuss, and if I have not taken up too much of your time already I would like to throw forward a few thoughts which may bring forth interesting discussion.

A well-known engineer (connected with a firm of machine builders) told me some little time ago that he did not consider a high speed news machine would be a paying proposition, because the horsepower taken for driving high-speed machines must be in proportion to the square of the speed.

Let me say at once—I am not contributing hereby to your fascinating subject—Speed vs. Width. The same remark would appear largely common to both types. Fundamentally, I suppose the man quoted is right because the wire is longer on high speed machines —more suction boxes—more presses—heavier presses, at least twice, and may be three times the weight of dryers, collectively these mean approximately double power demand per unit of speed as compared with an ordinary machine; nearly one thousand horse-power



A graphic picture of belt slip.

has been indicated in practice on mechanically driven machines running at nearly one thousand feet.

The new mammoth Laurentide machine at six hundred feet takes 1.26 motor brake horse power per inch of width.

From data collected of single motor drive machines it would appear that the average horsepower of a news machine mechanically driven at six hundred feet per minute is about 1.97 brake horsepower per inch of width.

The mammoth machine **actually takes less power per inch of width than the average small machine.** Taking weight of machines into consideration, we find the average mechanically driven machine takes approximately three times as much power per inch of width as the Laurentide machine.

The power-cost bogey has had its sting withdrawn by a combination of good workmanship and design combined with sectionalized driving; these two factors are combined together, and cannot be separated, so, we cannot have the pleasure of knowing precisely how much to attribute to one and how much to the other. The results, however, are little short of staggering.

Another interesting feature which claims attention in connection with the starting up of a high speed news machine, is the enormous torque required to start the dryers turning. At Laurentide the torque required was equivalent to one thousand horsepower torque; the running load of the dryers at seven hundred feet as low as forty horsepower. That is to say, the starting load is no less than fourteen times as much as the estimated running load at one thousand feet. This starting torque worked out gives co-efficient of friction at start as that generally used for metal on metal dry, and there is evidently no oil at starting to help. All oil has been cleared away by a combination of pressure and temperature. A mixture of oil and graphite might help the starting conditions.

Smaller machines would appear from calculation not to have such fierce starting torque as compared with running torque.

Another interesting feature was when the dryers are turning round very slowly they have torque equivalent to five hundred and fifty horsepower, which appear to show that the oil does not get fully into the journals until the speed rises to some reasonable figure.

If I had been reading this paper in England instead of in Canada, I need hardly say one of my prime duties would have been to deal with steam engines first, but over here one is apt to take motors for granted. Here you are so spoiled by nature that you can, with reason, talk of electricity as a means of raising steam.

Friction clutches and all their attendant troubles are avoided by sectionalized driving. I wonder what form of friction clutch would have started the Laurentide dryers.

I think we shall be able to show that shut downs are less frequent—fire and life hazards are certainly less. Ease of control by push bottons to inch the dryers or the press rolls when washing felts are things that require to be experienced to be realized.

Those gentlemen who would have a basement, at any rate can have the basement for whatever purpose they like because it is free from any drive entanglements.

Vertical belts, we know, are bad. They are eliminated.

Cleanliness is at its maximum.

In the case of a jam at the calenders there is a button available to reverse the calenders instead of having to use violent mechanical instruments, e.g. pinchbars, to get the rolls turned round.

It is suggested that you may be able to use less sulphite and so save running costs thereby.

In conclusion I would just like to say that sectionalized drives are equally applicable, to book machines as to news, to tissue machines as to kraft, and that the demand for sectionalized drives did not arise from high speed news machines, because sectionalized drives were in demand years before high speed news machines were thought of, certainly before they were talked of.

MR. BRASSINGTON: I want to ask Mr. Warburton

whether the electrical drive is sufficiently economical to consider replacing mechanical drives in existence. I have no doubt in my mind whatsoever that electrical drives with the Harland interlock system are efficient in every respect. I do not think the point is quite covered that a change in speed has to occur before the correction is made. The sectional drive permits a reversing arrangement and does away with the clutch and the tremendous torque upon it. I do not want to give the impression that I am going after the electrical drives in any sense, but on the old mechanical drives the amount of trouble was really not so very great, and your engines were really reducing valves. You got your power from your steam before you used it in the drying cylinders and it is possible that power is not the first consideration of the paper mill, because there are some things which are more important than the loss of any amount of power. For instance, you can lose a great deal of money if you allow the broke to pile up.

I would like to ask Mr. Warburton, "If you have a paper mill where you have already installed an ordinary engine drive, the amount of broke is comparatively small, and the mill is running in good shape, would it pay to pull it out and install the electrical drives?"

MR. WARBURTON: I don't know. It would depend on conditions.

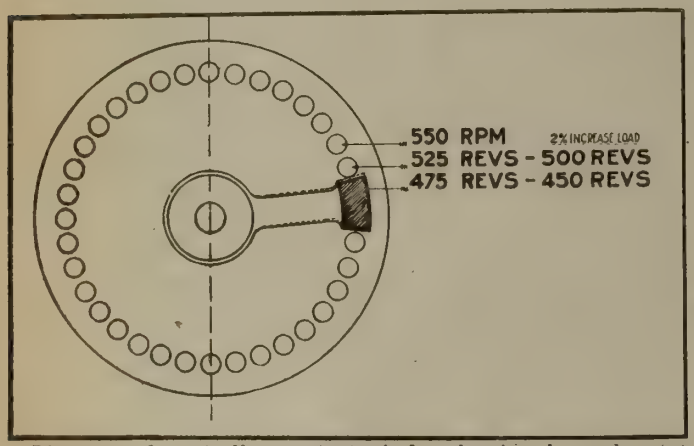


Diagram of controller contact circle, showing how rheostat arm "breathes" against the higher speed contact if there is a tendency for the motor to lag.

MR. BRASSINGTON: I would like to know whether you have any data or records showing the amount of saving that could be made in broke by putting in a sectionalized electrical drive, as compared with the old mechanical drive.

MR. WARBURTON: All I can say in connection with that is to refer to the figures on power consumption just given.

You may analyze a mechanically driven machine, calculate three per cent. loss in the belts, you may calculate bearing friction and make it three per cent. for each bearing, and you will get results very different from practice as shown by taking out the mechanical drives and putting in electrical drives. A great deal of power is consumed in a mechanical drive that is apart from any such figures arrived at, maybe the cone pulleys account for a lot of the difference.

Apart from paper machines altogether, my experience has been that in every case of electrification the saving by means of putting in motors and taking out all sorts of drives, is more than you can cal calculate theoretically.

Mr. WARBURTON said in reply to a question as to power delivered to the machine by a sectional drive and by mechanical transmission: On machines which I have analyzed giving an average of 1.97 B.H.P. per inch of width at 600 feet, some of the machines are in England, some of them in other countries. It is easy to get readings where electrical drives are in operation from paper machines analyzed to bring in those figures, that is the figure, 1.97 on the machines which were driven in an ordinary mechanical way with belts, gears, ropes and things, but in every case the machine was driven by one motor, and I have taken the brake horsepower of that particular motor, as compared with the collective brake horsepower of the Laurentide machine.

MR. MERRILL: (General Electric Company, Schenectady): It would be interesting to know the powers of these motors and the speeds, and also the number of sections to these machines.

MR. WARBURTON: There are nine sections and nine motors. Some run at 250 r.p.m. some at 500 r.p.m. The couch motor is 125 horsepower; each press, ninety horsepower; three sections of dryers, one hundred and twenty-five horsepower each; calender, one hundred and fifty horsepower.

MR. MERRILL: I wish to congratulate the Association on the paper Mr. Warburton has given us. Certainly, I think the arguments that he has set forth for sectionalized drives, particularly for new machines, is well worth the time and energy he has given to it.

MR. LEEPER: I would like to know about the gap arcing on the rheostat between the contact points on the rheostats.

MR. WARBURTON: As a matter of fact, we feared a little arcing in between the contacts and left about one-half the space of the contact itself, as gap. There is no arcing visible and in future installations the gap will be made less, as we do not fear sparking in any way.

MR. LEEPER: Personally, it looks similar to the regulator in use for many years. I feel that if you made speed changes on a section motor continually and rapidly you would have serious arcing at the contacts. It might not show up at once, but in time they would become so rough that you would not get any contact. I should think these would not last much more than a year of continuous service, and what I was after is how that arcing could be kept down.

MR. WARBURTON: We have not had a very long experience with the Laurentide machines, that is obvious. It is only a matter of weeks, but certainly there is no visible depreciation of contacts as yet. In the case of the other machine mentioned, which has been running for six years, we were called upon last year, for the first time, for contact renewals.

MR. LEEPER: The statement was made that for slow speed machines, gearing was preferable. According to quotations submitted on various sectional drives today with machines equipped with direct connected motors or with gear drives, there was a very little difference in the first cost. Now, why is the gear drive preferable if the cost is no different? It introduces another possible source of trouble in additional bearing requirements, and if the cost is the same, or practically the same, I cannot quite see the advantage of one over the other.

MR. WARBURTON: It is sometimes advantageous with a gear drive to change the gear ratio and so keep standard armatures for the different sections, but apart from this if the combined efficiency of gear and motor is not better than the slow speed motor there would appear to be no special benefit in using a gear drive

as compared with direct connected motors. I have no personal preference at all.

MR. H. L. SANDMAN asked if the calender could be shut down and allow broke to be made between the dryers and the calender. He wanted to know if in shutting down the calenders the regulators would be out of circuit on the calender or on all the sections and would the rheostat continue to turn round on the section shut down.

MR. WARBURTON: At Laurentide a solenoid clutch was provided between the master shaft and the spur shaft in connection with the calender regulator and so arranged that directly the spur shaft driven by the motor shut down stops, the other spur shaft would be disengaged from the master shaft and so the regulator arm on the calender would remain stationary. As a matter of fact the Laurentide Company actually never installed this solenoid arrangement as they, along with us, considered the matter met completely by the construction. The brush arm is designed to run over the contacts. Actually I have had on test one arm which made 3,000 r. p. m. without damage.

MR. SANDMAN: Have you no fear that the friction action may spoil your tension? I mean the spring tension might become less in operation.

MR. WARBURTON: The mechanism is comparable to a direct current motor and its brush gear. Only, in this case, instead of the commutator revolving, the brush revolves, and the spring actuating on the brush is comparable to that on ordinary D C motor.

MR. WARBURTON said, in reply to MR. CUSHING's question as to the effect of temperature on control when starting from cold:

I think one of the main troubles of sectionalised drives in the past before the advent of any control was speed variation due to temperature conditions as much as to anything else.

With the motors controlled as described the motors will run in exact harmony with the master shaft regardless of any change of temperature conditions of rheostats or of motors themselves. The regulator in each case will automatically correct every variation in temperature of any part of the plant, and regardless of temperature variation will keep every motor in synchronism with the master shaft.

MR. H. S. TAYLOR: I would like to ask Mr. Warburton how the master shaft is driven? Is that driven by driving motors or from a separate motor?

MR. WARBURTON: Sometimes it is a matter of opinion, almost as much as anything else. Sometimes this shaft is driven by a dryer motor. Some people prefer the couch motor to drive that shaft, in other cases an independent master motor of two or three horse power may be used to drive it.

MR. TAYLOR: If the master shaft were stopped, would that shut down the machine?

MR. WARBURTON: No. The motors would continue running at a steady speed, approximately equal to the last controlled speed. The brushes on the regulator would revolve but electrically would be out of action, and so the regulator brush arm position would no longer have any effect on a motor.

THE CHAIRMAN: I see some representatives of the Laurentide here. They have the credit for the installation of the first news machine of Canadian manufacture. It is just possible they might wish to contribute something to this discussion.

MR. MASON: We would be glad to give any information a little later, when we have our second machine in operation, and we would be glad to welcome any of you to Grand Mere to see the machines. I would be glad to answer any questions.

MR. WARDLE: I might just add a word to what Mr. Mason has said, that we now have the opportunity of getting the long desired information as to what the different parts of a machine will require at various speeds and different loads, and will make the most of it, and we promise that the Technical Section will get the result of our experiments pretty soon.

MR. S. N. STAEGE: (Westinghouse Electric and Manufacturing Company): I think Mr. Warburton has contributed a great deal of useful information on the subject. The information with respect to belt slipping on cone pulleys is something which we all should consider. I question whether paper manufacturers in general, or even engineers, have fully appreciated the amount of trouble which results from belt slippage on that kind of pulley in the old mechanical system.

Well, as has already been pointed out, the trouble does not always show up at the place where it originates. The variations in speed between sections and between the couch and the first press, or between any of two presses or between the presses and the dryers may so weaken the sheet, that it may break between the dryers and the calenders or may break going over the printing press later on.

Now in regard to sectional drives which will produce a uniform speed, there is no more tendency for paper to break at a thousand feet than at five hundred. It is a question of how fast you can form a sheet, dry it, and tend to other things outside of the actual drive itself.

The question was raised a little while ago, as to whether it was advisable or permissable to take out the existing mechanical drive and instal a sectional drive. In our practice, we have found that the power is greatly reduced in the use of sectional drives, and I suppose, corresponds very favorably with the figures presented by Mr. Warburton, and I feel safe in saying that in paper machines we consider sectional individual motor drives as compared to the mechanical system of drives, particularly the Marshall train drives—will effect a saving of at least twenty-five per cent, and it may go as high as fifty per cent, depending on the conditions and the type of drives.

Now, power, of course, is an item, and it has been mentioned that the engine is usually operated as a reducing valve; the exhaust steam being used for drying paper. However, if electric power is used for paper machines, and normally you would use five hundred horsepower on the machine, and you now find you can drive the machine with two hundred and fifty horsepower, you can still develop five hundred horsepower, use the exhaust steam for drying, you need that much, and use the balance of power for driving beaters or anything else throughout the mill. So, if you do not require the full amount of power on the paper machines, it can be used elsewhere.

Whereas there is a large saving in the mill on the power required to drive a paper machine, where sectional drive is used, I believe that the biggest saving resulting to the paper mill is the reduction of lost production. I believe that will run into more money than cutting in two the power which drives the paper machines, because we know that production runs into money pretty fast and if you are making two per cent of broke and you can cut that in half—although you cannot eliminate that entirely—your pay roll is no

greater and the investment charges on your plant are no greater, and the only increase you are putting into the increase of production is the raw materials, and what you get over and above the cost of that raw material for that greater out-put is "velvet". For instance, if you can increase your production one per cent, it will pay the fixed charges on a pretty big investment under sectionalized drives.

Just speaking in round figures, suppose you would throw out your mechanical drive, and put in a sectional drive, regardless of the size of the machine. Suppose that new model would cost a hundred thousand dollars. — remember I am just giving you rough figures—supposing you say that the interest and depreciation charges against that should be ten per cent, or ten thousand dollars a year, amounting to three hundred to four hundred dollars a day, how much increase in production would you have to make to discount that and put something on the profit side? This is quite typical.

Slow speed machines, like cylinder board machines, operate from perhaps a few feet per minute up to two hundred feet, with the motor speed regulated to an intake shaft from a few revolutions up to five or ten or fifteen revolutions. I believe that the slow speed motor would cost more money than the high speed motor with the reduction gear, and, further than that where a high-speed motor is used with reduction gear ventilation problems do not occur, whereas if you use a motor at this extremely low speed, it would be absolutely essential to use a forced ventilation system. Outside of the fact of these differences involved, there is a difference in efficiency, but, there is no reason why a slow speed motor cannot be applied to slow-speed machinery. However, I believe that the efficiency of the slow-speed motor will be less than the high-speed motor plus gears. Not only that, but the slow-speed motor will be heavier to handle, and occupy more space, which are obvious disadvantages.

These are a few of the points which, in my opinion, seem to favor the high-speed motor with the gear reduction as against the slow-speed motor.

Certainly a sectionalized motor drive for paper machines can be made more flexible than the mechanical drives. You can start and stop it as rapidly as you please, jog along and move it an inch or two at a time, and you know the enormous strains encountered and the time lost in striking in the clutches, and the wear and tear is extreme. I know that in some of the high speed machines, with mechanical drives a special reducing gear is required to start the dryers, because it is impossible to start them otherwise; the clutch would not hold, and you have to start with a low gear, and later on shift into a higher gear, after they are in motion.

I think the question of very high starting torque is one that requires a good deal of attention, and that by carefully getting after the mechanical designs when the conditions are known, this can be greatly reduced in a news machine just starting up but perhaps the opportunity has not been afforded for thoroughly analyzing the mechanical conditions.

There is no question but what the basement can be eliminated so far as the drive is concerned, because no part of it goes into the basement and considerable difference can be made in the width of the paper machine room alone. We have found, in analyzing several cases, that from ten to fifteen or twenty feet narrower machine rooms could be effected by using sectional drives than is absolutely necessary with the mechanical system of drives, and the reliability, in my opinion, is far greater as regards the control of the motors, and they can be operated for years with practically no maintenance other than renewals of brushes, which is only a matter of a few cents or dollars, and can be relied upon to operate every minute of the twenty-four hours six or seven days a week, year after year, whereas, with the mechanical system of drive, nearly every mill has a basement full of extra gears, clutches, pulleys, belts and so on, and one man is constantly working repairing the parts and making renewals. There are so many of these advantages in sectional drives, which Mr. Warburton has touched upon and analyzed more or less particularly, and which can be explained individually, that I believe every one of us can well afford to investigate further.

MR. STEPHENSON: At this time I think we are particularly fortunate in having this paper presented to the Technical Section, for two reasons: one is, that we have had a description of the operation of the first sectionalized driving that has been introduced in Canada, and this has been attached, as Mr. Carruthers has said, to the first news machine built in Canada. The beginning of the operation of this machine, and the recent beginning of the operation of a machine on fine papers, represents the entry of Canadian manufacturers into a field of endeavor which holds great promise for Canada as a manufacturing country, and Canadians, I think, have reason to be proud of the manner in which we have found that these machines are behaving. It means a period of development in machine construction in Canada that some of our concerns have been aiming at for some time and with the absolutely certain growth that must come in the pulp and paper industry in Canada, the corresponding or complementary development of the construction of machinery for our industry, is something which is certainly to be desired, and something of which we have every reason to be proud. We have concerns in Canada now that can manufacture practically—if not entirely—everything that the pulp and paper mills reqire in the way of machinery, and we have the mother country—in this instance, at any rate—supplying the motive power that is driving the finest piece of workmanship in the paper machines that we have, and it is a great pleasure to me to move a vote of thanks to Mr. Warburton, for the excellent way in which he has brought this matter to our attention.

MR. ROSSITER seconded the motion, which was carried unanimously.

(The discussions of papers will be continued.)

GERMANY'S PAPER TRADE.

I have just had a look at the "Bulletin" of the Federation of British Industries, which includes nearly all the paper mill owners of reputs, and other industries, and in commenting on the German paper trade it is stated that it is very satisfactory. Selling prices are so high that producers of paper are enabled to use American coal, which has been impossible for other industries in view of the exchange position of the dollar. Then again the home demand for paper can be supplied and efforts are now being made to obtain permission to export 500 tons a month. Such exportation would naturally yield very high profits owing to the prices prevailing outside Germany, the low cost of production and the low level of the mark. From this account the Germans are getting over the coal question. It will be recollected that under the peace terms France was to get a big share of coal each month to make up for what had been destroyed during the war.—J.R.B.

British Trade News

(From our London Correspondent)

London, Feb., 21, 1921.

The Paper Makers' Association of Great Britain and Ireland has made a change in the date on which the annual dinner will be held. It is put back to April 15 and will conclude an interesting week's meetings and conferences, most of which will be of a private character. Unfortunately the President (Mr. W. L. Tod) is at present unwell and has had to cancel some of his engagements.

Technical Section.

The various branches of the Technical Section of the Paper Makers' Association are progressing very favorably, and from a technological point are instructive and interesting. What is more pleasing is the fact that mill men are giving much attention to the Section and now that they have got a "move" on big things are expected in the future. Last week the London branch held their first meeting and it was a success under the chairmanship of Mr. H. Goldstraw, of the firm of John Dickinson & Co., Croxley Paper Mill. One of the members, Mr. F. Heckford, dealt with several subjects on the chemical side of papermaking in a general way and in the discussion that followed. Mr. R. W. Sindall took part. One of the Scottish branches has become so interested in the technical work that a local University has been approached with a view to providing classes for students in papermaking and if Manchester can do it there is no reason why Scotland should be in the backward area.

Pulp Prices Easier.

Sellers of pulps are trying to encourage buyers with easier prices. In other words they want to liven up a dead market. Beyond small dealings, very little business is being transacted in other sulphite, sulphate, or groundwood, and, consequently, pulp men are anxious to meet the paper makers as best they can in quotations and revising standing contracts. Quotations are now about as follows c. i. f. to United Kingdom ports:

Bleached sulphite, £50 — £52; Easy Bleaching, 37.5 —38; Sulphite news, 32.5 — 34; Unbleached soda, 32.5 —34; Soda kraft, 29.15 — 30; Groundwood 50 per cent wet., 10; Groundwood dry, 20.

News has reached London that the workers in some of the Swedish pulp mills are on strike over the question of wages and output is being hampered. In Norway there is also considerable unrest, but the mill workers are looking on the depression existing from a sensible point of view. Taken all round the Scandinavian pulp market is very quiet and enquiries on a small scale.

Recently small shipments of unbleached sulphite have reached England from Canada. Germany is now sending dry groundwood into the British market at a little over £20 a ton.

The Paper Situation.

There is no improvement to report in the market. Depression still rules, printers are "slack", and paper sellers are down now on rock-bottom prices. Many mills still remain closed, unemployment is still great, and looking round at things generally. I am afraid the British mill man is as far off a revival today, as he was in October last, when the depression set in upon him with a vengeance. With this gloominess overhanging a great industry one cannot expect pulp sellers to look cheerful, no matter what inducements they may hold out to buyers. But still the fact remains that the paper mills of the United Kingdom are undergoing a severe strain and all sorts of devices are being used to compel them to sell under the cost of production. Some of the big newspapers, not pleased with the cost of newsprint, act like fools in their paradise. They keep shouting into the ears of the paper mill man that Germany and Scandinavia are dumping cheap shipments into market and that prices of British paper must come down to the same level. It is true some cheap lots did find their way into London and capital was made out of them; but all the agitation conjured up by the big buyers did not force down prices to the level they expected and now they are resorting to the same methods again during the period of depression. British papermakers, however, are firm and, perhaps, know more about what is coming into the market than buyers do.

The Spirit of Co-operation.

Naturally in these days of dire distress, depression, and uneasiness, one may ask what is being done to bring things to a normal state. Well, there is a spirit of co-operation prevailing. Pulp men are trying to meet the paper mill men in every way possible and the paper mill men are trying to meet the wishes of their customers. There is a give and take policy prevailing, otherwise there would be serious financial losses in many quarters. For instance, some big buyers of paper have been so hard pressed that they have actually asked the mill to cancel their contracts. Recognising the serious state of affairs the mills have acquiesced and a good customer helped out of a dilemma. Pulp men do their share also, and so does the worker. And the relationship between worker and employer today is quite in keeping with the prestige of the British mills, notwithstanding the serious unemployment problem, because, the employee realises that in a period of depression, or slump, it is useless to try and draw blood out of stone through the channels of trade unionism, which is undergoing a severe financial strain as well as the pulp and paper industry. Consequently, in this period of uncertainty there is a spirit of friendship and sympathy, one with another,—a spirit of cooperation in order to stabilise the industry and bring about a revival of trade.

Irish Paper Mills Co. Ltd.

The Irish Paper Mills Co., Ltd., of Clondalkin, Co. Dublin, in which Mr. F. E. R. Becker takes an interest, appealed a few days ago for support in offering £150,000 8 p.c. 1st mortgage debentures at 98, redeemable at 105 p.c. over 15 years. For over 100 years this mill has entered for the Irish and English trade and since it passed int othe hands of the present owners £180,000 has been spent from 1914 up to the present, in bring ing it up-to-date.

Notelets.

Kraft paper is selling at £43 a ton—when an order is obtained.

Scotish mills have big stocks of exparts. Nearly all the exports in Algeria has been purchased for the United Kingdom.

While working on a chimney stack at the Godalming Paper mill, a steeple jack was gassed. His mate lashed a rope round him and lowered him to the ground, by means of a pulley, for medical treatment—an act which made those who saw it feel dizzy.

The Manchester School of Technology has demonstrated a process, known as the Robey-Taylor system, for treating papermaking fibres. It is claimed to give an improved yield and a greater product. Geo. Taylor, of Dallas, Texas, U.S.A. carried out trials with cotton linter, hemp, jute, and the paper samples were looked upon as creditable.

A catalogue of the catalogues published in Canada is now open for inspection at the British Overseas Trade Department. Canadians need not worry about it.

Shipments of pulp to the United Knigdom during February are on a small scale.

It is satisfactory to note the name of long established pulp agents appearing in the official register of imports from Canada — thus bearing out the old war saying "Trade Within The Empire."

Electrolytic Bleach in India

Mr. R. Sitarama Rao, of Bangalore, India, came to the University of Maine for special courses in Pulp and Paper Technology. He was asked for an opinion on the possibilities in India for making electrolytic bleach in connection with the manufacture of paper, textiles, etc. His interesting reply is as follows:

To answer definitely your question whether India can make her own electrolytic bleach is not quite possible. I did not make a critical study of Indian Geology from an economical and industrial standpoint, since it formed a part of the course in general geology. The vast size of the country — a country as large as the continent of Europe excluding Russia — makes it difficult for one who has not made a special study of the subject in question to speak or write authoritatively on it for the whole of India. However, I will give a more general information about those parts of India with which I am least familiar and a more definite information about those with which I am most familiar.

Many of the present industrial plants are more or less situated near or in large cities. In many of these places electricity is generated either by water power or by steam for mills and for running street cars. I know that electricity is generated by means of water power in Kashmir, a Native State, close to the Himalayas in the North-West, and famous for some very fine fancy goods in papier-mache. I do not definitely know whether lime could be had in large quantities there. In and round about Calcutta there are large factories. I do not know how they get their electricity. In the State of Mysore, the river Cauvery has been harnessed at Sivanasamudram and the electricity generated is used for street and home lighting, for mining, and for running some spinning and weaving mills. A couple of artificial lakes have been constructed by putting dams right across the rivers Vedavati and Cauvery, and the water from them can be used for generating electricity. The Government is thinking of making good use of the water-fall at Gerusoppa, a fall of about 990 feet. In the same State of Mysore, which is about 700 miles to the south of Bombay, there are a few other places where electric power could be generated. In Travencore, another Native State, forming the southernmost eastern corner of India, there was some years ago a paper mill. A conversation with one of the paper mill proprietors in Bombay made me believe that there were some facilities for water power in that State.

In Bombay generators are driven by steam turbines and the power is used for running street cars. Each mill generates its own electricity by steam or oil engines. Lately a gigantic scheme known as Tata's Hydro-electric scheme was started to supply electricity to Bombay and its suburbs. The scheme briefly stated is as follows:

Three artificial reservoirs or lakes, one below the other and each connected with the succeeding one by means of a channel, were to be constructed. The last artificial lake was to be connected to a small reservoir by an aqueduct running through a number of short tunnels. From the small reservoir which could be drained dry at pleasure should be run three penstocks about 6 ft. 6 inches in diameter almost to the foot of the hill and each of them were then to be divided into five or six branches. Each branch was to drive an undershot Pelton wheel directly coupled to a generator. The head water is more than 1,650 feet high from the wheels. More than half of the work had been finished when I left India. When that is completed, there would be a very large amount of electricity available for many industrial enterprises in and round about Bombay. The Power House is near Karjat, about 50 miles from Bombay. It may not be out of place here to mention that the reservoirs have not any perennial rivers as feeders and for the supply of water they depend upon rainfall. The rainy season lasts for about three months in the year.

With regard to the supply of lime, I think, there will not be much difficulty in many parts of India. That part of the Western Ghats, where the Hydro-electric Scheme is situated, are of basaltic formation with plenty of fine calcite crystals and any amount of limestone can be had there and near Bombay.

There are extensive beds of rock-salt in the N. W. parts of India and salts are manufactured to a small extent in the interior from certain kinds of earth. By far the largest supply comes from sea-water. The manufacture of salt is a Government of India monopoly, and if the Government means to help the industry large quantities of it can be had.

In conclusion I might say that there might be many places such as Kashmir, Calcutta, Travencore, etc., suitable for making electrolytic bleach; the State of Mysore has every possibility for making electrolytic bleach if industries are started; and Bombay has every facility for making the same already or in the near future.

The above is only general information. Since we are interested in paper industry in particular some attention to it is not out of place. There are about seven or eight paper and pulp mills in India, scattered about in the country. The larger mills are in the north. Two mills are near Calcutta, and a third about 120 miles from Calcutta. One paper mill is in Lucknow. All the above mills use mostly Sabai grass, rags, jute, etc. The rest of them are small ones. They are at Baroda, Bombay, Poona, etc.

The paper mills near Calcutta are under foreign management and are probably well situated for making their own electrolytic bleach. The mills in Bombay can make their own bleach as the can receive their supply of electricity from Tata's Hydro-electric Scheme. The paper mill at Poona has every chance for making it in the near future. If a pulp and paper mill is started in the State of Mysore, they will try to make their own bleach.

CHEMISTRY OF PULP AND PAPER MAKING. By Edwin Sutermeister, 479 pages, 55 figures and 31 full page photomicrographs. John Wiley & Sons, Inc., New York, 1920. Price, Cloth $6.00 (U. S. funds). Obtainable in Canada from Renouf Publishing Co., Montreal.

The increasing importance of technical control in the pulp and paper making industry has created a demand for more extensive literature dealing with the subject. Indeed, the existence of a comprehensive and constantly increasing literature is the mark by which an industry may be known to have passed the stage of trade-secret, rule-of-thumb methods and to have reached the point where science has taken hold and the knowledge of all is at the service of any. Judging by this alone, it is evident that the past ten years have witnessed the transition in the paper industry in America.

But although the technical literature appearing in this last decade has reached satisfactory proportions it has almost without exception, taken the form of short articles or booklets dealing with particular phases of the industry. For a connected treatise we had still to look to European writers who, of course, dealt with the industry as carried on in Europe. The one textbook of purely American origin really appeared before its time and was out of print when the increasing demand began to make itself felt.

But the last few months have altered this condition of affairs. First, we have Witham's book with its excellent data on the mechanical side of pulp and paper making and now appears the ideal complement to it, Sutermeister's "CHEMISTRY of PULP and PAPER MAKING", published by Wiley, and it covers about as well as could be expected of a single book all that its title indicates.

It is not to be expected that such a work should be up to the minute and furnish the late news in the technical world as is done by the journals but this one comes very close to it. The chapter on "Cellulose", for instance, embodies all the late work of importance on cellulose determination except that of Dore whose publications appeared about the time this book must have been in process of typesetting. As a second edition will doubtless be a necessity very shortly, it is possible that the author may even include this in it. Whether he does or not, he has provided in this chapter a very clear and concise account of the main reactions of cellulose and for those who would go into greater details he has furnished a copious but well selected list of references. The many reference notes throughout the book are, indeed, not its least valuable feature

The chapter on fibrous raw materials is extensive and excellently illustrated by photomicrographs prepared by the Bureau of Standards. This chapter, in addition to giving chemical data on the different materials, also contains a number of tables of other data, valuable for chemical engineering work, such as the weight per cubic foot of the materials, the bulk under different conditions, the solid wood per cord, etc.

The processes of pulp and paper production are well treated from the chemical point of view and methods of control and test are given fully. The author has evidently been at pains to prevent his personal opinions having any undue influence. Where dealing with debatable points, he presents the argument on both sides with great fairness.

Mr. Sutermeister's long experience gives practically all of this work the authoritative force of intimate knowledge. His manner of expression makes the book easy reading for anyone interested in the chemistry of this industry. Extraneous matter has been skillfully omitted. The quality of paper and the workmanship of the book could hardly be better.

The chapter headings are:—Cellulose; Fibrous Raw Materials; Rags, Esparto, Straw, Bamboo; The Soda Process; The Sulphate Process; The Sulphite Process; Ground Wood or Mechanical Pulp; Bleaching; Sizing; Loading and Filling Materials; Coloring; Coated Papers; Water; Testing Wood Pulps; Paper Testing; Printing; Appendix.

Any book is open to some criticism; the most serious in this case is the entire omission of any reference to the chemical reactions of cellulose in the beater. Some minor points such as assuming a knowledge by the reader of Millon's reagent might be found by a careful examination but on the whole the book is exceedingly well prepared by both author and publisher. It is well worth an important place on the "handy shelf" of every pulp and paper mill laboratory.—W. B. Campbell.

DON'T OIL HANGER BEARINGS LIKE MACHINE

Lubrication like belting is a subject that is very much misunderstood. Just as mechanical men in mills and factories have looked upon belting in the past as just belting, they have looked upon lubricant as just lubricant, failing to recognize that there is a science in the application thereof.

Of course, there have been exceptions to the above, but generally speaking, neither belting nor lubricant has received proper consideration. Nor can it be said that there is a universal awakening to the importance of these things now. Belting and lubricant are receiving more attention than they formerly received, but the field for missionary work is broad, and as in religion, it will always need to be carried on to win new converts and prevent backsliding.

One step toward better lubrication is the classification of the bearings on all machinery in the plant, thus: (1) High-speed high pressure bearings, (2) medium-speed medium pressure bearings, (3) high speed low pressure bearings. (4) special bearings. A special lubricating oil will be needed for each one of these classes. In the average shop the same oil that is employed to lubricate a large boring mill is also used to lubricate a sensitive bench drill. In other words, there is a universal application of one single grade of oil throughout the shop. Nothing could be more impractical or unscientific than this. A lubricating oil with sufficient viscosity for use on a huge boring mill could by no means be successfully employed on a piece of small machinery, with its moving parts revolving at high speed.

The same oil that is used on the bearing of a 9-in. lathe should not be used to lubricate the bearings in the shaft hangers. When a lubricating oil is too viscid it actually retards (because of its high internal friction) the motion although it lubricates the moving parts. On the other hand, an oil that does not possess sufficient viscosity (usually termed a "thin" oil) is unable to withstand high pressure, and poor lubrication will result owing to the fact that the oil will be squeezed out of the bearings. These few facts will illustrate the impossibility of using one oil throughout the entire shop without a serious loss of power and general efficiency of the machine.—The Amphibian.

PULP AND PAPER NEWS

Public School Inspector Wilson at Haileybury, told a gathering of high school pupils that the pulpwood cut of Northern Ontario last year would, if gathered together, stretch out in a line four feet high from Iroquois Falls to Toronto. The distance between the points mentioned is approximately 460 miles.

Amalgamation of the Canadian interests of Sinclair & Allen, publishers of Toronto, and Eaton, Crane & Pike Co. of Pittsfield, Mass., is announced by officials of the two concerns. A. Sinclair will be the president of the new company, which will enter into the manufacture of the Eaton, Crane & Pike Co. line of fine stationery. Col. W. H. Eaton, treasurer of the Eaton, Crane & Pike Co., will be vice-president.

Mr. Justice Middleton, at Osgoode Hall, Toronto, refused to dismiss the action taken by the Spanish River Pulp Mills Limited, for an injunction restraining the Riddell-Latchford Timber Commission from enquiring into matters which the company claims to be beyond the scope of the enquiry. Chief Justice Sir William Mulock recently refused to grant an interim injunction upon the application of the company because the Timber Commissioners had not had notice of the application. However the commissioners refused to proceed farther with the probe until their status was established.

Mr. Harry L. Muir, the hustling sales representative of the Don Valley Paper Mills, Limited, Toronto, has returned from a business trip through the Maritime Provinces to Halifax. Although the same business conditions exist throughout the east, as in Ontario, Mr. Muir says a spirit of optimism is quite apparent in the paper trade and eastern dealers and manufacturers are confident of a return to normal conditions during the summer months.

At the annual meeting of the Lincoln Paper Mills Company, Limited, St. Catharines, held last week the following officers were elected: president, Mr. A. S. directors, Mr. H. K. Woodruff, Mrs. W. D. Woodruff Woodruff: vice-president, Mr. T. A. Woodruff and Mr. H. H. Collier.

Dwight P. Robinson & Company, Incorporated, a large firm of engineers and constructors of New York, has recently opened branch offices in Montreal in the Dominion Express Building. Alexander C. Barker, Vice-President, is in charge of the office. The company is a consolidation of Westinghouse, Church, Kerr & Co., Inc., and Dwight P. Robinson & Co., Inc., and has done extensive construction and engineering work in Canada for the Canadian Pacific Railway, Canadian Salt Company, Canadian Crocker-Wheeler Co., Dominion Government, Aetna Explosives Company, Grand Trunk Railway and others.

Although at the present time the output of blotting paper at the Howard Smith Paper Mill at Cornwall is not large, the company expects that before the end of the present year it will be possible to devote one machine entirely to the manufacture of blotting. This branch of paper making marks an innovation in the paper manufacturing industry of Canada, the Howard Smith Company being the first concern in the Dominion to undertake the manufacture of blotting paper. Prospects are favorable for the new Canadian undertaking inasmuch as the raw material largely originates in Canada and the product being turned out at the Cornwall mill is of highly satisfactory quality.

The profits of the American Sales Book Company for the past year show an increase of $175,000 compared with the preceding year and an increase of $285,000 against the figures of 1918, according to reports submitted at the annual meeting in Toronto In addressing the shareholders, President S. J. Moore, pointed out that the company's business has never shrunk more than twenty per cent, under the most unfavorable circumstances. He stated that shipments during January and February exceeded all previous records. The former board of directors were re-elected.

The action by the Attorney-General of Ontario against J. R. Booth, of Ottawa, will be tried at Ottawa, according to an order made by J. A. C. Cameon, Master in Chambers at Osgoode Hall Toronto. H. S. White appeared for the Attorney-General on the motion to change the venue from Pembroke. F. S. Mearns appeared for the defendant. The Attorney-General alleges that the Booth employes cut timber estimated at two million feet, board measure, on the Bonchere river limits of the Golden Lake Lumber Co. Damages to the extent of $40,000 are sought. The defence is that the rights to cut timber were regularly acquired, and that in any event the action is barred by the statute of limitations. The cutting is alleged to have taken place in the years between 1911 and 1915.

Death removed an old and esteemed resident of Toronto last week in the person of Mr. William Clarke, who died at the residence of his brother in New York. In the early days he was a builder and contractor in Toronto and later he was partner, with three of his brothers, in the Gulf Pulp & Paper Company, which some time ago was disposed of to the Northcliffe interests. The Clarke Brothers were the founders of the business, which is situated in Quebec Province, and they established what is now Clarke City, in the Gulf of St. Lawrence, near Seven Islands, where a large pulp mill was erected and operated. The brothers also acquired extensive limits in the province and built up a large business, until now Clark City has a population of about ten thousand The late Mr. Clarke had reached the advanced age of 71 years and is survived by his wife, four sons and one daughter.

Belgo Canadian Company anticipates a slight slackening of demand for newsprint and a consequent curtailment of operations to some extent.

The Royal Securities Corp. are placing on the market $2,000,000 of 8 per cent bonds for Fraser Companies, Ltd. The price is 99 and accrued interest, to yield 8.10 per cent.

Mr. John Hewitt, of the Paper Sales Company, Yonge Street, Toronto, who has been in poor health for some time left this week for Virginia where he will spend some time in a much needed rest.

The Soo Mill of the Spanish River Company boasts a team of girl hockey players. From the scores reported in the Spanish River News they have something to boast of.

MAKE THEIR OWN LIME.

The Pacific Mills Company at Ocean Falls, B. C., now have their own lime kilns. They have a capacity of twenty-five tons daily. The limestone is quarried at a point one hundred miles distant, and transported to the kilns by scows. The mill makes both sulphite and sulphate pulp.

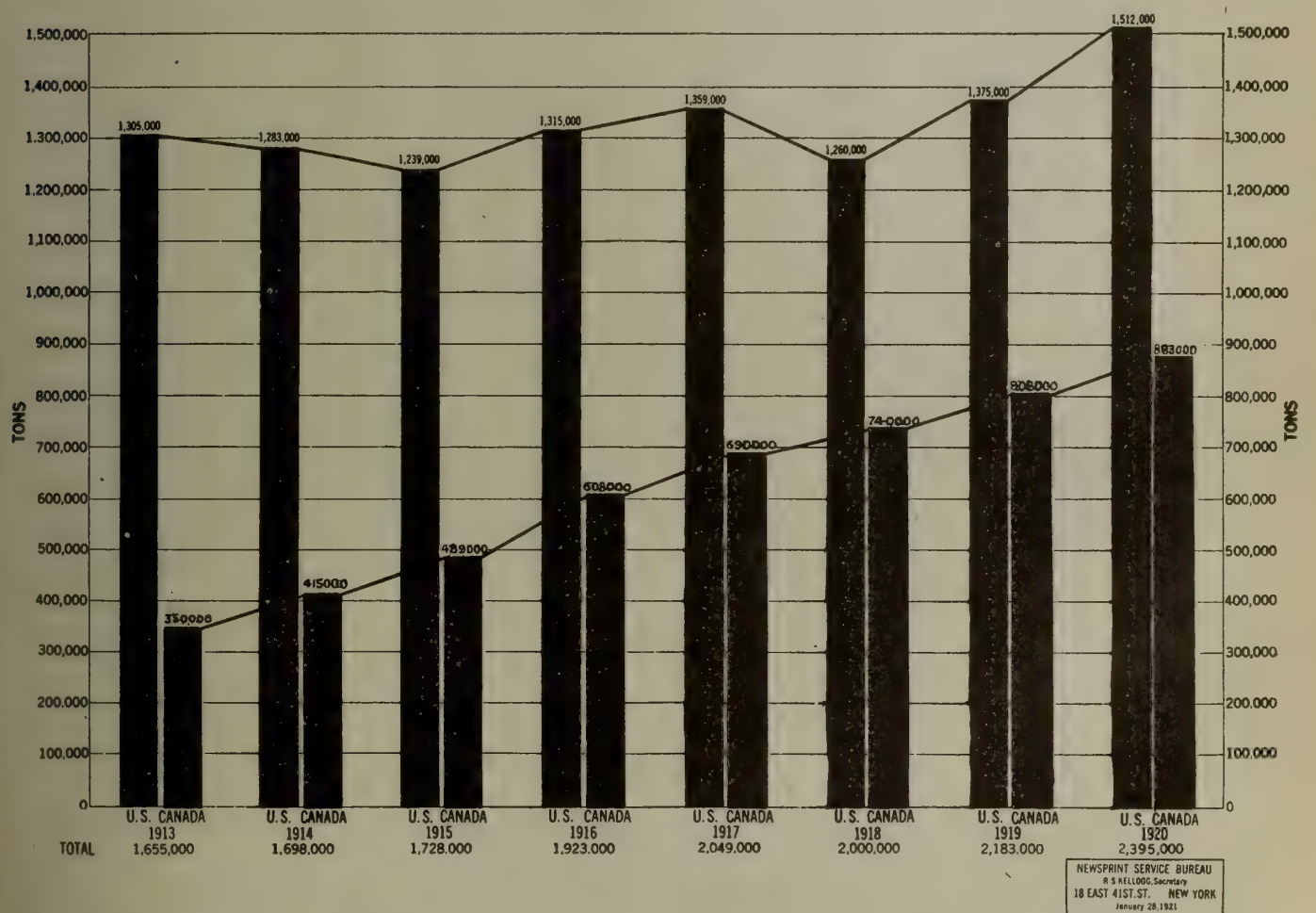
FIRE IN WASTE PAPER.

Several hundred tons of waste paper were destroyed by a fire which partially destroyed a warehouse at 342 Des Carrieres street, Montreal, last Saturday afternoon. The building, which is owned by A. Wiker, paper dealer, is a large wooden construction, and soon after the discovery of the fire was a mass of flames. Control of the fire was obtained in less than 25 minutes, but men had to be left working until yesterday morning to prevent any outbreak in the tightly pressed bales.

"In old Babylonia," we are told, "they didn't print their literature, they baked it." Over here and nowadays, as a rule, we roast it.—"Nashville Banner."

The general situation seems to be pretty well summed up in the confession of an Atchison negro: I sleeps well, and I eats well, but somehow I has no desiah to work."—"Kansas City Star."

NEWS PRINT PRODUCTION, 1913-1920 UNITED STATES AND CANADA



Production.		Average Yearly Increase.				
Year.	Tons.	Tons.	Percent.			
1904	913,000			1916	1,923,000	
		80,260	8			125,000 7
1909	1,326,000			1917	2,049,000	
		82,250	6			*49,000 *2
1913	1,655,000			1918	2,000,000	
		43,000	3			183,000 9
1914	1,698,000			1919	2,183,000	
		30,000	2			212,000 10
1915	1,728,000			1920	2,395,000	
		195,000	11	16 Year Average		92,600 6

(*) Decrease.

Technical Section

CANADIAN PATENTS FOR PULP AND PAPER MAKING.

C-6. Saw filing device. Can patent No. 204,306, WM. H. KRAMER, Newcastle, Indiana, U.S.A., Sept. 28, 1920. Claims allowed 5. —A.P.-C.

C-6. Saw filing clamp. Can. patent No. 204,340, JOHN SZAKO, Kenosha, Wis., U.S.A., Sept. 28, 1920. Claims allowed 2.—A.P.-C.

C-6. Wood sawing machine. Can patent No. 204,698, ARCHIE MACLEAN, Campbell's Bay, Que., Oct. 12, 1920. Claims allowed 2.—A.P.-C.

C-7. Pulpwood washing machine. Can. patent No. 196,373, JAS. L. PHILLIPS, Great Bend, N.Y., U.S.A., Jan. 20, 1920. Claims allowed 1. Same as U.S. patent No. 1,309,543. See Pulp & Paper, **18,** 81, C-7, Jan. 22, 1920.—A.P.-C.

E-2. Utilization of "sulfite turpentine". Can. patents Nos. 204,768 to 204,779, inc., The Selden Company, Pittsburg, Pa., Oct. 12, 1920. 204,768.—A process of nitrating cymene which comprises dissolving a mixture containing cymene and terpenes in strong H_2SO_4, adding to the soln. a mixt. of strong HNO_3 and H_2SO_4 while stirring and while maintaining the reaction mass at not materially above O°C, until an amt. of HNO_3 corresponding to an excess of about 10% over the amt. theoretically necessary to form mono-nitro-cymene has been added, whereby the cymene is nitrated and the other ingredients are substantially unaffected. Claims allowed 9.

204,769—A dyestuff comprising a salt of the compd. diazo-cymene coupled with a hydroxy derivative of an aromatic hydrocarbon. A metal salt of cymene-azo-betanaphthol, being insoluble in water and of a brilliant reddish orange color, and capable of dyeing fabrics a brilliant reddish orange color. Claims allowed 4.

204,770. The herein described new class of dyestuffs comprising diazo-cymene coupled with an amino derivative of an aromatic body containing the naphthalene nucleus, at least one of the H atoms of said nucleus being replaced by the HSO_3 group. Claims allowed 5.

204,771—A process of making dimethyl-diisopropyl-benzidine which comprises reducing crude mono-nitro-cymene as produced by nitrating spruce turpentine, such reduction being performed in an alkaline solution to produce hydrazo cymene, and subjecting the hydrazo cymene to the "benzidine transformation", whereby dime thyl-diisopropyl benzidine is produced, and precipitating a compound of dimethyl-diisopropyl-benzidine while leaving a large part of the other constituents of the spruce turpentine in solution. Claims allowed 3.

204,772—A process of making the sulfonic acid derivative of amino-cymene, which comprises heating amino-cymene with H_2SO_4 of not less than about 98% strength until the reaction mass no longer contains uncombined amino-cymene, dissolving and neutralizing with an alkali, boiling with charcoal and thereafter again acidifying to precipitate the sulfonic acid. Claims allowed 2.

204,773—A process of making thymol which comprises rendering inactive the amino group of amino-cymene, nitrating the product, to produce a nitrated amino cymene compound, and thereafter removing the amino group and substituting OH in the place of NO_2. Claims allowed 3.

204,774.—A process of making dyestuff which comprises reacting with the tetrazo compound of dimenhyl-diisopropyl-benzidine upon a hydroxy aromatic compound in an alkaline solution at a temperature not materially above 10°C. Claims allowed 6.

204,775—A process which comprises rendering inactive the amino group of amino-cymene, nitrating the product, and thereafter reducing the nitrogroup so introduced. Claims allowed 5.

204,776—A process of making dyestuff which comprises reacting with the tetrazo compound of dimethyl-diisopropyl-benzidine with an amino aromatic compound in an acid solution at a temperature not materially above 10°C. Claims allowed 5.

204,777—A class of S dyes derived from a N containing cymene compound, said dyes being capable of dyeing unmordanted cotton, and being of somewhat more brilliant colors, respectively, than the corresponding S dyes derived from the corresponding benzene compounds. Claims allowed 6.

204,778—The herein described new S dyes, derived from a para-amino-hydroxy-aromatic compound and amino-cymene or nitro-cymene by sulfurization, said dyes being soluble in alkaline solution, soluble in a solution of alkali metal sulfide and being capable of dyeing unmordanted cotton in an alkaline bath. Claims allowed 5.

204,779—The process which comprises vulcanizing rubber in the presence of amino-cymene, Vulcanizing rubber containing amino-cymene or its derivatives. Claims allowed 5.—A.P.-C.

E-2; F-2. Recovery of by-products from waste liquors. Can. patent No. 196,329, INGVAR SORAAS, Norway, Jan. 20, 1920. A process for the recovery of valuable substances from the waste liquors from pulp manuf. The liquor is protected against all oxidizing agents, by means of waste gases from autoclaves in which the oxidation has already taken place, and it is heated until it has reached such a temp. that the heat of reaction developed during oxidation raises the temp. of the liquor up to or above the temp. of pptn. of the substances which require the highest temp. to ppt. so that no supply of heat is required after the oxidizing agents have been introduced. Claims allowed 3.—A. P.-C.

E-2. Method of precipitating lignin in waste sulfite liquor. Can. patent No. 196,328, INGVAR SORAAS, Norway, Jan. 20, 1920. Claims allowed 6. Same as Fr. patent No. 487,953, May 17, 1918. See Pulp & Paper, **17,** 514, E-2, May 29, 1919.—A.P.-C.

E-5. Acid charging system for digesters. Can. patent No. 204,671, F. J. DOOLEY, Boston, Mass., U.S.A., Oct. 12, 1920. In an acid charging and steaming system for digesters, a steam conductor adapted for connection with a source of steam supply having a proportion thereof elevated above the acid level of the digester and extended downward and in communication with the interior of the digester below the acid level thereof, an acid conductor adapted for connection with a source

of acid supply having a portion thereof elevated above the acid level of the digester and in communication with the similarly elevated portion of the downwardly extended steam conductor, and an acid control valve included in the elevated portion of the acid conductor. Claims allowed 3.—A.P.-C.

E-5; F-5. Automatic steam control for pulp digester. Can. patent No. 204,953 CARLETON H. ALLEN and The Great Northern Paper Co., assignee of a half interest, Millinocket, Me., U.S.A., Oct. 19, 1920. A pulp treating apparatus of the character described comprising in combination, a digester, means for supplying steam to said digester, and means for automatically controlling the rate at which said steam is so supplied to maintain substantially predetermined but variable temperature conditions in said digester during a predetermined interval of time. Claims allowed 14. (See also Pulp & Paper, **18**, 1041-2, Oct. 7, 1920.)—A.P.-C.

F-5. Process of treating resinous woods. Can. patent No. 204,982, JOHN T. COLLINS and ALFRED S. WILLIAMS, assignee of a half interest, Boston, Mass., U.S.A., Oct. 19, 1920. The process of treating resinous woods so as to produce a separation of the various products contained by means of the application of the chemicals NaOH and HNO_3 in combination to a mass of softened wood, and in the subjection of the whole compound to pressure and agitation by any convenient means so as to produce a separation of the products contained in the wood to best adapt them to commercial use. Claims allowed 6.—A.P.-C.

G-5. Method and apparatus for washing pulp. Can. patent No. 204,755, The Brown Co., assignee of O. B. BROWN, H. K. MOORE, and H. PARKER, Berlin, N.H., U.S.A., Oct. 12, 1920. A continuous process of washing fibrous material, which consists in continuously feeding said material to and washing it in successive baths of wash liquor, and causing the liquor to flow in the opposite direction to form such successive baths for the oncoming fibrous material. An app. for washing pulp, comprising a series of agitator tanks with agitators therein, and cylinder tanks with screen cylinders therein, all arranged in alternation, with means for permitting the flow of washed material from each agitator tank to the next cylinder tank, means for transferring the washed pulp from each cylinder to the next succeeding agitator tank, a plurality of communicating tanks having pools of wash liquor therein, means for circulating the wash liquor from each pool through an agitator tank and a cylinder tank, means for supplying to the pool, at the end of the app. at which the washed pulp is delivered, a stream of relatively pure wash liquor, and means for conducting from the pool at the other end of the app. the liquor containing the impurities washed from the fibrous material. Claims allowed 43.—A.P.-C.

K-5. Grinding apparatus for the manufacture of owod pulp. Can. patent No. 203,945, PETER CHRISTIAN SCHAANNING, Vestre Holman, Near Kristiania, Norway, Sept. 14, 1920. Claims allowed 19. A.P.-C.

K-6. Method for removing printer's ink from paper. Can. patent 203,587, The Jespersen Paper Co., New York City, Assignee of THOS. JESPERSEN, Neenah, Wis., Aug. 31, 1920. Claims allowed 5. (See Fr. patent No. 492,195, Pulp & Paper, **17**, 1026, Nov. 27, 1919; U.S. patent No. 1,311,564, Pulp & Paper, **18**, 301, K-6, March 18, 1920.)—A.P.-C.

K-6. A process for removing ink and coloring matter from printed paper. Can. patent No. 204,398, WESLEY M. OSBORNE, Carthage, N.Y., U.S.A., Sept. 28, 1920. A process of removing ink and coloring matter from printed papers, consisting of treating the papers in a digester to the action of sulphurous acid and sodium carbonate, applying heated steam to the solution, causing the papers to circulate slowly at first, gradually raising the temperature and pressure and cooking the contents of the digester rapidly, the pulp being bleached by the sodium sulphite produced by the reaction of the sulphurous acid and sodium carbonate. Claims allowed 3.—A.P.-C.

K-10; 18. Wall board size. Can. patent No. 196,913, The Beaver Co., Assignee of B. W. SIDWELL, Buffalo, N.Y., U.S.A., Feb. 3, 1920. Claims allowed 14. Same as U.S. patent No. 1,313,343. See Pulp & Paper, **18**, 301, K-18, March 18, 1920.—A.P.-C.

K-11. Paper machine. Can. patent No. 196,154, The Great Northern Paper Co., Millinocket, Me., Assignee of CHAS. E. POPE, Springfield, Mass., Jan. 13, 1920. In a paper making machine, upper and lower dryers, aprons therefor, and means adjacent one dryer to direct blasts of air in opposition on the web during its transition to the other dryer, said oppositely directed means arranged to act in substantially an axial direction on one dryer to strip the web therefrom and carry it towards the other dryer. Claim allowed 5.—A.P.-C.

K-11. Apparatus and process for making lines and watermarks on paper. Can. patent No. 196,157, Kansas Pappersbruks Aktiebolag, Assignee of ONNI SUURSALMI, Jyvaskyla, Finland, Jan. 13, 1920. The process consists in providing a series of apertures arranged in a manner corresponding to the desired lines or marks at predetermined points in the path to be traversed by the pulp during manuf., and supplying a regulated flow of water to some and a regulated suction to others of the apertures as the pulp passes over them. Claims allowed 3. Same as Fr. patent 496,612. See Pulp & Paper, **18**, 439, K-12, Apr. 22, 1920.—A.P.-C.

K-11. Felt cleaner for paper machines. Can. patent No. 196,497, E. D. BENNETT, Pulaski, N.Y., U.S.A., Jan. 27, 1920. A felt cleaning device for paper machines comprising a pipe having an open side adjacent the felt, and means for creating a fluid current in the pipe and through the open side thereof and adjacent portion of the fabric for removing any substance which may have become lodged in the felt, a pair of rollers for engaging the felt on opposite sides of the pipe, and means for adjusting the rollers to force the felt against the open side of the pipe. Claims allowed 1.—A.P.C.

K-11. Cloth for paper machines. Can. patent No. 196,909, R. SPENCER, Mosgrove, Lancaster, England, Feb. 3, 1920. A cloth applicable for jackets or couch roll covers, dry felts, etc., which consists in warp threads usually considerably larger in diam. than the weft threads, and the weft threads floated over a larger number of warp threads than they go under, the side which is mainly weft being the wearing side. Claims allowed 3.—A.P.-C.

K-11. Black Pulp screening device. Can patent No. 204,753, The Bird Machine Co., assignee of RALPH S. CLARKE, Walpole, Mass., U.S.A., Oct. 12, 1920. In a machine of the class described, the combination of a tank, a screen mounted for rotation therein, a spray pipe adapted to project a shower against the screen surface, a valve controlling the supply of water to said pipe, a constantly driven power element, a belt wheel in driving connection with the screen, a loose belt extending therefrom to the driven element aforesaid, a

(Continued on page 283)

UNITED STATES NOTES

Wage re-adjustments amounting practically to a return to the scale that was in effect prior to February 1, 1920, will be put in force in the plants of the American Writing Paper Company in the near future if the firm's officials can make the employee's representatives see their point of view. A 20 per cent. increase was granted February 1, 1920. The company management holds that with the 1919 wage schedule in force the workers' pay will be 125 per cent greater than it was before the war. Conferences on the proposed reduction are at present going on.

The Eaton, Crane and Pike Company of Pittsfield, Mass., manufacturers of fine stationery and distributors of the Crane papers of Dalton, have combined with Sinclair Allen & Co. of Toronto to form a Canadian branch under the firm name of the Eaton, Crane and Pike Company of Canada, Ltd. Its officers are president, Norman A. Sinclair of Toronto; vice-president, William H. Eaton of Pittsfield and secretary and treasurer, Thomas Allen of Toronto. The Pittsfield Company has been handicapped in establishing a Canadian branch by the import duty of 35 per cent.

The Pennsylvania Department of Forestry received word last week that 1,000,000 white pine trees shipped from Mont Alto and Caledonia State forests as a gift to the French Government for reforestation died because they could not be unloaded at a port. Shipping congestion prevented unloading before the trees dried up.

Philip Hano and Company, manufacturers of blank books and loose leaf systems are removing their plant from New York to Holyoke, Mass. They have secured a lease for two floors in the American Braiding Company Building, Holyoke, and they expect to have the new factory there in operation about the first of next month. The transfer of machinery is already under way. The Hano Company employs about 500 persons, many of whom are going to Holyoke from New York. The officials of the company are interested in a housing plan to furnish quarters for the newcomers and their families. The office of the company will be maintained in New York City. The manufacturing activities are being transferred to Holyoke because it is desired to be nearer the paper supply.

A bill to abolish division of waters in the Conservation Commission of the State of New York and to transfer engineering work relating to the flow of water and streams from the conservation commission to the State engineer and surveyor was introduced in the Legislature at Albany last Friday by Senator Ferris. Water power plans and specifications would have to be approved by a commission comprising the conservation commissioner, attorney-general and State engineer. Gov. Miller of New York, it is said, may soon send a message on the subject of water power in which he will recommend that the State take up development of the 1.200.000 horse power in the State and lease it for operation to private companies. Another matter the Governor has on his mind is doing away with the fire rangers in forest preserves, turning their duties over to the State Police, which shall establish a fire patrol by means of aeroplanes. It is understood that George D. Pratt, the Conservation Commissioner, is opposed to the latter scheme.

The Federal Power Commission last week granted to the Niagara Falls Power Compony a fifty year license to use 19,500 cubic feet a second of 20,000 cubic feet of water diverted from the Niagara River. This diversion is permitted by the terms of a treaty with Canada. The company is using practically the entire diversion under a consolidation of power companies effected as a war measure. Under the permit the company must hasten extensive improvements, extend a new transmission line across Grand Island to Buffalo and another to supply power to the Niagara, Lockport and Ontario Company. The additions required will increase the plant's output from 300,000 to 400,000 horse-power.

The American Pulp and Paper Mill Superintendents Association has made plans to hold its annual spring convention at the Waldorf-Astoria, New York City, June 3, 4, and 5.

Pulpwood consumption by mills in New York, New England and the lake States was 17.4 per cent greater in 1920 than in 1918, and production during the same period increased 17.5 per cent, according to estimates made public by the Forest Service, based on figures from 118 mills, representing 41 per cent of the total consumption of these States. The estimates were contained in the first preliminary statement by the Forest Service in connection with the study of pulpwood consumption being conducted in co-operation with the American Pulp and Paper Association and the Census Bureau. Should the percentage hold true for the remaining mills the 1920 consumption would equal 6,180,000 cords, or nearly 13 per cent more than the record made in 1917, and the production would be approximately 3,894,000 tons, or 10.9 per cent more than in 1917.

Leading paper and pulp mills in the United States and Canada will be visited in the near future by Hjalmar Wessel, a prominent Norwegian paper and pulp maker, who arrived last week in New York City on the steamship "Stavangerfiord", Mr. Wessel, who is chairman of the board of directors of Aktieselkopet Borregard, Kristiania, Norway, a concern which controls the well-known firm of Kellner-Partington Company, Ltd., Manchester and London, is in America for the express purpose of inspecting representative paper and pulp plants on this side of the Atlantic. Aktieselkopet Borregard is the largest pulp and paper concern in Norway and probably in the world. It has mills in England, Norway, Sweden and Austria.

The natives of the Niger gather immense quantities of butter from the butter-tree. It abounds in such great quantities that it is likely to become an article of commerce.

(Continued from page 281)

float controlled belt tightener acting thereon, and connections between said tightener and the valve for opening and closing same. Claims allowed 6.—A.P.-C.

K-12. Felt guide for pulp and paper machines. Can. patent No. 204,677, FRANCIS FORD, Bromptonville, Que., Oct. 12, 1920. In a device of the class described, a closed upright receptacle having a movable lower portion, a column of liquid in said receptacle supported by the movable portion, and means for maintaining air in said receptacle above the liquid normally at a pressure other than atmospheric, means for regulating said pressure controlled by the position of an element to be guided whereby the movable portion of said receptacle will be moved in accordance with the difference in air pressure above the liquid column annd against the movable vessel portion, a roll engaging an element to be guided, and operative connection between the movable vessel portion and roll. Claims allowed 10.—A.P.-C.

K-12. Paper machine press roll. Can. patent No. 204,733, HENRY H. VAUGHAN, Montreal, Que., Oct. 12, 1920. In a paper making machine, a pair of press rolls, one of which is movable laterally to and from engagement with the other. Claims allowed 3.—A. P.-C.

K-12. Method and apparatus for drying sheet material. Can. patents No. 204,316 to 204,319 inclusive, OGDEN MINTON, Greenwich, Conn., U.S.A., Sept. 28, 1920. The method of continuously drying paper, consisting in passing the web of wet paper into a vacuum chamber through a liquid seal which has no affinity for said paper, drying, flattening, and smoothing said web of paper in said vacuum chamber to obtain a flat paper with a smooth surface, and then continuously passing said web of smooth, flat and dry paper out of said vacuum chamber through a liquid seal which has not affinity for said paper. Claims allowed 26.

204,317; The method of drying sheet material consisting in passing said sheet material through a liquid seal that has no affinity for said sheet material into a vacuum chamber, then passing said sheet material in folds or loops through a bath of heated metal in said chamber, said bath having no affinity for said sheet material, regulating the degree of tension, if any, of the sheet material in the folds or loops to control the finished product, and then passing said sheet material out of said vacuum chamber through a seal which has not affinity for said sheet material. Claims allowed 32.

204,318; Method of continuously drying sheet material, consisting in continuously feeding it into a vacuum chamber and passing the sheet material adjacent to a heated medium but not in contact with it, and withdrawing the sheet material from the vacuum chamber without breaking the vacuum. Claims allowed 34.

K-12. Automatic paper carrying device for paper machine. Can. patent No. 203,984, The Great Northern Paper So., Millinocket, Me., assignee of CHAS. POPE, Springfield, Mass., U.S.A., Sept. 14, 1920. In a paper making machine, the combination with a plurality of web supporting devices separated by a substantial distance, of means for automatically transferring a lead strip of the web from one of the said devices to the other against the influence of gravity, comprising app. for producing 2 adjacent substantially parallel air blasts, between which the lead strip is passed, whereby the blasts will guide the lead strip in a definite path from one of the said devices to the other, and a deflector against which the blasts are directed and which is curved to deflect the currents of air and thereby guide the lead strip in a curved path. Claims allowed 10.—A.P.-C.

K-14. Process and apparatus for seasoning and rectifying paper stock. Can. patent No. 204,527, GEORGE E. POGGELL, Louisville, N.Y., U. S. A. Oct. 5, 1920 The process of seasoning and rectifying paper stock consisting in blowing currents of heated air upwardly between the sheets while the latter are suspended within an enclosure and conducting the heated air after passage between the sheets, exteriorly thereof back to the point where it is blown between the sheets, thereby maintaining a cycle of travel of the air so that it is made to pass and repass between the sheets. Claims allowed 9.—A.P.-C.

K-18. Apparatus for winding paper cardboard. Can. patent No. 204,964, Jas. Spicer & Sons, Ltd., assignee of JAS. S. HOLMES, London, England, Oct. 19, 1920. Claims allowed 8.—A.P.-C.

K-18. Weather board. Can. patent No. 196,140, the Bestwall Mfg. Co., Chicago, Assignee of M. K. ARMSTRONG, Winnetka, Ill., U.S.A., Jan. 13, 1920. A weather board for roofing, siding, and the like comprising a base consisting of an intermediate porous plastic or rigid body and top and bottom coverings of paper adhered to said plastic or rigid body, a waterproof covering of asphaltum for the base, and a protective covering of crushed stone, tile, or the like, on the top covering of the base. Claims allowed 3.—A.P.-C.

K-18. Machine for making reinforced fiber board. Can. patent No. 204,024, B. G. DAHLBERG, assignee of T. B. MUNRO, St. Paul, Minn., U.S.A., Sept. 14, 1920. In a machine of the character described the combination of a tank, means for maintaining a head of water in said tank, means for giving said water mixed with fibers a swirling motion in said tank, a pair of travelling foraminous surfaces between which said swirling water and fibers pass, means for compressing said fibers as they leave said tank and surfaces, and means for supporting a travelling foraminous reinforcing material between said foraminous surfaces. Claims allowed 3.—A.P.-C.

K-18. Machine for making double-faced cellular paper-boards. Can. patent No. 204,728, GEO. W. SWIFT, Jr., Bordentown, N.J., U.S.A., Oct. 12, 1920. The combination of a series of mechanisms adapted to simultaneously corrugate paper web and apply facing sheets or webs upon opposite faces of the corrugated web and means for applying an equalizing tension upon the facing sheets or webs, with a drying table or support arranged tangential to the face-applying mechanisms in the plane of application and the second facing sheet. Claims allowed 12.—A.P.-C.

K-18. Fiber plaster board. Can. patent No. 204,705, CARL G. MUENCH, International Falls, Minnesota, U.S.A., Oct. 12, 1920. The process of making plaster board which consists in felting cellulose fibrous material to form a board having substantially rectangular ribs upon one of its surfaces, and subjecting said ribs while the board is still moist to the action of a plurality of sets of forming rolls to change said ribs to a dovetail shape, whereby a better plaster bond is secured. Claims allowed 6.—A.P.-C.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, March 5.—Unsettled conditions still prevail in the pulp and paper industry and business generally is dull, although increased business in some lines is taken as an indication that trade is about to pick up. Careful enquiry elicits the information that from the mills, down the line to the wholesalers, stocks are either piling up or have piled up to a point that makes it imperative to curtail production, which is taking place at most of the plants. Few of the pulp and paper mills are running full and the product in many cases is not finding an outlet. The market for both pulp and paper is distinctly a buyer's one with a downward tendency, with the result that practically all along the line there is a hesitancy on the part of the buying public to stock up until the market is beyond the chance of dropping to a still lower level. Price reductions are still taking place but they do not always attract trade. To the buyer they are indications that a deferred order will make him money if he waits for a still further drop in the market. The point has apparently not been reached where the printer and consumer have to have paper although that stage cannot be far away and when it comes it is the conviction, in some circles, that there will be nearly as much buying of paper as in the boom days. In the meantime the printers still complain of a dullness in trade with comparatively little work going through, which means that they are not buying paper. Add to these conditions the threatened competition of American paper houses, and it will be seen that all the business the Canadian mills and jobbers get in the immediate future they will have to dig for. American paper firms are doing a lot of direct mail advertising with Canadian paper houses and are offering book and other papers at attractive prices, although with exchange rates as they are the American houses have not seriously undersold the Canadian paper firms, but they are contributory causes to the unsettled condition of the paper market. As indicating the dullness in the printing and allied trades, it is stated that in Toronto some of the bindery departments have laid off hands and some of the printing staffs are running short time.

BOOKPAPERS.—The book paper trade has not yet got down to a stable basis and jobbers are in the position of not knowing just where they are at. Effective March 1st another cut of 10 per cent. went into effect on a number of lines of paper and there is speculation as to whether or not bonds and ledgers will undergo a reduction.

BRISTOLS DOWN.—The week saw a drop in Canadian-made bristol boards of three cents per pound, the price now ranging from 11c. to 16c. per pound, according to grade and variety. Cover paper remains firm in price and is unchanged.

SULPHITE DRUG PAPERS.—Further reduction went into effect last week in sulphite drug wrapping, the decline representing twenty per cent. Prices of tissues and toilets remain unchanged with a fair amount of business for the mills.

COARSE PAPERS.—Further reductions in the prices of coarse papers were arranged last week, to go into effect on Monday, March 7th. The reductions represent an average drop of two cents per lb. Grey brown and white wrap are down to 7c; "B" manila 7½c.; No. 1 manila 9c. and fibre $8.50. Kraft has been reduced from 11½c. to 10c. per lb.

PULP.—There is absolutely no market in pulp and no transactions are taking place. Mills that are manufacturing for their own paper as a rule are confining their operations to their own requirements and other pulp mills are stocking up. In a market where there is little demand pulp mill representatives are making deals in a competitive market and a paper mill can usually get five dollars a ton knocked off his quotation by negotiating with a couple or more pulp mills. Even on this basis very few sales are being made. Negotiations for bleached pulp usually start with a quotation of from $135 to $140 with unbleached at $95 to $100 and ground wood in an open market as low as $60 a ton. One theory advanced by a well-known pulp manufacturer for the unsatisfactory condition of the pulp market places a measure of responsibility on the paper retailer and publishers into whose hands, together with those of the consumer, the finished product ultimately comes. It is charged that the deflated prices of pulp are not passed along as they should be and that the retailer is charging as much for paper as he ever did, thus shutting out the general public from participating in the lower prices for raw stock and causing general dissatisfaction, with its reaction on the condition of the pulp market.

NO CHANGE IN THE PULP AND PULPWOOD MARKETS.

The identical conditions existing in the pulp and pulpwood markets are expressed by a stubborn deadlock which during the past three weeks has shown no indications of loosening up other than the possible danger that the "guage shift" of prices may spring into reverse from its neutral position. This bearish sentiment may be attributed to the following facts: In the first place, a great many paper mills, especially in the United States, who are dependent for their supply of raw material either as pulpwood, pulp or both have been idle in the past few months. At the time of closing down most of them had several months supply of raw materials on hand. Consequently, they are in that respect the same way off as they were then and therefore are not likely to want any more for some time to come. Those of them that have started operations are quite unwilling to pay the low prices now prevalent because they think that fair levels have not yet been reached. They also contend that production costs are too high to compensate them for the prices now offered for all papers in the paper market. Of course, there are some commodities which have come down, but present wages still offset any gains made by these cuts.

Taken as a whole, there has probably never been anything quite so complicated as the situation which makes itself felt, and very uncomfortably so. Prices are practically off any base and not a few figures



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that have been demanded, or offered, approached the ridiculous. Whether reports of such quotations are fabulous or really the unhappy result of chaos is hard to say. Many sellers in evident mood of distraction have sought the quickest but least practical way in which to liquidate their holdings. In cases of that kind the stories have it that these dealers departed with their pulp or pulpwood holdings for a price bordering on what might be termed "commercial suicide".

In all this sombreness there is, however, a ray of hope. A short time ago, rumors had it that German print paper was being dumped on the New York market at prices which far undersold that of any offered by North American dealers. It is quite possible for Germany to do this because a few cents can be translated into many marks. And this stunt would have met with success had the Germans been able to furnish publishers with newsprint of a quality that compares with that of the kind turned out on this side of the Atlantic. Before they can possibly hope to compete with the goods of the Canadian and American papermakers, it will be necessary for them to manufacture a print paper that can pass through the presses over here, without so many imperfections. One may ask why this should have anything to do with the pulp and pulpwood market, either one way or the other. As an answer it may be well to point out the fact that one of Germany's strong points in the field of industry has been her paper; but, of course, before the war. Their forestry methods have been such as to enable them to yield more per acre of pulp wood than other countries. Therefore, while they never went extensively into the foreign paper markets, it is reasonable to assume that such would be their object now when every effort has to be exerted to its fullest extent in order to help pay off the enormous debt which hangs over their heads. The probable reason for the inferior grade of German print paper may be traced to causes revealing shortage in such materials as are necessary for the production of a good sheet. From all of this it can easily be understood that there would be perceptible falling off of demand for any raw materials in this country, were Germany able to launch out on any large project along those lines.

A CONSERVATIONIST.

Lecturer (in loud voice): "I venture to assert there isn't a man in this audience who has ever done anything to prevent the destruction of our vast forests."

Man in audience (timidly): "I've shot woodpeckers."

NEW YORK MARKETS.

New York, March 5. (Special Correspondence).—All branches of the paper industry have continued to experience quietness this week. Manufacturers are operating their plants on greatly curtailed schedule; some are closed down tight, and few, if any, are running at full capacity. Jobbers report a decidedly slow demand for paper of every kind. Printers and other consumers are buying in cautious fashion, invariably confining present orders solely to supplies directly required, and it cannot be said that there is a concerted movement of paper of any grade in any single direction. Contract business constitutes the great bulk of trade activity. Publishers and other buyers of paper on contract appear to be getting along under prevailing circumstances without having to resort to fresh buying in the open market and there is little in the way of important business stirring in the spot market.

News print has again weakened in price. Sales of spot news in standard rolls at as low as 5 cents per pound have been reported, and if the assertions of newspaper publishers are to be relied on, there have been purchases effected even down to 4.50 cents. The spot market for print paper is distinctly weak. Few publishers are operating as buyers except in an occasional way when in want of an extra small tonnage to fill in contract shipments, and there is a surplus of paper on the market. The erratic condition of the spot market is having but little influence on the contract situation at present but it is obvious that if prevailing circumstances continue the effect on the contract market will be serious. There seems no denying now that the influx of news print from foreign sources was one of the basic causes making for weakness in the market here. Reliable estimates place German and Scandinavian news print importations into the United States for 1921 consumption somewhere between 100,000 and 200,000 tons. This is a comparatively small amount as against the tonnage of print paper consumed in this country, but it is ample to wage an important influence on the market.

The fine paper situation is marked by easiness and dullness. Buyers are absorbing but small lots of paper and are confining their purchases almost entirely to the low and medium qualities of bonds, linens and ledgers. Few high-priced lines are finding a sale today, and the aggregate demand made upon mills is not sufficient to keep them operating at even two-thirds full. Throughout mill centres in the New England district matters are reported very bad. Some plants are closed down tight; others are running

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but two or three days per week. Some of the most popular lines of bond paper are selling at prices denoting a decline of 7 to 8 cents a pound from the levels prevailing not so long ago. One of the most widely used water-marked brands of bond paper, which several months ago was hard to secure at 26 cents a pound, is today freely available at 18 cents at the mill. Prices on nearly every grade of fine papers have decreased in about similar proportion.

There is a fair demand for coarse papers. Domestic No. 1 kraft wrapping is moving in moderate volume at a price basis of about 8 cents per pound at mills, with No. 2 kraft quoted at 7 cents, and there is a relatively good call for bogus wrappings and other coarse papers. Tissues are quotably steady at around $1.75 for No. 1 white, and are marked by some activity.

Book papers are easy and mills with few exceptions are looking for business. Machine-finished book is quoted in the open market at 10 cents and less per pound, and contracts have been accepted by manufacturers at a cent per pound below this price. Increased weakness has developed in box boards. There have been sales of plain chip board in the New York market at as low as $30 per ton delivered this city and of filled news board at $32.50 delivered. Even at these prices consumers are absorbing little board. The situation is such that boxmakers do not require usual amounts of board and they are unwilling to anticipate forward requirements, feeling that it will to their advantage to pay more later on when they need board than to lay in stocks at today's prices while not knowing what the future will bring forth.

GROUND WOOD. — Ground wood continues in a dull and unsettled market position. Board mills are keeping almost entirely out of sight as buyers and other consumers are absorbing but light amounts of pulp, and in the absence of actual transactions it is difficult to figure out what definite market values are. Some of the foremost grinders in this country and in Canada are asking $65, and even higher, at producing mills for No. 1 spruce ground wood, but it is doubtful whether they are effecting sales at such a basis, because about the only business reported passing locally is at prices ranging between $45 and $50 per ton at mills. This would indicate that there is sufficient of the so-called "distress" stocks of pulp offered at present to cover buyers' wants, thus leaving producers who are asking higher prices out of the running.

CHEMICAL PULP. — There is little doing in the chemical wood pulp trade. Consumers mostly are indifferent and are staying out of the market except when occasionally they are in immediate need of a small parcel of pulp, when they come in and buy merely enough to supply actual wants. Prices are irregular and are at best nominal. An encouraging feature is that dealers and importers are not pressing matters. Most of them are adopting a waiting policy and letting the market run its course, presumably feeling that prevailing conditions cannot last indefinitely and that when consumers are in need of supplies they will come into view. Moreover, domestic manufacturers in many cases are curtailing their production during the present dull period, which is helping to prevent the piling up of a large surplus stock of pulp. Importations also are down to a minimum. Importers say they cannot buy at primary sources today with the hope of making a profit under prices prevailing here, and are limiting their operations to placing orders on the other side given them by mill customers.

RAGS. — The papermaking rag market is quiet and easy. Further declines have been recorded in prices on numerous grades, and the downward movement of values does not seem to have yet been checked. Mills are buying in very sparse amounts, and in frequent cases refuse to show interest in offerings regardless of the prices named. No. 1 white shirt cuttings have sold down to 13 cents a pound delivered mills, although dealers contend that a more representative market basis on this grade of rags is around 14 cents. No. 1 washables have sold at 6 cents f. o. b. New York, fancy shirt cuttings at 8 cents, new light silesias at 8.50 cents, and black silesias at 4.75 cents. Old rags are about as dull as are new cuttings, and current quotations are at around 8 cents on No. 1 repacked whites, 6.50 cents on No. 1 miscellaneous whites, 2.50 cents on repacked thirds and blues and $1 per hundred pounds on No. 1 roofing stock. Roofing rags are about the only grade wanted by mills in sizable volume, and there is relatively a much firmer tone to prices in this end of the market than any other.

PAPER STOCK. — Waste papers are in limited demand and the trend of prices is still downward. No broad changes on low grades have occurred because prices in this respect are down to levels where they can scarcely go lower, being at a point where packers insist they cannot produce stock and realize a profit. High grades, however, have sunk further, and sales of No. 1 hard white shavings have been reported at 4 cents a pound at shipping points, No. 1 soft white shavings at 3 cents, ledger stock at 2.25 cents and heavy No. 1 books and magazines at 1.40 cents. Folded newspapers are moving to board mills in restricted volume at around 55 cents per hundred pounds and No. 1 mixed papers at 40 to 45 cents.

OLD ROPE AND BAGGING. — A fair inquiry exists for old rope and paper mills are said to be absorbing comparatively good amounts at a price range of 4 to 4.25 cents per pound for domestic Manila rope in No. 1 condition. Old bagging continues to be neglected and prices are strictly nominal. Offerings of No. 1 scrap bagging at 1.50 cents a pound and of No. 1 gunny bagging at 2 cents at shipping points are meeting scant response.

CZECHO-SLOVAK PAPER PRODUCTION.

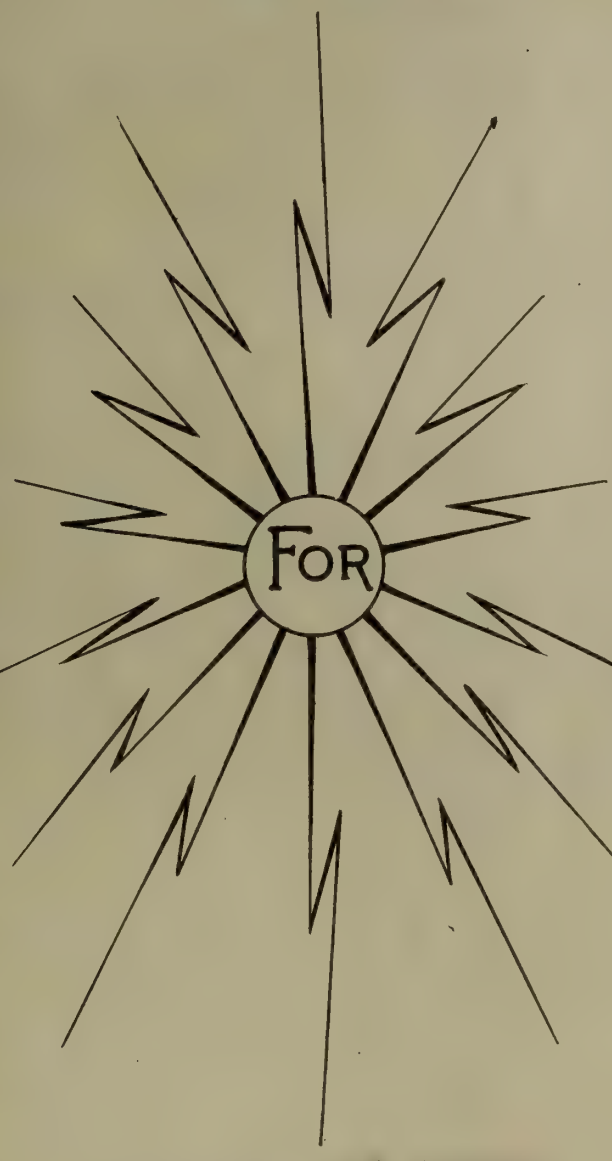
It is estimated that approximately 44.4 per cent of the paper produced in the former Austro-Hungarian Empire in 1913 was manufactured in the present territory of Czecho-Slovakia. According to the data of the Czecho-Slovak ministry of Commerce and Industry, quoted in the "United States Commerce Reports, there are 234 Czecho-Slovak concerns making paper and paper products; 85 mills make special grades of paper, 54 make cardboard, and 76 make pulp (9 manufactured chemical pulp). Before the war all these concerns employed about 17,000 workmen; at present almost 26,000 are employed.

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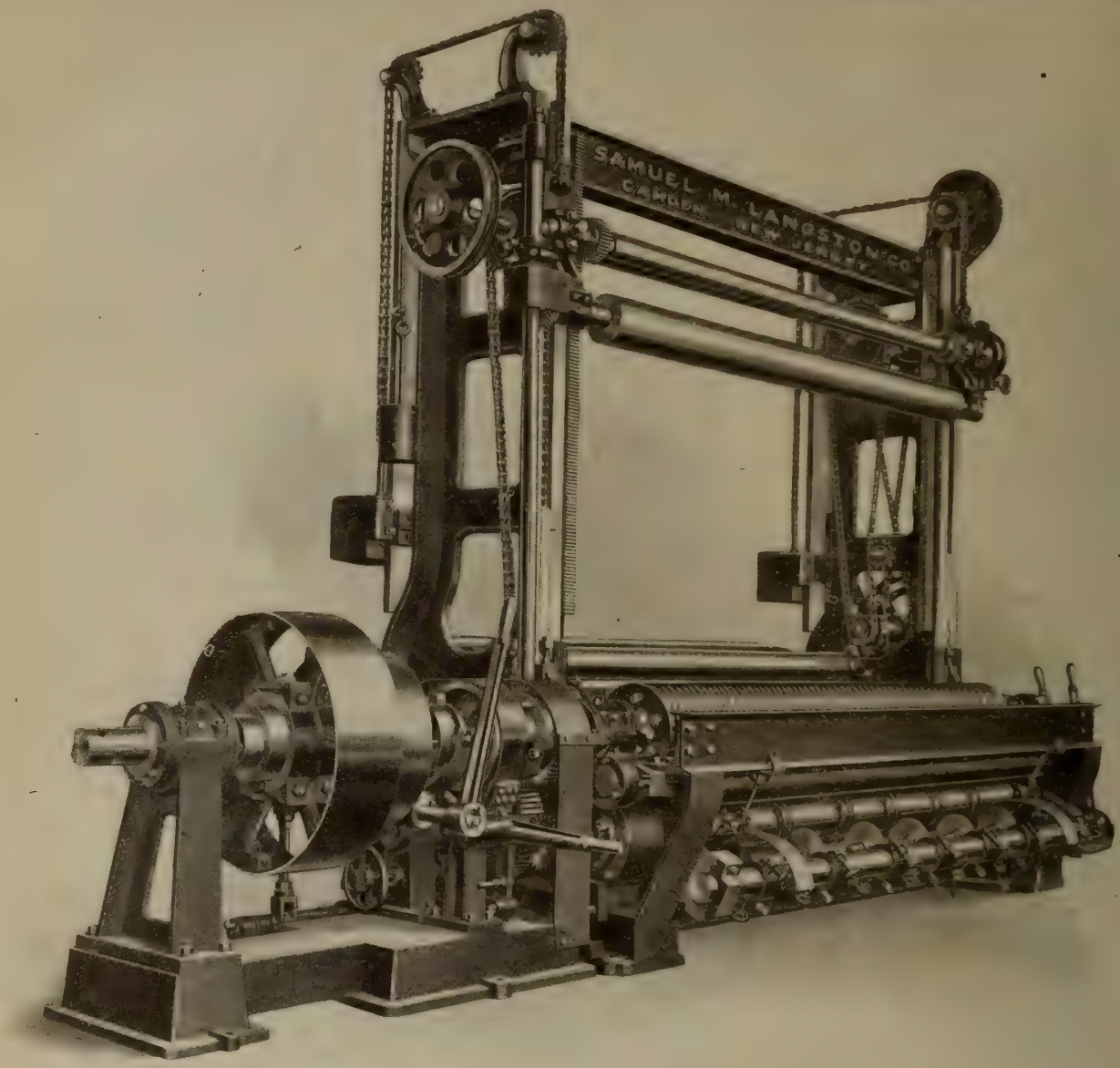
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VOL. XVIX. GARDENVALE, P. Que., March 17th, 1921. No. 11

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal,
'Phone Uptown 7773.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

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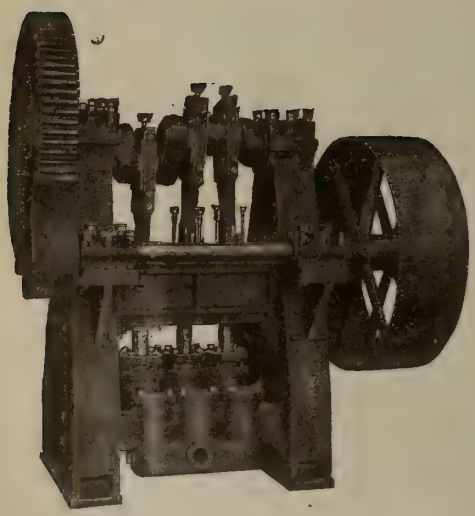
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EDITORIAL

THEY WANT MORE WOOD.

If the Province of Ontario or any one else interested in the matter wants a concrete illustration of the need for an accurate up-to-date survey and estimate of timber actually standing on pulpwood limits that illustration is provided in the application of the Spanish River Pulp and Paper Mills for an additional supply of pulpwood. This company operates three mills. It is understood that considerable extensions to one of these plants have been made on the assumption that pulpwood from a limit recently acquired would be sufficient to maintain the increased production. It is now discovered that the wood on this area is by no means adequate and the Ontario Government is now in the somewhat inconvenient position of having to grant additional limits or deliberately jeopardize continuous manufacturing operations by this mill. Thus several thousand Canadians, dependent on the mill for employment, are in danger of being out of work.

A similar situation developed but a short time ago with regard to the Lake of the Woods limit. This area was acquired by E. W. Backus and his associates with the understanding that a pulp and paper mill of certain size would be erected to use the pulpwood thereon but an inspection of the property after it was acquired showed that the timber thereon would not warrant the erection of such a plant. Steps were consequently taken which have resulted in the acquirement of the English River limits which will provide material for a mill to be erected at Kenora.

The two situations are quite similar. The Government, if reports are correct, sold what did not exist, namely pulpwood sufficient to operate the pulp mill for which the limits were bought. On the other hand, the companies apparently depended too much on the Government's estimate of available wood. The result has been somewhat embarrassing to the Province of Ontario and not particularly satisfactory to the companies. The whole difficulty as we see it, lay in the lack of accurate information or even approximately reliable information as to the amount of timber on these limits. It may have been foolish for a company to purchase without adequate inspection but as to the Province, we fail to see how a concern can hope to do business in a businesslike way without an approximately accurate inventory of its stock. This is just what our Governments are doing when they fail to determine the extent and value of their woodland possessions. A fairly accurate knowledge of available water powers has been collected and, once obtained, such data does not vary very greatly from year to year, whereas the condition of the forest is changing almost every month and certainly every fire season makes it essential that there be at least a new estimate of damage by fire, fungus, insects and wind and a correction of the forestry maps.

The perfection of the aeroplane leaves no excuse now for not entering immediately a fairly accurate statement of damage sustained each year so that there would be an up-to-date inventory of the timber stand on the various water sheds of each province. Comprehensive and especially prompt information of the rapidly changing conditions of our forest resources is absolutely necessary if we are to have a competent administration and proper development of this part of Canada's natural wealth. Occasionally a mill is located where the water power is insufficient and others are established or extended without entire certainty that the supply of wood is adequate for the continual operation of the mill at the capacity for which it is built.

If we are to maintain Canada's supremacy in the Pulp and Paper markets of the world we must maintain, without any chance of doubt, the proper balance between mill capacity and the re-production of the forest. In other words no one should be permitted to establish a mill whose capacity is greater than can be supplied by the annual growth of a forest area accessible to the mill and without express stipulation that this area shall be so operated that the mill shall use only such annual growth in its operation. The basis, therefore, of such administration of our forests is an adequate and an immediate inventory of their location, character and extent.

THE CANADIAN AUTHORS' ASSOCIATION.

Mention was made in our last issue of the convention of authors, called at the instance of the Canadian Bookman, in Montreal last week. It was a success in every respect. At the banquet on Friday night were ninety-six literati (if our Latin is correct, but to be sure, we'll call them writers). Saturday's session saw the formation of the Canadian Authors' Association. Lest anyone should look on such an organization as merely a "Mutual Admiration" or "Tea Tipplers'" society, we need only mention that Canadian authors are vitally interested in one of the most puzzling problems before Parliament, the matter of legislation regarding copyrights.

Several bills, which have been introduced, have not been enacted, and a new bill will soon come up for the second reading. The question is complicated by the number of conflicting interests affected; among them are, besides the author, the publisher, the labor element, phonograph, pianola, and film companies and, finally,

the reading public. Such a situation is only solved by a compromise. Up to this time the author has not been able to speak through an organization, as is the case with some of the other elements interested. This disadvantage is well met by the appointment of a committee consisting of R. J. C. Stead and Miss Madge Macbeth of Ottawa and Arthur Stringer of Chatham, Ont., to act jointly with the executive of the Authors' Association with regard to the Copyright Bill. No one element can hope to have all the benefits possible from legislation, but a committee representing such an association can do much to avert actual injustice.

The convention was considerably agitated in trying to define "author". We are not sure yet whether an ordinary periodical "pen-pusher" is an author and whether his work is "literature", but one can never predict what blossom will grow from an unpromising bulb.

Our town of Ste. Anne de Bellevue was honored in the selection of Mr. J. Murray Gibbon, as president. Mr. B. K. Sandwell, who recently resigned as managing-editor of the Journal of Commerce was elected Secretary. This historic town is really quite a hot bed of literature, of budding authors, as it were. Mr. Gibbon has written several novels, including "Drums Afar" and "The Conquering Hero"; Capt. Frederick William Wallace is the author of "Blue Water", "The Shack Locker" and "Viking Blood"; Mr. J. J. Harpell compiled "Canadian Commerce, Industry and Finance", Prof. Lynde wrote "Household Physics", and other members of the MacDonald College Faculty have contributed to Canada's already enviable record. This does not complete the list, but will show that it is not inappropriate for the Industrial and Educational Publishing Co., to launch the Canadian Bookman and provide motive power for a while. The time will soon come when the reading public appreciates what Canadian authors have for them to enjoy. It is to encourage the development of Canadian literature that the Canadian Bookman is published.

COBWEBS.

Pulp mills in Wisconsin are getting wood faster than they can handle it, at $11 to $18 per cord for hemlock. There will evidently be plenty of pulp, but the price of sulphite cannot very well go much lower without meeting the cost of manufacture. Pulp mills realize that they cannot sell pulp to a paper mill which cannot use it because the jobber cannot buy the paper so long as the public refuses to purchase. It is a modern version of "'The House that Jack Built." In this case we want an economic structure built on firmer confidence in the stability of Canadian and American business.

Canadian contracts for exports of newsprint are practically all on uniform basis now with Spanish River and Abitibi quoting 5½ cents for the next quarter.

HE WAS HUMAN.

He was human, but, Oh, so thoughtless.

He awoke to the jarring note of an alarm clock, not made in Canada.

Then he shaved with soap, brush and razor, which were imported. So habit sent his money to another country.

Feeling that the morning was well started, he ate a hearty breakfast, consuming pancakes and a pet brand of coffee bearing labels of an outside manufacturer, and then was ready for the day's work.

Arriving at his office, he found a batch of morning mail awaiting his perusal. Some of these contained offerings from many points of the compass and he seized upon one or two presenting bargain prices and profit possibilities and overlooked the fact that importation of such material was working against his country's trade balance.

Routine work completed the morning up to the time of signing his first mail, before he went to lunch, and this now engaged his attention. He did not know the watermark on his letter paper. If he had raised it to the light, he would have found it did not show the "Beaver S" and that it was not "Made in Canada."

Having signed his letters, he went to the club for lunch and engaged in a serious discussion with his friend as to the wonderful trade possibilities ahead of Canada.

After lunch, having previously forgotten it, he went to his bank and asked for a draft on New York for several hundreds which he was to send his wife, about to return from Florida.

An explosion soon followed. The premium on New York funds had recently made a big jump. He was mad, then madder, and, finally, he was red roasting hot. To pay such a price for the mere privilege of spending money had aroused a violent oscillation in his brain—a condition in which man is better silent than otherwise.

Later he returned to his office.

But wasn't he human?

Just a bt thoughtless, perhaps. — From "The Crest".

A. P. & P. A. MEETINGS IN APRIL.

The official call for the Forty-fourth Annual Meeting of the American Paper and Pulp Association is just going out from the President of the Association. This letter is going to over one thousand men having to do with the manufacturing, converting and merchandising of paper in the United States. It is probable that the Annual Meetings of April 11-14, 1921, will see the greatest gathering of the paper industry ever held in New York City.

Problems of the greatest importance to the paper industry will be discussed at this Annual Meeting of the American Paper and Pulp Association, and at the various annual meetings of its affiliated organizations. Questions dealing directly with the specific business of manufacturing and merchandising paper will be discussed. It is a time for the paper industry to get away from generalities and to make these meetings the place for plain talk as to conditions concerning the industry.

It takes a wasp to make a lazy man get a move on himself. All it has to do is to back up against him and push.

Steam Power in the Paper Mill

A discussion of the means of securing high efficiency in the generation and use of steam by the correct selection and application of steam specialties.

By H. J. BARTLETT, Crane Company, Chicago.

Of recent years the belief has been frequently expressed that hydro electric plants will soon become the chief medium of developing the power used in all our larger industries. There is no question as to the low cost of power generated by such plants, but when the cost of transmission and the overhead charges are taken into consideration the economy is not so evident and may be completely neutralized. For example, at Niagara Falls is located the largest water power development in the United States. For years the low cost of electricity in that region has been so well known that many large industries have located near the Falls. And yet, just recently, a steam power plant has been put into operation at that point which delivers a kilowatt hour at the switchboard for less than it can be produced by the water power plants. It, therefore seems reasonable to believe that, while hydro electric power will be an increasingly important factor in paper mill operation, steam will always be the primary medium for developing power and supplying heat for the various paper making processes.

To successfully operate a steam plant which will compare with a hydro-electric plant, it is necessary that the entire system of generating, conducting and using the steam be maintained at its highest commercial efficiency at all times. What that commercial efficiency is depends largely on the correctness of the original design and the care with which the various equipment was selected for the work it was to accomplish. It is not necessary to go into the design of power plant apparatus, for in nearly all cases it will be found that such equipment is capable of an efficiency far beyond that possible to attain in ordinary usage. To select this equipment correctly and maintain it on its original plane of effectiveness is a very important feature of power plant work.

Starting in the power house, we find that boiler losses are many and in some cases unpreventable. For instance, the heat losses in the chimney gases, the losses in heating the moisture in the coal and the losses in heating the moisture in the air entering the furnace are all inherent and as such cannot be avoided. Such losses are due to air leakage around the boiler setting, poor boiler covering, scale and soot on the tubes, insufficient or excess air supply and poor damper regulation are preventable and should be given the closest attention of the operating force. There are, however, a number of other losses incurred in operating the average boiler plant which are seldom given any recognition.

Take, for example, the matter of pop safety valves. This valve is, beyond question, the most important valve on the boiler. Its purpose is to permit, automatically, the escape of steam to the atmosphere if an excessive pressure is reached in the boiler. The increased horse power, high pressure and temperature of modern boilers has made it necessary to design pop valves suited to the new conditions, which require valves of great relieving capacity and extreme sensitiveness to excessive pressures. The old-fashioned lever and weight safety valve has become obsolete for any save low pressure work, and the type of valve in which boiler pressure is resisted by a spring is rapidly supplanting all others.

The desirable characteristics of any pop safety valve are:

1. High discharging capacity.
2. Small blow-down or difference between the initial and final pressure.
3. Minimum waste of steam.
4. Absence of wire-drawing at the seat.
5. Prompt seating without hammering.
6. Interchangeability of parts.

In addition, the valves should be equipped with some method of regulating the blow-down so as to prevent unnecessary waste of steam. Valves with the spring outside the valve body proper give superior service over those having an inside spring, as in the former the spring is not exposed to the deteriorating effects of the high temperature steam.

The Boiler Code of the American Society of Mechanical Engineers requires that all power boilers having a capacity in excess of 2,000 pounds of steam per hour shall be equipped with two or more pop safety valves. It can readily be demonstrated that the use of two small pop valves is an economy over the use of one large valve. For example, suppose a boiler working at 100 pounds pressure requires a 4½'' pop valve set at 105 pounds. Every time this valve pops it discharges 145 pounds of steam per minute. Now, assuming that two small pop valves were used, we find that two 2½'' valves are sufficient to handle the required amount of steam. One of these could be set at 104 pounds and the other at 105 pounds or 106 pounds. When the 2½'' valve pops it discharges 80 pounds of steam per minute. Thus, if the valves blow for thirty seconds, the big valve wastes 72 pounds of steam and the small one 40 pounds, a saving of 32 pounds of steam at every pop in favor of the small valve. Assuming that 6 pounds of water are evaporated or made into steam per pound of fuel, this means a saving of 5 1/3 pounds of coal at each pop. With two poppings a day — a conservative figure — and 365 days a year, there is a saving of approximately 4,000 pounds of coal a year through using two small valves rather than one large one.

There are further advantages in using two safety valves instead of one. It is easier to keep a small valve tight. There is less danger of lifting the water in the boiler if the valve should pop when the water level is high. Two valves double the safety factor in plants where there is considerable scale in the water. Furthermore, firemen will regulate the drafts more readily in an endeavor to prevent the second valve from blowing after the first has popped.

Another of the large sources of waste around a boiler is the blow-off line. Due to the nature of its work, a blow-off valve is much more likely to cut out (score) than an ordinary valve, as it must handle gritty water, scale and other boiler impurities. For that reason they should always be made extra heavy, with renewable seats and discs. It is advisable to have the seating surface away from the path of the sediment and scale and to provide some means of cleaning the seat. The only way to insure an absolutely tight blow-off line, of course, is to use a two-valve combination, or cock and valve. By this method it is possible to keep one valve tight at all times and the resulting saving in coal will pay for the extra valve and the cleaning and grinding necessary. In blow-off work, valves should always be installed with the

pressure on top of the disc. It should always be borne in mind that it costs money to heat feed water and pump it into a boiler, and that any waste through the blow-off lines is a distinct loss.

In supplying feed water to a boiler too little attention is paid to the fact that the hotter the feed water the greater the efficiency of the boiler.

Theoretically, ten degrees rise in the temperature of feed water gives one per cent saving in fuel. Practically, the use of very hot water adds to the life of the boiler, reduces the amount of scale inside the boiler and reduces the cost of the upkeep. Feed water heaters, using exhaust steam from the engines, will supply water up to 250 deg. F., and economizers, utilizing the waste heat in the flue gases, will heat the water up to 350 deg. F. Unless there is a considerable head on the suction line to the pumps, however, there will be considerable difficulty experienced in pumping water at a temperature in excess of 200 deg. For this reason it is seldom, indeed, that a paper mill is found in which the feed water temperatures are above 230 deg., and the average is nearer 180 deg. Nevertheless it is entirely possible to feed boilers with water up to 400 deg., if the correct apparatus is used.

Ordinarily in plants where a large amount of condensation is returned to the boilers it will be advantageous to install a direct return trap system. Consider for a moment the temperature of steam at various pressures. At 10 lbs., pressure it is 240 deg.; at 50 lbs., it is 298 deg.; at 100 lbs., it is 338 deg., etc. So long as the condensation at these various pressures is kept from venting to the atmosphere it will retain its original heat, minus an unimportant loss by radiation from the piping. In the direct return system the condensation returns to the boiler through a closed system of piping in which no atmospheric vents are used. That is to say, if the condensation comes back to the boiler room at 338 deg. it is fed into the boiler at practically that temperature. Furthermore, all the heat drawn from the boiler for the operation of the system is returned in the feed water. The only loss incurred is from direct radiation.

The operation of this system is simple in the extreme. All condensation is returned to a large receiving tank placed well over the direct return trap, which in turn is 4 ft. or more above the water level in the boiler. Water flows into the trap tank by gravity from from the receiver through a swing check valve. During this period, all the accumulated steam in the trap tank is vented through a positively operated vent valve back into the receiver, where it gives up its heat to the incoming condensation. As soon as the weight of water in the trap tank is sufficient to overcome the counterbalance, the tank tilts to the bottom of its yoke. In doing so, it closes the vent valve and opens the steam valve which is directly connected to the steam space of the boiler. As a result of this operation, the steam pressure in the boiler is transmitted to the trap, and closes the inlet check valve. Water will then flow from the trap to the boiler by gravity. As soon as the tank is emptied, it returns to a filling position, closing the steam valve and opening the vent. It is then ready to begin another cycle.

In addition to the saving made due to the higher temperature of the feed water used, there is a further saving to be made by the use of this system instead of a feed pump. Direct acting pumps as a class are wasteful of fuel and low in efficiency. The average small duplex boiler feed pump uses in the neighborhood of 200 pounds of steam per horse power with a mechanical efficiency around 50 per cent. At these figures, the pump uses close to 10 per cent. of all the steam generated by the boiler. The steam cylinder on a pump is usually two and one-half to three times the volume of the water cylinder. This means that for every cubic foot of water fed into the boiler approximately three cubic feet of steam are required. On the other hand, in the direct return trap the amount of steam required is the same, volume for volume, as the water displaced and fed to the boiler. The saving in steam used is obvious.

Considering the steam piping from the boiler, it is becoming increasingly necessary from a safety standpoint to use non-return valves on each boiler when two or more are connected to a common header. These valves are designed to cut out the boiler on which they are placed in the event of a tube or a manhole gasket blowing out and thus lowering the pressure sufficiently to cause a back flow of steam from the header. They also regulate the flow of steam from the boilers to the header so that in firing each boiler maintains the proper pressure. Should one boiler, due to incorrect



THE Y TYPE STEAM VALVE.

or careless firing, drop in pressure, the non-return, or stop check, valve will cut out this boiler until it reaches the correct pressure. Each boiler must, therefore, supply its full quota of steam and this means increased efficiency.

Without these valves on the boilers, the problem of cutting a boiler into the header became a serious one. The usual practice was to have the pressure inn the boiler being cut in somewhat in excess of that in the header. In many cases, the boiler was fired up until the pop valves simmered or blew. This resulted in a needless waste of steam. Stop-check valves will cut themselves into the line automatically as soon as the pressure in the boiler equals the pressure in the header.

In the design of valves of this type, extended experiments have demonstrated that those having the minimum number of moving parts are the most desirable. All internal weights, levers, springs, dash pots and the like should be avoided, as they have a tendency to wear and work loose and thus obstruct the operation of the valve. It has been found that valves of the "Y" pattern type, with the discs inclined at an angle of 45 deg., allow smooth travel of the moving parts so that reasonably heavy discs can be used without cumbersome cushioning devices. By using a throttling lip on the disc the use of a dashpot is almost entirely done away with, as the disc must lift the length of the lip before steam begins to flow, and the disc and seat are then so far apart that there is no danger of hammering or chattering of the disc. It is also advisable to see that the operating parts of the valve can be removed from the valve body without taking the valve itself out of the line, as this will greatly facilitate making repairs.

It is very important when selecting stop-check valves to see that the proper size is used. Too large a valve causes chattering, pounding and rapid wear of seat and disc, even in the better type of valve. A valve too small

offers too much resistance to the flow of steam and will result in a large pressure drop between boiler and header. Too frequently in past practice the size of the opening on the boiler has determined the size of the piping used. Modern practice indicates that stop-check valves based on an approximate steam velocity of 4,000 ft. per minute at nominal boiler rating will give the most satisfactory service.

The advent of high pressures and superheat is responsible for the elimination of many of the older systems of piping, the tendency being toward greater uniformity of design. In any system of piping, the fundamental object is to conduct the fluid in the safest and most economical manner. The material used should be the best obtainable and the system so flexible that a break down in one element will not necessitate the closing down of the entire plant. It is a safe general proposition to say that the best pipe and fittings irrespective of first cost will prove the most economical in the end.

Modern practice tends to make all main steam headers as short as possible, as small in diameter as practical, and with the minimum number of joints. A single piece header, preferably cast because of its high factor of safety, connected to the boilers by long radius pipe bends, will give the best results with minimum loss through radiation and leaks. With properly designed bends, all expansion strains may be taken care of and this further reduces the opportunities for leaks at the flanges. Each apparatus of any nature requiring a large amount of steam should have a separate lead out of this main header and each lead should be valved off with an outside screw and yoke gate valve. Long steam lines leaving the header and passing from one building to another or through tunnels, should be protected with line protection valves operating on the velocity principle. Such valves will automatically close should a break occur in the line and thus prevent a large waste of steam as well as protecting workmen in the buildings through which the line passes.

Connections from headers to engines should always be made with pipe giving a steam velocity of not less than 6,000, and preferably 8,000 ft. per min. The cost of the reduced piping plus a large receiver separator is in many cases less than the cost of larger piping and a standard steam separator. This is particularly true if the difference in the cost of the pipe covering is taken into account. With the smaller piping and the large receiver, condensation is reduced to a minimum, vibration is eliminated, and the number of leaky joints is reduced.

In a great many paper mill plants pipe line drainage is not given the attention it deserves. Traps, when used, are of the cheapest kinds; discharge piping from the traps runs to concealed locations or hot wells and is never inspected. It is really remarkable what a saving in coal consumption can be made if traps are regularly inspected for tightness and the condensation so piped from the traps that none of the heat is lost. If the condensation is in sufficient quantity the best place to put it is into a direct return trap system such as was described in a previous paragraph. It must be borne in mind that there are a number of places in which open drip lines should be installed, or equipped so that they can be tested. For instance, the stop-check valve, the gate valve next to the header, and the water column should all have open blows or test connections. All other bleeder lines or drips should go to traps. A later paragraph in this article will discuss the different types of traps and their advantages and disadvantages.

Steam from boilers not liberally provided with superheating surface usually contains an amount of moisture varying from 3 to 5 per cent. under normal conditions. If the boiler is poorly proportioned or forced far above its capacity this percentage may be greatly increased. In addition, the condensation in the pipe line further reduces the quality of the steam (per cent of water in form of gas), the amount of the reduction depending on the length of the line and the efficiency of the covering. The effect of this water is varied. It increases the density of the steam and reduces its elasticity. It also increases the conductivity so that more heat is absorbed from the walls of the steam cylinders and discharged into the exhaust without doing useful work. If the water accumulates in large quantities, material damage may result to the engine.

To eliminate these harmful effects, it is essential that the water be removed from the steam before entering the engine. To accomplish this purpose, separators are employed of various types and principles. Whatever the type or principle, however, the proper requisites of a good separator are high efficiency as a water extractor, ample storage capacity for any sudden influx of water, simplicity and durability of construction, and small resistance to the flow of steam passing through. Many separators possess some of these qualities, but the number that possesses them all is limited.

It is a well known fact that the efficiency of separation decreases as the velocity of the steam increases. For that reason, separators should be of large area. But reduction of velocity alone will not produce effective separation unless the entrained water in the steam is brought into contact with a surface to which the water may adhere. The ideal way to accomplish this is to provide corrugated baffle plates with the corrugations inclined in such a way that the water is rapidly drained from the surface, preventing the steam from again picking up the water already separated. Baffles in horizontal separators should extend completely across the separator, thus preventing steam carrying water from escaping past the plate. In separators of this type, the steam, on entering, strikes the baffle with greatly reduced velocity and after losing the entrained water passes over the top, guided by the curved walls of the head and is deflected against the opposite side of the baffle before passing into the main. It will be noted that the steam rises to the top of the separator while the water is drained to the bottom. This is a very important point, for no matter how efficiently the water is removed from the steam, the entire benefit of the separator is lost unless the water is kept from contact with the dry steam.

No separator is effective unless means are provided for automatically removing the accumulated water of condensation. The most practical way of doing this is by the use of properly designed steam traps.

Since a trap is primarily a device for automatically opening and closing valves, it follows that the method used in performing this function is its distinguishing characteristic. On this basis all traps belong to three general classes, which we will call for convenience, the buoyancy, the expansion and the tilt. Each of these classes has numerous subdivisions, but the principle of operation for all the variations of each class is the same.

In the buoyancy type, the movement of the valves is controlled by a float, either open or closed, which rises

and falls as the condensation flows to the trap and is discharged. All buoyancy traps are of the continuous discharge type, that is to say, the valves are open, or partially open, so long as the flow of condensation continues. If the trap is properly selected for size, it will reach the point of maximum discharge with its valves wide open only when an abnormally large amount of condensation reaches it. During normal operation the valves will be only partly open.

The expansion type depends for the operation of its valves upon the expansion of a metal or some volatile fluid. In this type the valves will be wide open so long as condensation flows to it, but will shut off when steam reaches it. Due to its method of operation, the movement of the valves is necessarily slow both in opening



STEAM SEPARATOR.

and closing. It has no storage space for water and consequently the valves are working continuously.

The tilting trap relies for the power to move its valves upon the action of the trap tank in tilting when the weight of water it contains is sufficient to overcome its counterweight. This type of trap is intermittent in its discharge and has valves which open and close quickly.

Any valve controlling the movement of water has a tendency to cut out at the seat and disc when partially open. Trap valves in particular are subject to excessive wear due to the high velocity of the water passing through them at the pressures ordinarily encountered in trap work. The wearing action of water at comparatively low velocities needs no illustration here; its effect is multiplied many hundreds of times if the water is hot and under high pressure. The only successful solution of this difficulty is to open the valve wide enough to remove the disc from the path of the water. If it is possible to make the opening of such a size as to reduce the velocity of the water passing through it, the wearing effect will be still further reduced. Normally, as has been noted, the buoyancy trap valves are in a partially open position if the trap is of sufficient size to handle the slugs of water that are bound to come to it from time to time.

Under these conditions, the valve disc is directly in the path of the water being discharged. Instead of having the velocity decreased through the valve, it is greatly increased due to the fact that traps of this type must have small valves or the float will not have sufficient power to move them against the steam pressure in the trap. Thus the normal cutting action at the valve is greatly increased in traps of this type. Experience has proven this statement true beyond all question.

In the expansion type trap the valves move slowly. Instead of being carried quickly beyond the reach of the rushing water they move so slowly as to greatly increase the inevitable wire drawing effect between the seat and disc. While the expansion trap can be made to operate intermittently it is impossible to give its valves the snappy opening and closing required for good trap work. Due to its lack of storage capacity the valves are moving continuously and the wearing effect is therefore noticeably increased.

In the tilting trap the valves are always wide open or closed depending on whether the trap is in a discharging or filling position. The movement of the tank is rapid in going from one position to another and consequently the valves open and close rapidly. However, unless they are designed to be of the balanced type or actuated by some force aside from the tank motion, they will have the same defect of increasing rather than decreasing the velocity through them. Any increase of velocity will have the effect of increasing wear and reducing discharging capacity. In this type of trap, it is possible to so design the valves that they will be completely out of the path of the water, the velocity over the seat will be decreased, and the discharging capacity will be equal to the amount of water that can come through the inlet pipe.

In general it would seem that all the desirable features of perfect trap operation are centered in the tilting trap alone, providing it has been carefully designed. Experience has proven this to be true. Both expansion and buoyancy traps while low in first cost are by far the most expensive when figured on a basis of cost per pound of water handled.

Their valves cut out with great rapidity. Since they have no moving parts exposed defective valves are not easily discovered and consequently the waste of steam through them is inordinately large. Too much attention in the past has been paid to price, and not enough to capacity which is primarily a function of good valve design.

The need for automatic devices to reduce and regulate properly steam or air pressure has increased great-



A TRAP OF THE TILTING TYPE.

ly with the prevailing use of high pressures and the increase in process work. Not all power apparatus is adapted for high pressure nor is it economical to use a greater pressure than that actually required to do the work. Wherever it is desirable to accomplish reductions in pressure, a regulator should be used. Such valves are adapted for use with engines, pumps, turbines, paper machines, vulcanizers, cookers, dryers and various other process work.

The nearer correct the regulator is to the required size, the longer it will last. The best service will be obtained from a valve that is practically wide open all the time when steam is being used. If it is too large for the service required, it will supply steam in surges or by throttling, thereby causing wire drawing through the

valve and pulsations in the line. If it is too small, particularly on low pressure work, it will dance and chatter and soon wear out. The best results can be obtained when the purchaser gives the manufacturer all the service data explaining the use of the valve and then selects a valve based on the manufacturer's capacity tables. Pipe sizes alone should not be considered in determining the proper size of valve.

The cardinal points in the design of a regulating valve are reliability, simplicity of operation, accessibility for inspection and convenience in making repairs. It is entirely possible to make a valve in which the body acts only as a container for the operating parts. The advantage of this construction is that the valve can be repaired without being removed from the line. Furthermore, should the moving parts wear out, as they inevitably will, it then is a simple matter to insert new parts and obtain practically a new valve at minimum expense and trouble. It is also desirable that the valve be so designed that it can be inspected while under pressure, as this will greatly reduce the delay incident to locating the source of any trouble.

Nearly all paper mill plants have one or more back pressure valves. Too little thought has been given in the past to selecting the proper type of valve for this service. Generally it may be stated that all back pressure valves should be of the positive seated type. Any of the balanced seatless type are wasteful for a number of reasons. In the first place, they leak steam. On a 10" seatless valve operating at 3# back pressure, the leakage amounts to 100 pounds of exhaust steam per hour, which equals the heat value of 11½ pounds of coal burned in a boiler operating at 70 per cent efficiency. On a plant running 24 hours a day and 365 days a year, this loss would amount in a year's time to 50 tons of coal.

Another source of waste in the seatless type of back pressure valve is due to the fact that these valves have no definite opening and closing points. When installed in an exhaust line they perform the same function as the safety valve on a boiler; that is, they relieve any excess pressure beyond that at which they are set. Assuming that a seatless type valve is used, set to relieve at 5#, it frequently happens that the valve does not close until the pressure drops to 2#, which ordinarily takes a minute or more. Under these conditions, a 10" valve would discharge 110 pounds of steam per minute at 5# pressure, whereas if a positive seated valve were used, it would relieve the system and close in 15 seconds, thus saving 82 pounds of steam per minute. This amounts to 7,500 pounds of coal per year, figuring two blows per day and 365 days per year.

It is a common thing in many paper mills to find all the large pipe lines covered and the smaller ones bare. This practice is undoubtedly due to ignorance of the vast amount of heat that can be lost through radiation from small pipe lines. For instance, one square foot of bare pipe, carrying steam at 100# pressure, radiates the heat from one-third of a ton of coal per year. This means that at this pressure 9 ft. of 1" pipe, not covered, will waste one ton of coal per year. To conserve as much of this heat as possible, every foot of every pipe line carrying steam should be covered with a high-grade insulating material. Not all pipe coverings have the same efficiency and the manufacturer of such material should always be consulted before purchasing. Because covering is white and looks nice on the pipe does not mean anything. The better the quality of the covering, the longer it will last and maintain its insulating efficiency.

THE CAP THAT FITS OR "PAPER AS IT IS MADE."

"Gerald, dear," said my wife the other evening, "I wish you'd write and order some more notepaper; we've hardly any left."

"All right, Margaret. What sort do you want? The last was beastly—too thick to make into spills and not large enough for drawing up the fire."

"Well, here's a list of the different kinds they have in stock at Jones and Robinson's."

I took it from her and glanced through it. "What do you say to 'Cream Laid,' Margaret? I like the sound of that. It will make me so nice and cool in the hot weather to think of the rows of fresh-faced country girls, in their spotless white overalls, pouring the cream delicately over the paper. I wonder how they get it to stop exactly at the edge?"

"It wants a very cool head and steady hand, I expect," said Margaret; "they'd all be picked cream layers, of course. But how would you like thick hand-made paper with deckle edges. What are deckle edges, I wonder; and how is paper hand-made?"

"Rather like treading grapes, I fancy, only that's done by foot. I mean they smash up the pulp with a very heavy pestle in a huge—"

"Mortar!" cried Margaret triumphantly.

"Yes; but am I telling this story or are you? Well and then they put it through a mangle—"

"Wurzel," said Margaret.

"Wrong, just a mangle, and roll it out flat, after which they deckle the edges."

"But how do they do that, Gerald?"

"Oh, they just call in the edge-decker and say, 'See to't that yon edges be deckled ere set o' sun,' and he sees to't. His is a most important post, I believe."

Margaret came and sat on a tuffet by my chair.

"Sorry about wurzel," she said. "Now tell me all about machine-made paper, there's a dear. It will be so nice to be able to tell Nat when he's older."

"Paper-making by machinery, my dear," I said graciously, "is a most complicated process. I won't puzzle you with all the details, but roughly—the idea is to pulp the — er — rags and so on in a huge sort of — er — bowl, and then to roll it out thin in the rolling out machine."

Margaret thought this over. "It sounds just the same as the hand-made," she said.

"Oh, no," I said quickly, "it's all done by machinery you see. Pistons and rollers and—er—mechanical edge-decklers and so on."

"And what does 'Linen Wove' mean?"

"They employ people to thread the paper with linen threads, my dear. A very delicate performance; that's why Linen Wove is so expensive. Azure Wove is, of course, done with blue flaxen threads. Silurian Bond is made by a fellowship of geologists, and for Chelsea Bank they have a factory on the bank of the Thames at Cheyne Walk. That's all I need tell you, though I know a lot more."

"I never realised before how awfully interesting paper-making could be, order me a good supply of Chelsea Cream Wove, will you dear? Oh, and some other kind for yourself, to write your stories on. Don't forget?"

"Very well; Chelsea Cream Wove for you. And what shall I have?"

Margaret's mouth twitched a little.

"Foolscap, I think, dear," she said. — (From "Punch.")

News From Europe

(Compiled by Dr. Paul Bartholow.)

Bolshevist Propaganda.

According to a French journal Bolshevik commissioners charged with the dissemination of Soviet doctrines are gathering up all the stocks of paper in Finland, putting their hands not only on present supplies, but assuring themselves of the future. By an odd paradox, says the French paper, a bourgeois State is furnishing a government which is an enemy of all bourgeoisie the elements necessary for its propaganda.— Le Courrier du Livre, February, 1921.

Sweden and Canadian Competition.

The wood pulp market is still in the hopeless condition of being without any demand worthy of mention. The English paper makers have considerable stocks on hand, while, on the other hand, the greater number of mills have restricted operations to one-third for lack of orders. The wood pulp market is like a sick man who has taken too much medicine, that is, bought much more than he needs and must therefore be left in undisturbed quiet. To offer pulp at lower prices only irritates the paper maker and has a depressing influence on the market without leading to any business. With regard to France and Italy the course of exchange in francs and lire exercises an unfavorable influence on shipments to those countries, the industries of which are out for German competition. Even the American markets make less favorable reports of activity in the paper mills. The result is that English firms are studying the possibilities of large sulphite and groundwood stocks in Canada. Yet if prices of coal, pulpwood and other materials for paper-making continue to fall in Sweden the Swedish mills need not for the present anticipate a great increase of competition from Canada. Cost of cellulose and groundwood in Canada have also shown a sufficiently distinct tendency to rise.—Svensk Pappers-Tidning, February 15, 1921.

German Trade.

It is reported from Leipzig that preparations for the new Fair are in full swing. The last Exhibition did much to revive business activity. The outlook is said to be improving and affords an indication of how far German industrial life has overcome the difficulties of the previous year. Doubtless the coal shortage is undiminished, and imposes a heavy burden on industry, curtailing production. Yet in spite of this handicap and the uncertainties of the future, it appears that new undertakings have been started, and they are apparently judiciously financed and ably directed. This is due not only to trade exhibitions, but to the advent of a new school of financiers who recognize that they must produce what the foreign markets want, and what other countries cannot do without. There are several ways of accomplishing this object, the chief of which are the manufacture of goods of better quality and the development of technical skill. It is believed with the progressive rehabilitation of industry their number will increase. Nevertheless there are still the uncertainties of the Government's schemes — the increasd railway freights and taxes and until traders are enlightened concerning the toll to be taken in these and other forms, it is premature to anticipate a great revival of interest in business. The prospects of the paper industry are generally regarded as favorable. The number of different grades of paper exhibited at Leipzig was notable, even among the 15,600 firms which displayed their goods.—Papier-Markt, February 10, 1921.

Politicians and Paper Makers in France.

In December free-traders and hack politicians set loose in the Chamber a tempest of gusty rhetoric. Less than fifteen days later the parliamentary wind had veered around to the opposite direction. In fact on December 16 ministers took an unexpected leap, and politicians afraid of a hand-full of ribbon-makers proceeded to ladle out protectionism of the go-as-you-please sort, like a nurse administering jam and rhubarb to a family of pimply children. (ce pele, ce galeux!)

As for paper, no one was willing to speak of duties. A law, which cuts blindly at the manufacturers of paper, was hustled through as a cure for uneconomic prices. It abolishes the duties on paper for the daily and periodical press and for books.

However, though matters have passed from conception to realization, the economic conditions of France are improving little by little. Coal, which is more plentiful, is notably lower in price, and the price of paper, intimately associated with that of coal, will fall off in turn. If the publishing industry follows this movement the dangerous position of the French press, French books, French thought, which was imputed to the paper makers, will be relegated to the stock of grotesque phrases in the politicians' *thesaurus*, because the public prepared for docile admiration and belief, can no longer be deceived.—Le Papier, January 1921.

The Strikers in Swedish Mills.

The strike in the cellulose mills, which commenced about a week ago, unfortunately threatens to spread to the whole paper industry. The mills in Sundsvall and in the Harnosan district have stopped, and also the mills at Edswalla, Skoghall and Frederiksberg. These mills have a yearly output of about 260,000 tons of sulphite and 85,000 tons of sulphate cellulose. Last week the diminution of output was 9,900 tons of sulphite and 280 tons of suphate a day. On Monday the workmen at Wallvik also struck, and there are rumors that the laborers in the Vermland mills are preparing to strike. —Affarsvarlden, February 16, 1921.

MADE IN CANADA.

For the year ending November, 1920, Canadians imported goods valued at $1,345,582,300 as against $920,082,927 for the previous year, an increase of purchases from other countries amounting to $425,499,373.

Of the total, $927,564,711 worth, or over 68 per cent, came from the United States. On those imports Canadians paid exchange reaching as high as 17¼ per cent (On December 21, 1920, exchange reached a record where the Canadian dollar was only worth 81⅞ cents in United States funds). Canadians are still sending their money to the United States and paying heavy exchange in spite of the fact that thousands of Canadian workers, who are able and willing to produce the most of these imports, are out of employment because Canadian factories are running part time or closing down because they lack orders for goods. The unemployed men and women and their families are being supported at the public expense, involving an additional burden to tax payers.

If Canadians united in a resolve to buy Canadian made goods, as far as possible, instead of imported goods, most of the problems of trade depression and unempoyment would be quickly solved. —. The Crest.

Transactions of the Technical Section

THE VENTILATION OF PAPER MAKING ROOMS.

By H. S. TAYLOR.

(Continuing the discussion of papers presented at the annual meeting of the Technical Section. The address was printed in this magazine on Feb. 17th.)

MR. TAYLOR concluded: There is nothing new about the system. You perhaps have one just like it in your mills. The point I wanted to make clear is that the principle is to remove all the moisture from the room, and not simply to prevent a high degree of condensation and drip, but not to leave the moisture within the room, to slowly deteriorate the enveloping structure.

MR. MASON: I would like to ask Mr. Taylor if he has worked out any method of efficiency for this method of ventilation? What efficiency do you think it is possible to obtain under operating conditions?

MR. TAYLOR: Mr. Mason, my answer is that there is a question of what we shall compare it with—with what other system?

MR. MASON: What I meant was, what heat units are provided—what proportion of them are actually used to take out the moisture? You must introduce more heat units than are actually required. If you put in one hundred units, how many of those heat units are actually working?

MR. TAYLOR: You can make figures. You can do a great deal of figuring on this system, but the question of figures is not always true. We figured out the heat units that would be introduced, and I have given that number as 2,400,000 for the conditions assumed. Now, that amount varies, of course, with the outside temperature; for a condition of twenty degrees below zero that number is required, but so far as I know they are working on an installation that is not one of absorption—excepting for a small amount—I would say probably fifteen per cent is absorption, and the balance is sweeping. In other words if you take a broom and sweep dirt or snow, there is only a small part of that snow actually touches the broom, it does not absorb very much, and the sweeping out of water vapor is like that; the number of heat units I have mentioned is what is required to keep the rough walls dry. If you put less than 2,400,000, you will find evidence of moisture. As an example of that, last winter I was in one of the mills and the room was dry; I went down and shut off the steam, and inside of fifteen minutes everything was wet and beginning to drip. Then we turned the steam on again and began to shut the air down, and the same condition took place, which showed that to prevent the wetting effect was taking a certain amount of air, irrespective of the heat, but shut the heat off and you got dampness right away.

MR. CASE: Did you make any tests to determine the moisture conditions? I take it the air is more than saturated. Part of it would be in the nature of supersaturation?

MR. TAYLOR: We have had tests made, but I have no figures here. The point you mention is one reason for the demand for hoods. In installations that we had a few years ago the hood was put up under the roof trusses, say seven feet over the top of the driers, but cold currents got across to that before the air could get under these hoods, causing fog, so we put the hoods close to the machines, and now the moisture condenses out of doors, where it should.

MR. BRASSINGTON: I would like to ask Mr. Taylor a question with respect to the temperature he has spoken of. I have had some experience under trying conditions, mostly along the Atlantic Coast, and the States where the saturation of the air in the first instance runs over sixty-five per cent. and we found that it paid us to put in a refrigeration plant and sprinkle the incoming air with cold water, and cause it to precipitate its own moisture, and at the same time remove the impurities, because air has a rapidly increasing voracity for moisture with rise of temperature, and I thought I would take this opportunity of asking whether you have any data covering the proper incoming temperature according to the different outside conditions of humidity.

MR. TAYLOR: I might answer that question in this way. We never attempted removing moisture from the air coming in. We thought of moisture in the air going out. The point is to have that air coming in as dry as possible, which we accomplish by heating rather than cooling.

MR. BRASSINGTON: My particular problem was dry powder, and we could not dry it unless we put in a little refrigerating plant back of the fans, so as to drop the air down to about 40 deg. F. and then it would precipitate its own moisture, so that the air going into the intake of the fans had that much less moisture in it.

It would be too expensive to operate, but I was wondering if in your practice you made any investigation as to the efficiency of your apparatus with respect to the humidity of the incoming air. Up here in Canada, where the air is very dry, that problem would not come up, but when you get down to the moist air near the tropics, it would be well worth knowing.

MR. TAYLOR: You speak about the moist air further south. You take it where you have a warm temperature, and you are not under the same conditions as you have in the north. It is the low outside temperature that gives you the greatest trouble.

THE CHAIRMAN: I observe from Mr. Taylor's remarks that he believes in cutting down the glass area in machine rooms. Is there any rule observed, Mr. Taylor? (and I want as much light on that as possible.)

MR. TAYLOR: We have no accurate figures on that as yet. We have a number of machine rooms, and we really use one window to the bay, and the size of that opening depends a great deal on the heat of your room. It has been the custom in some mills to put in a large area of steel sash, and we cut those down to one window where you have a large machine room. You do not get much light through to the center bay anyway. With a single window, say five lights wide, and of a height that will fit in between your crown beam and the proper height above the floor, will give you light enough. That is our idea of it. Some other operators would not do it. It is a question of the operator himself in most cases.

MR. WARDLE: I want to congratulate Mr. Taylor on the excellent paper. Some of you might be interested in a new ventilating system in connection with our new machine. It follows very closely Mr. Taylor's suggestion — very closely indeed, both as to quantity and as to general practice. We have the regular roof trusses, steel construction, and steel columns, about six feet centers, and on top of that we have concrete slabs, avoiding anything that can rot. On top of that we place

three inch. wide pine planks, culled planks, the cheapest we could buy, and with the regular tar and gravel roof on top of that. That may sound like an expensive roof, but it is not. It is a ridiculously small amount to pay for the insulation that you get. It gives very satisfactory results indeed, and as far as loss of heat goes, you can readily see the difference between that roof and the roofs of the other buildings, after even a light fall of snow. The snow stays on that roof and everything else is bone dry.

On the under side of this one I speak of, we used metal lath and plaster, thus giving us an air space of thirteen inches in height above the top of the truss. That extends the whole width of the room, and we introduce our air into that space, so we have the entire length under pressure, as Mr. Taylor has outlined is necessary.

The air is introduced into that room through little register openings, which are adjustable, through this plaster ceiling underneath the columns. These are according to our best judgment, particularly at the walls and the ends of the room, and all that air is made to pass directly toward the driers.

MR. TAYLOR: I might give one other little illustration on the question of circulation. You notice on the street a number of shop windows with fans in them — simply small, electric fans circulating the air, and you will see no frost on such a window. You probably will see frost on the next window, which has no fan. That is a question of circulation. There is no condensation on the window. It is being carried away.

MR. BRASSINGTON moved a vote of thanks to Mr. Taylor for his excellent paper. It was seconded by Mr. Mason and carried unanimously.

STRENGTH TESTING OF PULP.

By K. G. WILEN.

Mr. Wilen's paper was published in the Pulp and Paper Magazine for January 20th, 1921.

The discussion follows:

MR. BRASSINGTON: I got the notion that it was extremely important, from the paper maker's point of view, whether he used air-dried pulp or machine dried pulp — whether you would get a stronger paper if you used air-dried pulp than by machine dried pulp.

MR. WILEN: No, that impression is not quite correct. It has been found that pulp that has has never been dried at all produces a better paper than the others, and the difference between air-dried and machine-dried pulp is not very big. Drying in any shape or form weakens the pulp.

MR. HOVEY: I would like to ask if you did this work on beaten or unbeaten pulp?

MR. WILEN: We have determined the strength of the pulp unbeaten, and then beaten, for different lengths of time, and we have found there is no relation whatever between the strength of the unbeaten pulp and the strength of the pulp which can be developed by beating. As a matter of fact, there is no difference between the unbeaten sulphite and kraft pulp, when you beat them both for an hour, the sulphite will come up one hundred to one hundred and ten percent. and the kraft about one hundred and sixty percent. In regard to their unbeaten strength, the pulps are equally strong.

MR. BRYANT moved that the Section extent a vote of thanks to Mr. Wilen for this very interesting paper. MR. SLACK seconded the motion which was carried unanimously.

Financial Statement.

The financial statement was read as part of the Secretary-Treasurer's report.

MR. STEPHENSON: May I have the pleasure of moving the adoption of that report? In doing so, I would like to call attention to the fact that balance for the vocational and educational committee is pretty rosy, yet there is quite an amount standing against it in the way of obligations to authors who have turned in manuscripts. I think all of them received an initial payment on account, but there still remains a large portion to be paid on the completion of the manuscripts and the publication of the books. I want to say, especially that some men have not only agreed, out of their limited amount of time, to prepare a manuscript, but some of them have been so wonderfully generous as to offer to do that without expense to the Association, and our very hearty thanks are due them, and I so move.

The motion carried unanimously.

Chemical Standards

The report of the committee on Chemical Standards was read by title and adopted as printed in the Pulp and Paper Magazine for Jan. 20.

(To be continued.)

WHAT THE NATIONAL FORESTRY PROGRAM COMMITTEE HAS ACCOMPLISHED.

The "State Forest Policies" proposed in the report of Nov. 11 of the Committee on Forest Conservation of the American Paper and Pulp Association, are the basis for an active campaign for state legislation in Wisconsin.

The Union League Club of Chicago invited all the governors and forestry officials of eight states, Ohio, Indiana, Illinois, Missouri, Iowa, Michigan, Wisconsin, and Minnesota, to hold a conference at Chcago, Feb. 24, to formulate similar policies for all of these states.

These two statements show the momentum attained by the campaign for a national forest policy in which the American Paper and Pulp Association has been no inconsiderable factor.

It was realized last fall, that the campaign needed a definite organization with the special task of agitation for forestry legislation in Wisconsin in pushing agitation for forestry legislation, so the National Forestry Program Committee was formed with representatives of the paper, lumber and wood using industries, the American Newspaper Publishers Association, forestry associations, technical foresters and others are members. R. S. Kellogg, a member of this Association Committee, is chairman, and Warren B. Bullock, secretary.

The Snell bill has already been introduced in Congress, hearings held, and the campaign is progressing more rapidly than its most enthusiastic supporters had thought possible.

17 DEATHS, 26 FINGERS, 3 THUMBS.

That is the total number of serious accidents from 45 members of the Paper and Pulp Section of the National Safety Council for ten months of the year 1920.

"Mull" this over and when you go down through your plant today. Remember, if it is possible for an accident to happen at any place—an accident will happen there. Make your plant safe!

A New Canadian Enterprise

The Building of Paper Machinery by Port Arthur Shipbuilding Co., Limited.

Some will ask why this great shipbuilding company whose well deserved reputation as the builders of no less than forty-six sea-going vessels, many of which are on the seven seas, others on the great lakes, amongst them being the "W. Grant Morden," the largest of all on the great inland seas, should embark in the manufacture of paper machinery.

The answer is easily given. This large shipyard has expanded during the world war to dimensons that exceed in capacity the possible demands of the marine world during times of peace, for freighters that carry the products of our civilization to the ports of the world.



GENERAL VIEW OF PLANT.

Why paper machinery? Because, with the possible exception of the steel industry the pulp and paper trade is the greatest of all manufacturing enterprizes; Canada will be the greatest producer of pulp and paper of all the nations in the world and Port Arthur is the natural spearhead of this great shaft of industry in the Dominion. In or near Port Arthur should be located a reliable source of supply of the tools of the paper trade.

Outside of the mere facts which naturally govern the decision arrived at by a manufacturing concern considering the marketing of a new line of machines there is also something fine, something fascinating, something almost romantic in serving the paper trade.

The paper trade is one of the most ancient trades. Excellent writing paper was made by the Chinese from fibrous material having in its substance the fibre of the cotton plant reduced to pulp, according to Mr. Stanilaw Julien, as early as the year 152 B.C.

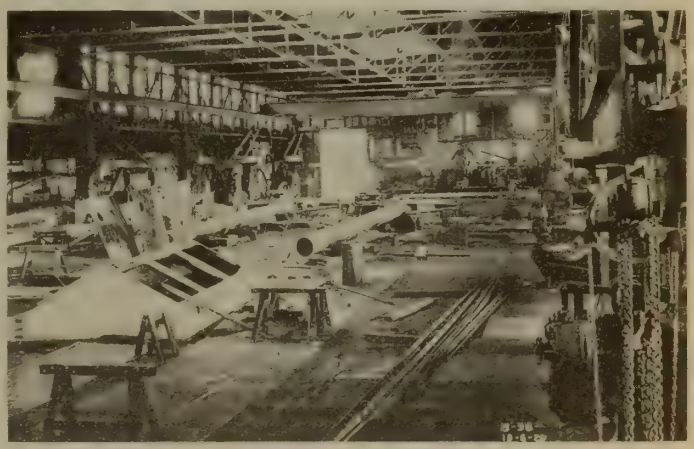
Paper is a necessity, if only for its service to the colossal self-conceit of the average human being. This conceit is partly due to our superiority over all the other animals on earth and partly because it is natural to us. It is evident that such a race would be exceedingly anxious that its achievements, experiences and observations, individually and collectively, should pass into record. It is to this very pride or self-conceit that we owe our present state of civilization; it is to this very pride or self-conceit that we owe our present state of civilization; it is to this quality, together with our industry that we owe our progress; it is above all, to this quality that we owe the art of paper making, and if that art were forgotten there could be no progression of human thought beyond a very circumscribed mental area.

No other material used in the arts has more manifold uses and possibilities. There seems to be nothing used by men that cannot be made of paper. It is the vehicle of our correspondence, both printed and written; it is used for:

Bags, wrapping paper, barrels, fruit baskets, pails, buckets, powder, kegs, carpets, mattings, car wheels, pulleys, collars, cuffs, curtains, sheets and panellings. observatory domes, furniture, picture frames, roofing felt, roofing tiles, racing shells and boats, twine, journal bearings, packings, belting, lead pencils, underclothes, clothes, blankets, towels.

They even make bricks, gas pipe, horseshoes and foot gear for men from this magic material.

Can anyone measure the value of an art that produces the material on which we record the thoughts of the great ones of our race? Who cares to talk with the present day great, whose claims have not yet received the endorsement of time? Who would hover round the door to catch a patronizing smile when the company of the greatest of all times is at our command because we have made paper and because our fathers and grandfathers for generations have made paper and printed books. We can, therefore, because we have paper, chose our company and invite to sit with us by our study fire the brightest and best of mankind. We can even insist that this selected company be in its very best humor and in its most entertaining and most instructive mood. Furthermore, we have the privilege of closing such interviews as soon and as curtly as we please, by quietly closing our book, with a grateful



ERECTING SHED .

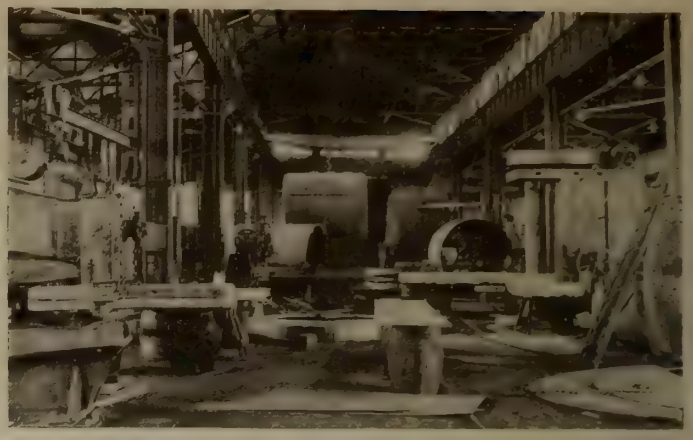
knowledge that no hurt can be felt by the great sensitive souls we ask to entertain us.

We may feel, as we pass a pleasant hour with each great mind, as though our visitor was saying: "This you are reading is the best of me; as for the rest, I ate and drank and slept; I loved and hated like any other; my life is now but vapor and sound; but this you read I saw and I knew and if there be anything of me worthy of your memory and your attention you have it now in your hand."

The fact that paper exists permits us to enter into this society of the great. All may enter; if we desire the companionship of the noble we have but to become noble ourselves; if we long for the conversation of the



FIRST FLOOR—JOINER SHOP.



BOILER SHOP, LOOKING NORTH.

wise we have but to learn to understand it. In these modern days we are making enough paper to enable anyone, be he ever so poor in this world's goods, to learn to qualify himself to enter into the company of the mighty dead.

The Port Arthur Shipbuilding Company has employed in its shops 1,400 hands, having a monthly payroll from $190,000 to $200,000. In that number there is such a fine aggregation of first-class mechanics that the group compares favorably with similar groups in any machine building plant in the world. The machines and the men behind them required to build marine reciprocating engines, are as capable of manufacturing paper machinery as they have proved themselves capable of producing these fine power units, which are a worthy sample of their past achievements.

The plant of the Port Arthur Shipbuilding Company is situated on a tract of 110 acres of ground inside the breakwater at Port Arthur, it has a water frontage of 3,030 feet with 1,250 feet of docks. The whole area is served throughout by traveling cranes and standard gauge railways.

The main office is a solid brick building, 42 feet x 66 feet, three stories high. There is a warehouse and storeroom of, solid brick, steel trussed, 60 feet x 100 foot; a power house, also built of solid brick, steel trussed, 50 feet x 108 feet.

The great erecting shed is a frame steel trussed building 403 feet x 150 feet, with ample capacity to accommodate two wide, high speed "News" machines for erecting purposes.

The foundry is built of solid brick, steel trussed and has a floor 90 feet x 160 feet. This building, like all the others, is built on the solid rock and in it is blasted out a pit of ample width and depth to permit the casting of a large "Yankee" dryer 14 feet in diameter and 150 inches in face, or in it can be cast two dryer cylinders simultaneously, 60 inches diameter by 250 inches face.

The joiner shop, in which has been built all the woodwork for many a fine yacht and freighter, lends itself to the erection and building of flow boxes, cylinder vats, wet machines, etc. This joiner shop is built of solid brick, is two stories high and has a total floor area of over 10,000 square feet.

The boiler shop is a building of solid brick, steel trussed, 90 feet wide and 260 feet long. It is fully equipped with overhead cranes, hydraulic riveters, hydraulic presses, punches, shears, planers, rolls, etc., and in it have been built many large Scotch boilers. This shop can handle easily the largest digesters required in the pulp business or build with accuracy the tanks, incinerators, etc., required by the pulp and paper trade.

The pipe shop, which has often furnished all the piping for large modern freighters, including the intricate copper work required, is fully equipped not only with respect to tools, but also with the skilled personnel necessary to finish the brass and copper work required on a modern paper machine. This pipe shop is built of solid brick, steel trussed, 50 feet in width by 100 feet long.

The blacksmith shop, supplied with power hammers, with its efficient equipment of men and machines, forms the hammered steel gudgeons and makes the forgings required on the paper machine.

The machine shop, which is also a solid brick structure with steel trusses, is 90 feet wide and 180 feet long, supplied with overhead cranes and a full complement of modern tools and skilful mechanics. It is this shop that has assembled and finished not only triple expansion reciprocating marine engines up to 2,000 Horse Power, but also the winches, windlasses and steering engines required on a modern freighter; its success in building steam shovels and other specialties has resulted in many repeat orders.

It is most interesting to see skilled mechanics take the component parts of a modern paper machine, prepare them and assemble the entire unit on the erecting floor so that every precaution is taken to insure the paper machine manufacturing paper right from the start without the necessity of "tuning up" when the machine is erected in the paper mill.

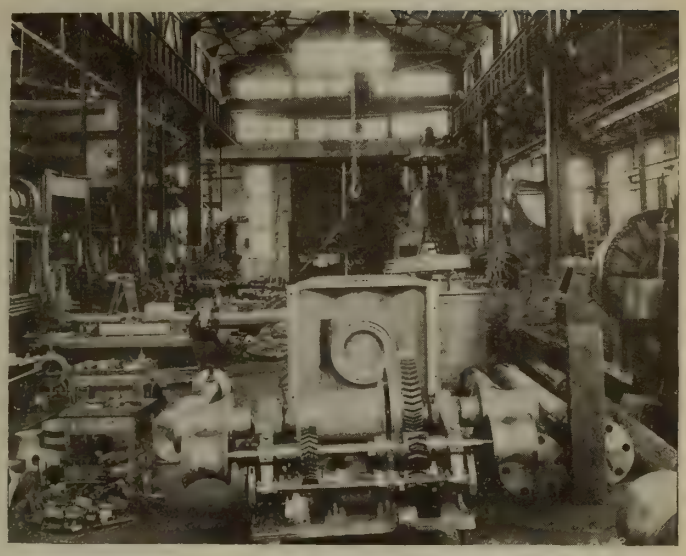
The pattern shop is built of solid concrete, is a two-story building 60 feet wide and 100 feet long, and in it pattern makers are busy making the numerous patterns required for the complete line of pulp and paper machinery, which the Port Arthur Shipbuilding Company offers to the Canadian pulp and paper mills. There are, in addition, the carpenter shop, paint shop, electric shop, air tool shop and other miscellaneous buildings, in all, twenty-seven.

The ground covered by buildings alone is 113,388 square feet, or 2.6 acres. The accompanying illustrations can only indicate the completeness of the equipment which the Port Arthur Shipbuilding Company is fortunate enough to possess, the existence of which is the primary reason for its entry into the field of manufacturing pulp and paper machinery.

It was not alone commercial advantage that caused this move, nor even was it solely because of the com-



NORTH WEST CORNER OF MACHINE SHOP.



MACHINE SHOP, LOOKING SOUTH.

mercial and sentimental reasons given in the beginning of this article. It was the feeling of responsibility on the part of the Port Arthur Shipbuilding Company that the hundreds of men in its employ, living in the neighborhood, should always have reason to feel secure of a means of earning a livelihood near their own homes; it is surely worth while to maintain such a splendid organization with its component units of worth while individuals; to take precautions that it should not disintegrate now that the great world war is over and the demand for ships has been reduced.

It is evident that this company could choose no better way of insuring not only its own future, but the future of its employees than by entering into the manufacture of the machines that are necessary to the great Canadian pulp and paper industry, which will undoubtedly be not only the greatest commercial enterprise in the Dominion, but very possibly, the greatest industry of its kind in the world.

In considering the advisability of building pulp and paper machinery, the Port Arthur Shipbuilding Company developed the fact that paper machine building is not as high a grade of the art of machine building as machine tool work, or reciprocating engine work, but really grades somewhere between these types and the rougher classes typified by agricultural machinery. The Port Arthur Shipbuilding Company concluded that there is no reason why any well appointed machine shop provided with the proper plans and specifications should not build as successful a paper machine as the oldest and best of those firms who have been engaged in paper machine building for generations. This conclusion has been confirmed by the success achieved by the Dominion Engineering Works in building the great news machines for the Laurentide Company. These machines are not only the first that the Dominion Engineering Works built, but in their manufacture they had the assistance of only one man familiar with the art of paper machine building. In this particular case old established precedents and methods of paper machine building were departed from and the result is that this machine probably represents the most advanced type of paper machine ever built being capable of a paper speed of at least 1,000 feet per minute and lending itself in its basic design to easy operation and facile change of clothing.

The necessity for a source of supply in Canada of paper makers' tools and the fact that Canadian pulp and paper mill owners would prefer to buy in Canada governed the wise decision to establish a pulp and paper machine building plant where it would form the necessary link in a complete industry. There is a national purpose in establishing a world leading trade in Canada, which appealed to the patriotism of the Port Arthur Shipbuilding Company.

The President of the Port Arthur Shipbuilding Company is Mr. James Whalen. There are few men who can boast the wide acquaintanceship that Mr. Whalen has in Canada and the United States. "Jim" Whalen, as he is universally called, is well known for his activities in the shipping and steel interests at Halifax and on the Atlantic Coast. His name is a familiar word in Montreal and Chicago, where he has financed the transactions that have given life to industries that are all through Canada from Halifax to the Pacific Coast, where the Whalen Pulp & Paper Mills are doing their share in swelling Canada's output.

The Secretary-Treasurer of the Port Arthur Shipbuilding Company is Mr. A. B. Conmee. Canadians will remember "Jim" Conmee, the famous northern Member of Parliament, whose foresight and broadness of vision gave birth to many plans for developing the Dominion; many of these plans are now being carried out by those who recognize the opportunity this country possesses to take her place as the leading world manufacturer of products made from her inexhaustible supply of raw material. Mr. A. B. Conmee follows in his father's footsteps in taking an active part in an undertaking based on the national use of the products of Canada's forests.

The Port Arthur Shipbuilding Company in its manufacture of pulp and paper machinery has acquired the services, as Chief Engineer, of Mr. John W. Brassington, whose long service in charge of design with the Pusey & Jones Company and whose practical experience as Chief Engineer and Manager of Manufacturing for the American Writing Paper Company of Holyoke, Massachusetts, qualify him to assist ably in the devel-



MR. JAMES WHALEN,
Presiden, Port Arthur Shipbuilding Company, Limited.



MA. A. B. CONMEE.
Secretary-Treasurer.



JOHN W. BRASSINGTON.
Chief Engineer, Pulp and Paper Machinery Manufacturing Dept.

opment of their pulp and paper machinery building department. Mr. Brassington is an Engineer, trained in England and has the advantage of many years active engineering practice in the United States.

Let us wish all success to this new Canadian enterprise, it gives Canadian Pulp and Paper Mill owners another source of supply in the Dominion and we believe this kind of initiative and ambition deserves not only success, but support by all those that desire prosperity here at home.

WALL BOARD FROM INFUSORIAL EARTH.

Mr. Ivan A. Bayley, of North Sydney, Nova Scotia, writes as follows: "After experimenting for some time on the utilization of tripolite or infusorial earth, I have succeeded in producing samples of a remarkably efficient wall board. The tripolite besides containing the necessary bonding material is mixed with considerable quantities of sawdust which has the effect of adding pliability to the sheets and rendering them more open so that nails may be driven quite near the edge without danger of splitting or spoiling the sheets and makes sawing easy. These sheets are remarkably light in weight and are fireproof and owing to the well known insulating properties of tripolite are great non-conductors of heat, cold or sound and are very strong. These sheets can be made into any convenient size and owing to the great strength of the binder used may be made as thin as one-quarter inch in thickness. As very large beds of tripolite or infusorial earth occur in Nova Scotia, Newfoundland and elsewhere in shallow lake bottoms and marshes, it thus becomes only necessary to drain off these areas and expose the beds to the natural summer drying when the tripolite can be piled in sheds and used as wanted. As both tripolite and sawdust are very cheap materials and the bond used being also very cheap, this process certainly seems to place a very valuable asset at the disposal of home builders. Further experiments are now under way with the object of producing sheets suitable for exterior work and roofing."

CATALOGS RECEIVED.

An important index of progress in any industry is available in the catalogs of companies manufacturing the machinery and developing the processes employed. New ideas and improved equipment are essential to progress and the firms who serve the pulp and paper industry are among the most progressive. The Pulp and Paper Magazine appreciates the receipt of new catalogs. Among those recently received are the following, which, of course, are available on request to anyone interested.

Jeffrey Standardized Scraper Conveyors is the title of catalog No. 257 of the Jeffrey Mfg. Co. Columbus, Ohio. It shows scraper conveyors handling pulpwood, straw, wood refuse, coal, ashes, etc. horizontally and at inclines up to 45°. Data for calculating sizes and capacities are given.

L. E. Knott Apparatus Co., Boston, Mass., have issued a catalog, 24-c, on laboratory equipment and supplies for Chemistry and Biology.

Noble & Wood Machine Co., Hoosick Falls, N.Y., have developed a paper pulping engine which is described in their catalog No. 76. Regular sizes are: 700, 1,000, 1,200, 1,500 and 2,000-lb. Cylinder washers, continuous beater attachments, etc. may be used.

Mason Regulator & Engineering Co., 145 Wellington St. W., Toronto, have sent out a condensed catalog of valves, regulators, traps, meters, gauges, pumps, etc.

It is a bit late to acknowledge the fine calendars of **Waterous Engine Works** and **National Aniline and Chemical Co.**, but they are very much appreciated.

PULP AND PAPER NEWS

At the annual dinner of the Foresters' Club of the University of Toronto the chief feature was an address by Edward Beck, of the Canadian Pulp and Paper Association, Montreal, on "What the Pulp and Paper Industry Means to Ontario" in which something of Ontario's pulpwood resources, their consumption and the means that were being taken to replenish the stocks were outlined by Mr. Beck, who also uttered a warning against the practice of exporting unmanufac tured logs. The United States was confronted with the necessity of stopping the practise and Canada would have to follow in their footsteps. "We are just as tardy as they have been in coming to a realization of the limitations of our forest wealth, and to a knowledge that we cannot continue indefinitely slaughtering and wasting our forests without an intelligent effort at renewal and replacement unless we want to encounter ruin," said Mr. Beck.

Reporting to his Toronto office, P. P. Cowans, of McDougall & Cowans, Montreal, states that the Spanish River Company have got all the pulp they need. Last October they were short of water for a time, and had to go into the market to buy some pulp to supply their demands, but the thaw came and gave them all the water they required. According to Mr. Cowans the company is making more money today than any other company in Canada. It is one of the few companies that have not split up their shares.

The Shackleton Pulp and Lumber Company, Limited, has been granted an Ontario charter with power to engage in a general lumbering and pulpwood business and head office at Toronto. The company is capitalized at $50,000 and the provisional directors are A. L. Moffat, W. L. Bland, C. S. Middleton, J. J. Cooper and S. N. Schatz.

Capt. W. H. Maxwell, of Hamilton, Ont. has been engaged as First Pilot for the Laurentide Company Air Squadron at Grandmere, Que. and will assume his new duties in a short time. He takes the place of Lieut. Stuart Graham, who resigned the first of the year and accepted a position with Price Brothers.

An extra one per cent was declared on Provincial Paper stock in Toronto last week, along with the regular one and a half per cent. The extra is considered as a continuation of the policy of last year, when the distribution for the twelve months was 6, plus 2. The dividend on Provincial Paper common was increased from 4 to 6 per cent in October, 1919.

The T. S. Woolings Company, Limited, Englehart, are erecting a pulpwood rossing plant at Connaught. Ont. The plant will have a capacity of about forty cords per hour. The engineering firm of Sutcliffe & Neelands of New Liskeard. Ont. are doing the engineering work and will be in charge of construction. The plant will be equipped with an American barking drum.

The Toronto office of the Canadian Barking Drum Company report having sold one of their drums to the Three Rivers plant of the Three Rivers Pulp and Paper Company, Limited.

Among the officials of the Spanish River Pulp and Paper Mills, Limited, in Toronto last week for the meeting of shareholders in connection with the recent bond issue were: George H. Mead, president: P. B. Wilson, president of the Canadian Pulp and Paper Association: R. T. Houk, general sales manager of the George H. Mead Company, Dayton: Col. Jones, managing director of the Spanish River Company and assistant General Manager Irvine.

Sales Manager Bryant of the Brompton Pulp and Paper Company, Limited, was a business visitor to Toronto last week.

A. Huntley, of the Toronto office of the Hodge, Sheriff Company, selling agents for the Wayagamack Paper Company, spent last week at the Wayagamack mill.

Arthur Hobson, who has been connected with the Toronto office of the Howard Smith Company for some time, has gone to Winnipeg as western representative of the company. Mr. Hobson, who was formerly with the Toronto Paper Company, is an overseas service man and has been popular in the paper trade in Toronto.

An excellent exposition of the forestry problems of Canada was given by Robson Black, secretary of the Canadian Forestry Association, at a meeting of the Empire Club at the King Edward Hotel, Toronto, last week, who declared that before the term "forest conservation" could become much more than an amiable password we must elevate the forest resources into the very front rank of public policies and take on the job associated with their management as a first concern in our national economy.

PULP EXPORTS FROM CAMPBELLTON DISTRICT.

Mr. G. C. Woodward, American Consul at Campbellton, N.B., has kindly sent the following report to the Pulp and Paper Magazine.

Exports of Wood and Products in the United States from Campbellton, New Brunswick, Consular District.

Article.	Qty.	Quantities.	Values.	Quantities.	Values.
Wood & Products:		1919.		1920.	
Lath	M	134,142	401,842	36,137	320,425
Lumber	M	92,929	1,447,857	48,384	1,940,726
Miscellaneous	—	8,715	5,585	.....	.....
Pulp	Tons	26,560	2,073,769	35,889	4,270,537
Pulpwood	Cds.	26,333	366,235	39,972	777,831
Shingles	M	111,404	468,327	49,572	314,647
Ties	Pcs.	175,498	74,723	141,183	137,655
Total Wood and Products.			$4,939,338		$7,761,821

(Note)—Campbellton Consular District comprises the counties of Restigouche and Gloucester, New Brunswick and Bonaventure and Gaspe, Quebec.

Handing jumbo rolls may cause strained backs and dislocated limbs. If the roll is big do not attempt to lift it alone. You can always get help.

Technical Section

CANADIAN PATENTS RELATING TO PULP AND PAPER MAKING.

B-0. Wood preservative. Can. patent No. 198,670, J. A. DECEW, Montreal, March 30, 1920. Claims allowed 5. Same as U. S. patent No. 1,283,104. See Pulp & Paper, **18**, 527, Q-0, May 13, 1920.—A.P.-C.

B-0. Wood preservation. Can. patent No. 198,671, J. A. DECEW, Montreal, March 30, 1920. Claims allowed 3. Same as U. S. patent No. 1,283,105.—A.P.-C.

B-0. Preparation of wood for preservation. Can. patent No. 198,627, JOS. A. CODERRE and WM. G. KYNOCH, Montreal, March 30, 1920. Incisions are made by pushing the fibers of the wood aside to form relatively long slits, each slit having its max. depth in the center thereof, which gradually decreases towards the opp. ends of the slits, and the slits all being of the same depth. Claims allowed 6—A.P.-C.

B-4. Oleo-resin collection. Can. patent No. 197,704, S. E. OLIVER, B.C., Canada, March 2, 1920. A means of obtaining oleo-resin from growing trees which consists in boring a relatively small auger hole into the trunk of the tree at a slight upward incline from the horizontal, and means for directly connecting a suitable container to the lower end of the auger hole an air-tight connection. Claims allowed 5.—A.P.-C.

B-5. Log loader and decker. Can. patent No. 198,038, WM. L. SMITH, Ontonagon, Mich., U.S.A., March 9, 1920. Claims allowed 5. A.P.-C.

B-5. Tree felling apparatus. Can. patent No. 198,719, A. O. M. LEFGREN, Stockholm, Sweden, March 30, 1920. Claims allowed 5.—A.P.-C.

B-5. Timber tongs. Can. patent No. 198,869, JAS. J. VERRETTE and ALEX. WHITE, Odanah, Wis., U.S.A., April 6, 1920. Tongs embodying a curved yoke having a central angular aperture, jaws pivoted to the ends of the yoke and having portions extending at an angle within the yoke, a stem of angular cross section sliding through said aperture and having a head within the yoke curved to fit the yoke, said head having a slot and transverse pins extending through the slot, and said portions of the jaws extending within said slot and having slots engaging said pins. Claim allowed 1.—A.P.-C.

C-6. Sawing carriage. Can. patent No. 198,702, P. J. HILL, Chatham, N.Y., U.S.A., March 30, 1920. Claims allowed 7.—A.P.-C.

C-7 Barking machine. Can. patent No. 198,701, G. HELSTROM, London, England, March 30, 1920. Claims allowed 12.—A.P.C.

C.-7. Decorticating machine. Can. patent No. 197,872, R. S. MADDOCK, Swampscott, H. L. BROWN, Haverhill, and C. G. SHERMAN, Worcester, Mass., U.S.A., Mar. 9, 1920. The machine consists essentially of a rotable drum having a relatively resilient or fielding surface, rollers positioned to impinge against this surface, spring means whereby the rollers may be yieldably held in impingement against the drum so that the material being treated may be subjected to predetermined press., and pneumatic means for removing waste matter. Claims allowed 13.—A.P.-C.

C-7. Barking drum. Can. patent No. 198,571, International Paper Co., Assignee of E. HUTCHINS, New York City, N.Y., U.S.A., March 23, 1920. Claims allowed 20.—A.P.C.

C-7. Barking drum. Can. patent No. 198,572, International Paper Co., Assignee of A. H. WHITE, Brooklyn, N.Y., U.S.A., March 23, 1920. The patent covers a device for continuously feeding the wood to be barked into the receiving end of the drum, and means for maintaining in the drum a substantial level of water and flowing the same continuously through the drum from its receiving to its discharge end to cause the wood to be continuously discharged from the discharge end of the drum. Claim allowed 1.—A.P.-C.

D.-4. Automatic grinder stone dresser. Can. patent No. 198,748, F. E. RILEY, Livermore Falls, Me., U.S.A., March 30, 1920. Claims allowed 14.—A.P.-C.

D-0. Apparatus for producing fiber plants. Can. patent No. 198,754, GEO. WM. SCHLICHTEN, San. Diego, Cal., U.S.A., March 30, 1920. An appa. for crushing, denting, splitting, spreading, breaking, and finally cleaning, combing, and degumming the fiber bearing material. Claims allowed 6.—A.P.-C.

E-2; F-2. Method of refining raw woodpulp liquor. Can. patent No. 202,602, PAUL HEIN, Essen, Ruttenscheid, Germany, Aug. 3, 1920. A method of refining raw woodpulp liquor by means of fuel ashes. Claim allowed 1. Same as U.S. patent No. 1,344,691. Paper, 19, Sept. 1, 1920.—A.P.-C.

E-2. Reduction of sulfite waste liquors. Can. patent No. 202,947, V. DREWSEN, New York City, Aug. 17, 1920. Claims allowed 11. Same as U.S. patent No. 1,298,477, Chimie & Industrie, **4**, 233, (Aug. 1920).—A.P.-C.

E-5. Production of sulfite pulp. Can. patent No. 203, 184, C. BACHE-WIIG, Portland, Me., U.S.A., Aug. 24, 1920. The method consists in cooking small pieces of wood in a $CaH_2(SO_3)_2$ liquor and in injecting a very small quantity, say less than 5% of NaCl during the cooking operation. Claims allowed 3.—A.P.-C.

F-2. Reduction of waste liquors from soda pulp processes. Can. patent No. 202,945, V. DREWSEN, New York City, Aug. 17, 1920. Claims allowed 17. Same as Fr. patent No. 495,047. See Chimie & Industrie, **3**, 654, (May, 1920).—A.P.-C.

F-2. Causticized ligneous acetate material from waste pulp liquors. Can. patent No. 202,946, V. DREWSEN, New York City, Aug. 17, 1920. The process of treating the waste liquor produced in the manuf. of woodpulp to form therefrom acetate material adapted for the production of acetone and other allied volatile solvent material by dry distg. with steam which comprises concg. the waste liquor and incorporating and combining therewith additional NaOH to the extent of more than 20% of the org. matter present to produce concd. causticized material, and incorporating and combining therewith CaO and eliminating water therefrom to produce substantially dry calcareous ligneous acetate material which is permanently solid under dry distg. conditions. Claims allowed 25.—A.P.-C.

G-5. Slime pulp thickener and density indicator. Can. patent No. 198,157, CHAS. ALLEN, El Paso, Texas,

U.S.A., March 16, 1920. The thickener consists of a settling tank having a valve controlled orifice for the discharge of thickened material, a valve operating member within the tank in the region where the thickened material accumulates which is of such a wt. and shape as to sink in unthickened material and retain the valve closed and to rise in thickness material of the desired density to open the valve and allow the thickened material to be discharged. The wt. or resistance of upward movement of the valve operating member can be varied so as to vary the density of the discharged material. An indicator is operatively connected to the control means of the valve to indicate the density of the discharged material and so that discharge will occur only when a pre-determined density is reached. Claims allowed 11.—A.P.-C.

H-4. Electrolytic caustic soda cell. Can. patent No. 198,568, Industrial Chemical Co., New York City, Assignee of N. STATHAM, Hastings-on-Hudson, N.Y., U.S.A., March 23, 1920. Claims allowed 24.

K-11. Paper screen. Can. patent No. 203,120, Sherbrooke Machinery Co. Ltd., Sherbrooke, P.Q., Assignee of ANTON J. HAUG, Nashua, N.H., U.S.A., Aug. 17, 1920. As a new article of manuf., a segmental section for a cylindrical screen frame having a plurality of longitudinal supporting arc-shaped ribs of equal length, but circumferentially offset. Claims allowed 17.—A.P.-C.

K-11. Electrical dryer for paper. Can. patent No. 198,642, WM. CHAS. BALDWIN, Ottawa, March 30, 1920. The paper is dried between a pair of endless belts adapted to contact with opp. sides of the paper and electrically heated. Claims allowed 2.—A.P.-C.

K-11. Suction box for paper machine. Can. patent No. 198,391, JAS. E. McLAUGHLIN and J. O. HAMEL, Grand' Mere, Que., March 23, 1920. Claims allowed 8.—A.P.-C.

K-12. Papermaking machine. Can. patent No. 202,881, CHAS. E. POPE, Springfield, Mass., U.S.A., Aug. 10, 1920. In a paper-making machine, the combination with the paper-making wire, and the suction-boxes, of an endless wire-protecting felt interposed between the suction boxes and wire, means to support and drive the felt at the same speed as the wire, and means to clear the felt of paper fibers comprising means to direct a stream of water through the felt during its return traverse and a suction box cooperating with said directing means to remove the water from the felt previous to its outward traverse. Claims allowed 18.—A.P.-C.

K-14. Spacing device for roll paper cutters. Can. patent No. 198,657, B. CARLISLE, Santa Anna, Cal., U.S.A., March 30, 1920. Claim allowed 1.—A.P.-C.

K-14. Guard for calender machines. Can. patent No. 202,584, MIKE TELESZKY, Jenners, Pa. U.S.A., Aug. 3, 1920. Claims allowed 2.—A.P.-C.

K-18. Composite board. Can. patent No. 198,812, Cedaroid Co. Inc. Assignee of P. J. NAGLE, Rochester, N.Y., U.S.A., March 30, 1920. A board formed of a plurality of sheets each separately satd. with a compd. containing cedar oil, sugar and licorice, and united by an adhesive contg. cedar oil, sugar and licorice. Claims allowed 2.—A.P.-C.

K-18. Process of impregnating or saturating strawboard. Can. patent No. 197,589, A. E. SHIRLOW, Assignee to J. C. GATES, Melbourne, Victoria, Australia, Feb. 24, 1920. The articles are immersed for 30 sec. in a wax soln. at 190-210°F. Claims allowed 3.—A.P.-C.

K-18. Apparatus for automatically impregnating and saturating strawboard. Can. patent No. 197,590. A. E. SHIRLOW, Assignor to J. C. GATES, Melbourne, Victoria, Australia, Feb. 24, 1920. App. for impregnating strawboard containers according to Can. patent No. 197,589. Claims allowed 7.—A.P.-C.

K-0. Process of and means for neutralizing electric charges on fibrous materials. Can. patent No. 202,864, The Siemen and Halske, A. G., Assignee of PAUL RASEBURN, Halensee, and GUSTAV GROSSMANN, Charlottenburg, Germany, Aug. 10, 1920. In combination with a machine for working fibrous material, a source of ionizing rays for neutralizing the elec. charges of fibrous material when passing through said machine, and a grounded electrode for collecting the elec. charges from said fibrous material, the source of rays being applied to the electrode in the form of a coating and placed between the fibrous material and the electrode, which latter surrounds the fibrous material. The source of rays consists of a coating of radioactive substances. Claims allowed 4.—A.P.-C.

M.-9. Conveyor for pulp articles. Can. patent No. 196,938, The Keyes Fiber Co., Waterville, Me., Assignee of F. W. WATERMAN, West Philadelphia, Pa., Feb. 3, 1920. Claims allowed 7.—A.P.-C.

M-O. Instrument for indicating and recording the flow of liquids. Can. patent No. 196,617, J. J. LASSEN, London, W. C., and J. L. GILBERT, Kew, Middlesex, Jan. 27, 1920. Claims allowed 5.—A.P.-C.

K-18. Fireproof fiber board. Can. patent No. 203,803, BROR G. DAHLBERG, St. Paul, Minn., Assignee of T. B. MUNROE, Forest Glen, Maryland, U.S.A., Sept. 7, 1920. The herein described new art. of manuf. consisting of a body of fibrous material impregnated with a complex compd. of ZnO and NH_3 associated with another fire-resisting compd. formed from the reaction between NH_4OH and a neutralizing agent. Claims allowed 5.—A.P.-C.

K-18. Plaster board of fibrous material. Can. patent No. 204,796, B. G. DAHLBERG, St. Paul, Minn., assignee of T. B. MUNROE, Forest Glen, Maryland, U.S.A., Oct. 12, 1920. In a plaster board, a body portion comprising silver-like fibers to give porosity thereto, long hair-like fibers to act as binder, and very short fibers to act as a filler, said body portion provided with undercut recesses in its surface adapted to hold plaster, and with a coating of water-proof material on its outer surface and in said recesses, which does not penetrate the porous fibrous mass to a substantial extent said body portion being further provided with a layer of plastic material overlying the waterproof coating and entering the recesses. Claims allowed 2.—A.P.C.

K-23. Reinforced paper. Can. patent No. 203,806, EDWARD H. ANGLER, Framingham, Assignee of LAWRENCE G. MILLER, Cambridge, Mass., U.S.A., Sept. 7, 1920. A method of prepg. transversely reinforced paper which comprises the following steps: coating a sheet with adhesive, inserting reinforcing strands in the adhesive coating, superposing a second sheet on the adhesive with edges offset from those of the first sheet and uniting lengths of the laminated material so made by securing together marginal portions provided by the offset edges in a splice joint whereby to provide a web of uniform thickness. Claims allowed 11.—A.P.-C.

Canadian paper equals any imported product and can be bought for less money.

UNITED STATES NOTES

Sixty men in the sulphite department of the Great Northern Paper Company, Madison, Maine, have been laid off indefinitely. More were laid off last week, but part of the force that has been dropped was employed in departments outside the sulphite division. No reductions have been necessary thus far in the paper making and ground wood sections.

The contemplated wage cuts in the plants of the American Writing Paper Company, mention of which was made in last week's Pulp and Paper Magazine, were put in effect last Monday. The reduction finally decided upon amount to between 10 and 18 per cent. Several thousand employees in the Holyoke mills are affected.

The National Pulpwood Corporation of Rutland, Vt., has filed articles of incorporation with the Secretary of State at Rutland. The new company's capitalization is put at $200,000, divided into 2,000 shares. The persons named as incorporators are: Perley R. Eaton, Grace J. Eaton and Mary V. Quigley, all of Rutland, and Edward P. Cleary, of Sillery, Province of Quebec.

A "forest of States" has been planned for Exposition Park, Los Angeles, Cal., by the Los Angeles Chamber of Commerce. It is hoped to obtain from every State in the Union, as well as from Hawaii, Porto Rico, Guam, the Philippines and Alaska a tree representative of the district from which it comes. These trees will be planted and cared for by the Los Angeles Municipal Park Commission. The Governor of each State is to be asked to send a tree typical of his State. Idaho and Louisiana have already responded, the former having sent a white pine, and the latter a magnolia.

The New England Paper and Pulp Traffic Association has taken a firm stand against the proposed adjustment of rates on "all rail" coal from the mines to points in New England. In a protest voiced through C. H. Tiffany, traffic manager of the organization, the revised charges are termed "incomplete, inopportune, unscientific and unsatisfactory." Mr. Tiffany contends that the industries on the Maine Central Railroad will be hurt if the proposed advance in rates is imposed and that their application will result also in a loss of business to the Boston and Maine R.R., if not to the New Haven and the Boston and Albany lines. It is claimed by the New England paper men that the rates, which they assert have been on a wrong basis since 1913, are at the uttermost peak right now and that any further advance would be extortionate. The New England Pulp and Paper Traffic Association represents thirty pulp and paper concerns, operating fifty large mills and other plants, using more than 1,000,000 tons of steam coal annually. Other New England business men, official representatives of the municipal governments of several cities, chambers of commerce and other organizations have joined the paper men in their opposition.

The Crown Willamette Paper Company, Portland, Ore., lost the services on March 1 of B. T. McBain, one of the pioneer workers in the paper field on the Pacific Coast. Mr. McBain, who was mill manager of the company's Oregon City mills and whose connection with newsprint and wrapping paper manufacture on the Coast dates back to 1893, will devote himself in future to the banking business. He intends organizing a banking house, among the stockholders of which will be many of his old associates in the mills, and he expects not only to handle part of the business of his old employers, but to be the banker for a majority of the Crown Willamette employees as well.

A fire, the origin of which remains a mystery, last week gutted the storage plant and office building of the Judd Paper Company in Holyoke, Mass. The damage is estimated at upwards of $150,000. John K. Judd, president of the concern, despite the serious setback, has let it be known that the slogan of the firm is "business as usual" and to that end the company officials have leased quarters in the American Braiding Company building and have sent out announcements stating that orders will be filled as usual, subject to slight delay.

Fruit growers in Michigan and adjacent horticultural States who have been finding it increasingly difficult to obtain adequate supplies of berry boxes and peach, pear and plum boxes, may find a solution of their problem in the plan of the Eddy Paper Company, Kalamazoo, by which it is proposed to use paper board in place of wood fibre in the manufacture of these containers. According to an announcement of Charles E. Nelson, general manager and secretary of the Eddy company, experiments along this line have been so entirely successful that the concern has completed necessary preparations soon to begin making all types of fruit containers, ranging from the ordinary quart berry box to a half-bushel measure, suitable for peaches, pears, plums, etc. The larger board measures will be equipped with handles, quite as easy and convenient to handle as the ordinary market basket. "It will not be until well into April, possibly May, before we are able to begin in the manufacture of fruit packages on an extensive scale," says Mr. Nelson's statement. "We are now running three shifts a day to fill the orders for our shipping containers and we must keep up with our orders in that line. The prospects are that the new fruit package department will require at the outset the entire product of a board machine and will increase the number of employees on our payroll from 400 to 600." The establishment of the new department will make it necessary to install a considerable amount of specially designed and built machinery and equipment.

The Black River Paper and Manufacturing Company, Waterton, N.Y. which a year ago was merged with the C. A. Mack Paper Company, has just acquired through purchase the M. M. Bagg Paper and Supply Company, also of Waterton. This means that another combine will be effected in the near future, making the Black River Company the largest wholesale paper mill supply concern in Northern New York. Allen Perkins will be in charge of the reorganized company.

Farmers burned up 68,244,000 cords of wood valued at $345,866,000, for fuel last year. Department of Agricultural figures disclose the average was 10.6 cords per farm.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, March 12.—While the mills are not by any means running at full capacity, it can be stated that some lines of paper show a distinct improvement in respect to turn-over and jobbers of light weight papers, particularly, have been cheered by a marked improvement in trade during the past week or ten days. Considerably larger sales of tissues and toilets are being made at the present time and the outlook has brightened considerably. This condition, however, does not exist in the same degree in finer papers and, despite price reductions this week in books, bonds and ledgers, no large volume of business is being transacted. It has been noticeable that falling prices have had little effect in stimulating business and it was hardly expected that they would. The downward revision of price lists in various lines of paper are not being made in the expectation that they will increase sales, but it has become necessary, in view of conditions across the line where lessened demand is causing paper manufacturers and jobbers to look to Canada for a market, although no great amount of paper has been shipped into the country as yet and serious competition is not anticipated.

BOOKS, BONDS AND LEDGERS.—Further recessions in these lines went into effect this week, the reductions averaging ten per cent. The jobbers' price for No. 1 S. C. book is now 19½c. in small lots; No. 2, 18c and No. 3, 16½c. M. F. book is 16c and bonds are from 21c a pound up according to grade. Most dealers and manufacturers would like to say that these prices are on rock bottom but such is the condition of the trade that no one knows what further recessions might take place. It is generally believed that prices will go still lower before the trade becomes stabilized. Mills are none too busy on the finer papers and the jobbers are finding it a difficult matter to reduce their stocks. In some cases the loss through the falling market and the receipt of belated orders from the mills will be considerable. In fact practically all the jobbers stand to lose considerable money through the turn the paper market has taken but they are accepting the situation philosophically for the most part and are hoping for a come-back of the market to something of its old status.

WRAPPING PAPERS.—The recent drop in the prices of wrapping papers did not have the effect of stimulating business and trade is still extremely dull. There has been no increase either in sales or enquiries and what business is coming through is of small dimensions. If it does not increase sales, the reduction in wrapping papers is likely to shut off United States competition which was one of the objects of the cut. Stocks are still rather heavy in the warehouses and jobbers are conservative in buying from the mills.

GLASSINE AND GREASEPROOF.—Trade in these lines has been extremely dull during the past week with very few transactions. While there has been practically no buying from American firms, many tempting quotations have been received from across the lines, but the buying era has not yet set in and what business there is going is domestic and small in bulk. That stocks of consumers are low is indicated by the fact that buyers' orders are very small and most of the buyers want the goods quickly. Glassine is quoted at 25c for bleached and 22c for unbleached while greaseproof is selling at 20c a pound for bleached and 18c for unbleached.

PULP.—The pulp situation remains unchanged with the mills running light and the transactions few and far between. Very few sales are being made and what deals that are being put through are at prices that do not represent any stable market price. As a matter of fact there is no market price for either chemical or mechanical pulp and sales are made on the basis of what the commodity will bring, in the absence of any real market.

TISSUES AND TOILETS.—Manufacturers in these lines report some improvement in trade. More orders are coming in and they are larger in bulk. Not only is this the case but orders that have been a little late in being delivered have been increased in size from the original and the general indication is that the jobbers and consumers are getting into a position where they can use more light weight papers than heretofore since the slump set in. Manufacturers are cheered at the prospect and report that the trade is gradually coming back. Prices have been unchanged since the recent reductions.

RAG AND PAPER STOCKS.—The entire lack of consuming demand for new cotton cuttings has finally ended in a general and rather steep down trend. There are few dealers who are willing to purchase when paper manufacturers are running at reduced schedule, or else closed down, unless they can get the stock at low enough figures to ensure against the present falling market.

There being no resumption or increase of operations at mills using old rags., this condition makes it as near a standstill as can be. The result is that as far as quotations are concerned it is almost impossible to get definite figures as the amount of business going on between dealers has been very low. The very slight call for waste paper during the past two weeks has created a situation which is a very severe one both for paper mills and waste paper dealers. Dealers report very few orders on hand, and mills advise that they have very little business on their books for delivery in the immediate future. The mills seem to be waiting for improvement in the demand for their products, and refuse to show interest in purchasing raw material until the demand improves. Most grades have slumped off badly since last report and quotations given are very nominal.

	Per Cwt. F.O.B. Toronto.
No. shirt cuttings	$11.00— $12.00
No. 1 unbleached cotton cuttings	7.50— 8.00
No. 1 fancy shirt cuttings	7.00— 7.50
No. 1 blue overall cuttings	7.00— 7.50
Bleached shoe clip	9.00— 9.50
White cotton hosiery cuttings	12.00— 12.50
Light colored hosiery cuttings	10.50— 11.00
New light flannellette cuttings	8.50— 9.00
No. 2 white shirt cuttings	6.50— 7.00
City thirds and blues (repacked)	1.40— 1.60
Flocks and satinettes	.75— .85
Tailor rags	.60— .70
Gunny bagging	.90— 1.00
Manila rope	3.00— 3.25
No. 1 white envelope cuttings	4.00— 4.25

No. 1 soft white shavings	3.75—	4.00
White blanks	1.75—	2.00
Heavy ledger stock	3.00—	3.25
No. 1 magazine	1.65—	1.85
No. 1 book stock	1.25—	1.45
No. 1 manila cuttings	1.75—	2.00
No. 1 print manila	.75—	.85
Folded news	.70—	.80
Over issue, news	1.00—	1.15
Kraft	1.75—	2.00
No. clean and mixed papers	.40—	.50

NEW YORK MARKETS.

New York, March 12.—(Special Correspondence).—No appreciable improvement can be reported in the paper market. Here and there reports tell of a little livelier demand for some grade of paper, but on the whole the market continues in a dull condition with the aggregate movement of supplies into consuming channels far below the volume that it ordinarily is. Buyers are still operating in hand-to-mouth fashion, limiting orders to paper directly required, and flatly refusing to anticipate future wants. Moreover, the average consumer is not using as much paper today as ordinarily, this condition being an outcome of the dullness of business generally.

Such changes in prices as are developing are, almost without exception, in a downward direction. Mills are repeatedly announcing additional reductions, presumably in the hope of stimulating demand and also as a result of the gradual decline in manufacturing costs. In keeping with the situation in various other industries, wages of paper mill workers are being reduced. The American Writing Paper Company will cut wages 10 to 18 per cent, commencing next Monday, and various other companies are effecting about the same percentage of reductions. Mills in the Middle West are understood to have readjusted wages, and it is said that the situation there has began to improve because of manufacturers being enabled to offer paper at prices which are proving attractive to at least some buyers and causing them to increase their purchasing operations.

The newsprint market, insofar as regards the spot market, displays a decidedly easy undertone. Demand for spot deliveries is dull because of the fact that most publishers find their present requirements amply covered by contract supplies. About the only demand of worthwhile proportions for spot newsprint comes from those consumers who rely on open market purchases to cover their wants and who do not enter into contract obligations. Obviously, this class of consumers are those who use but limited tonnages of paper, with the result that in the aggregate but a slight demand prevails for spot shipments. It is questionable at just how low newsprint can be bought in the open market. There are some supplies in weak hands, and these are being offered out at low prices. Reports have been heard of some lots of news in standard rolls being available at 4.50 cents per pound at producing mills or ex warehouse, and talk of even cheaper prices has been heard. The spot basis nevertheless is still near to 5 cents a pound, most of the representative mills naming that figure, or slightly lower, which, it must be said, is sufficiently low to more or less unsettle the contract situation. There are many rumors floating around relative to further reductions in the contract basis by leading manufacturers, but nothing definite or official has been announced and contract quotations continue to range between 5 and 5.70 cents f.o.b. producing mills for second quarter delivery.

There are no important changes reported in book papers. Demand is narrow and most book mills are running on short schedule but quotations are about at last-reported levels. The coarse paper trade is dull. There is the routine demand of course, but no concerted buying is being done except by those consumers using small quantities of such paper. No. 1 domestic kraft is quotable at around 8 cents per pound at mills, and No. 1 white tissue at an average of $1.75 per ream.

Fine papers are moving in limited amounts. A little better demand is reported for certain of the cheaper-priced lines of writing papers but mills in the New England district are not beginning to secure enough business to keep them occupied. A paper merchant who made a trip through the fine paper mills this week reported that from his observations he would judge that the average paper plant in the section around Holyoke and Springfield, Mass., was not operating at more than three days a week, and he added that some mills were closed down altogether temporarily.

The board market is more or less demoralized. Demand is at a low ebb and prices appear to be dropping continuously. Composition among manufacturers to get business in order to keep running is bringing prices down to unwarranted levels and most of the board being marketed at present is sold at a loss to the manufacturer. Offerings of plain chip board at $30 per ton f.o.b. mills are quite numerous, and there have been at least some sales at $27.50, while filled news board is quoted at between $32.50 and $35 at mills.

GROUND WOOD.—The mechanical wood pulp market is devoid of important trade activity. Occasional sales are reported at a low price basis but dealers and mill agents are unanimous in their assertion that little or no concerted buying is being done by consumers, who evidently have present requirements covered by stocks on hand and contract shipments and who are declining to place orders ahead. It is difficult to say just what constitutes the market value of ground wood today. Such transactions as are being recorded are invariably at about $45 per ton or less at grinding mills, yet some of the largest producers are said to be holding for $60 and higher. It would appear therefore that quotations range from $40 to $65 per ton, with buyers acquiring such amounts as they immediately need at close to the low edge of this quotational range.

CHEMICAL PULP.—Both buyers and sellers of chemical wood pulp are pursuing a waiting policy at present. Buyers are evidently not in want of fresh supplies and are keeping out of the market excepting for the occasional placing of an order, and sellers presumably appleciate that endeavour to persuade consumers to absorb pulp under prevailing conditions is merely a waste of effort and are holding back in trying to effect the movement of stocks. Prices on all grades of pulp are unsettled but are undergoing little broad change. There is a feeling among traders that approximate value levels will rest at around current prices until at least the spring, and producing mills with few exceptions are not altering their contract basis. Neither are importers cutting prices any further because the cost of pulp at primary points does not permit them to.

RAGS.—There is but a slight demand for paper-



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making rags. Consumers in a majority of cases are out of the market entirely as buyers, while those few that are buying are absorbing merely small lots needed to fill in actual wants. Chief activity in the trade revolves around roofing stock. Felt mills are buying this class of rags here and there wherever they can obtain them at the prices considered as approximate market levels, which means about a cent per pound or a trifle higher at shipping points for No. 1 packing. Old white rags have eased off within the week, and sales of No. 1 repacked have been recorded at 7.50 cents a pound at dealers' points, and of No. 2 repacked whites at 4 to 4.25 cents. Thirds and blues are little wanted by mills and the approximate quotable basis on repacked thirds is 2.50 cents. New cuttings continue weak and are mainly neglected by buyers. Prices are gradually sagging although no sharp recessions have occurred this week.

PAPER STOCK.—Paper and board mills are doing little buying of old paper. Some orders of course are being placed, but the current movement into consuming channels is of smaller volume than in the recollection of some of the oldest members of the New York trade, and there are no indications of any material improvement in demand in sight. Low grades already are at price levels where there is practically no profit for collectors or packers, which is the only apparent reason that values are not going further down, while high grades are slowly but steadily seeking lower levels. Sales of No. 1 hard white shavings at 4 cents per pound at shipping point and of No. 1 soft white shavings at 3 cents have been noted, and these prices are about the highest offered by mills now, with some reporting purchases at slightly less. Old books and magazines are off further to about 1.25 cents a pound for No. 1 heavy book stock at shipping points, and white blank news cuttings have sold to mills at 1.75 cents f.o.b. dealers' points. Folded newspapers are quoted at 55 to 60 cents per hundred pounds and No. 1 mixed papers at about 40 cents.

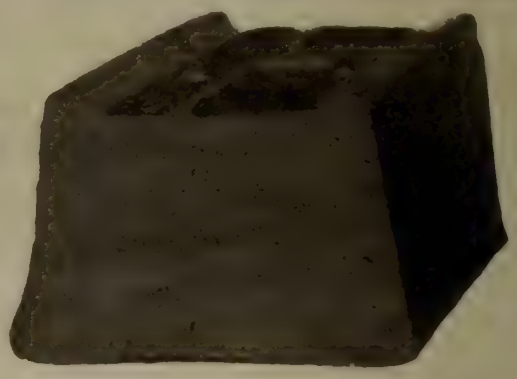
OLD ROPE AND BAGGING.—Some business is passing in old manila rope at a price basis of between 3.75 and 4 cents per pound for No. 1 rope at shipping points. There is also a limited call for mixed rope and strings with mill buyers paying close to 1.25 cents net to shippers. Old bagging is not wanted by consumers and prices are altogether nominal.

I'm awfully tired of kicking,
All I want's a little peace:
But the wheel that does the squeaking
Is the one that gets the grease.

News From Our Advertisers

The Mount Royal Metal Co., 31 St. Nicholas Street, Montreal have just issued a new booklet on Durite Metal. They claim that Durite is the result of an exhaustive scientific research with a view to producing a fine uniform grain. Such fine grain would be evident in the fracture of the metal and this is shown in the illustration herewith.

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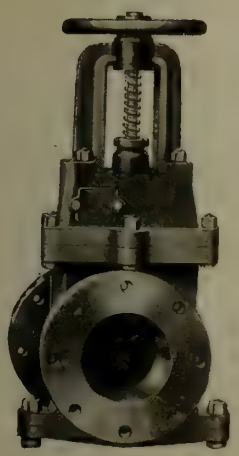
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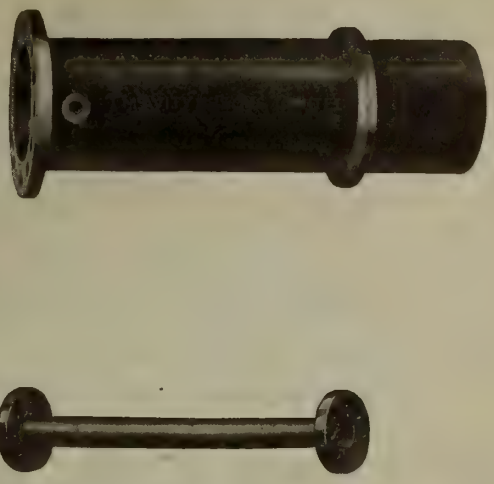
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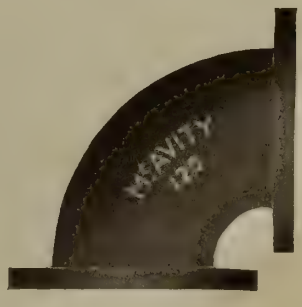
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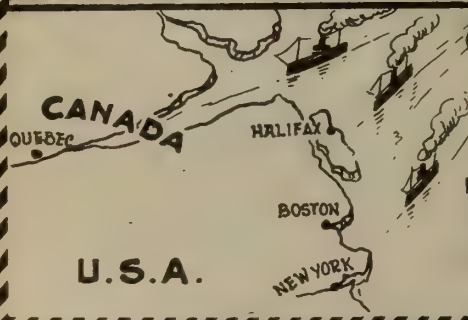
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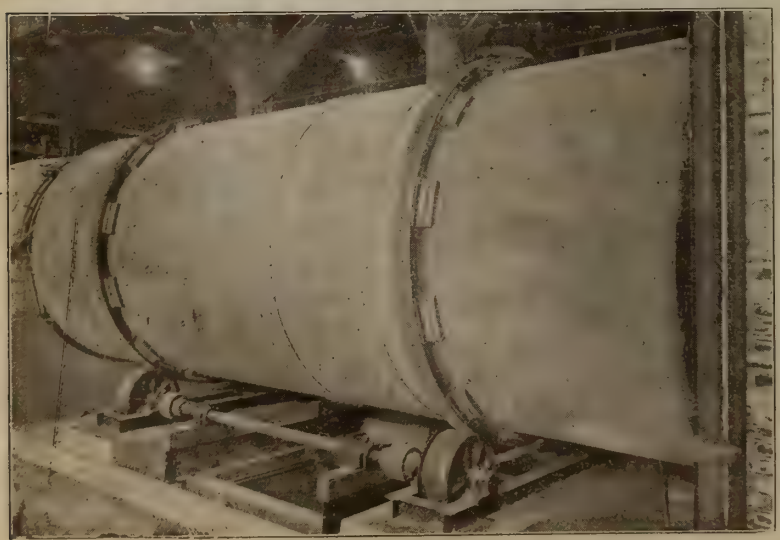
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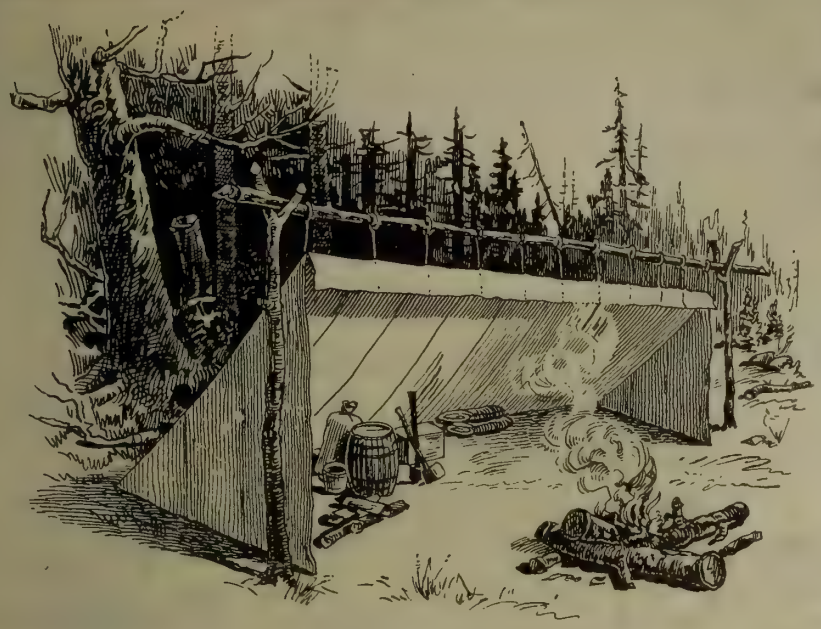
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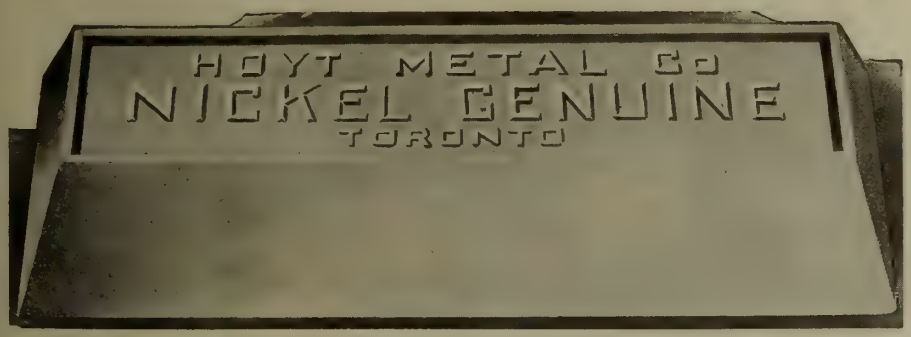
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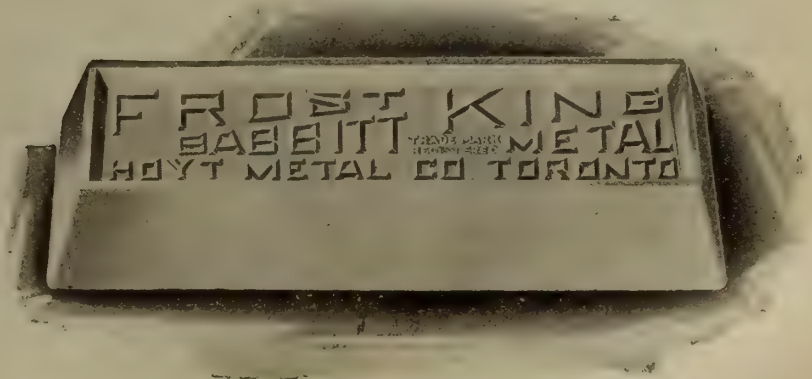
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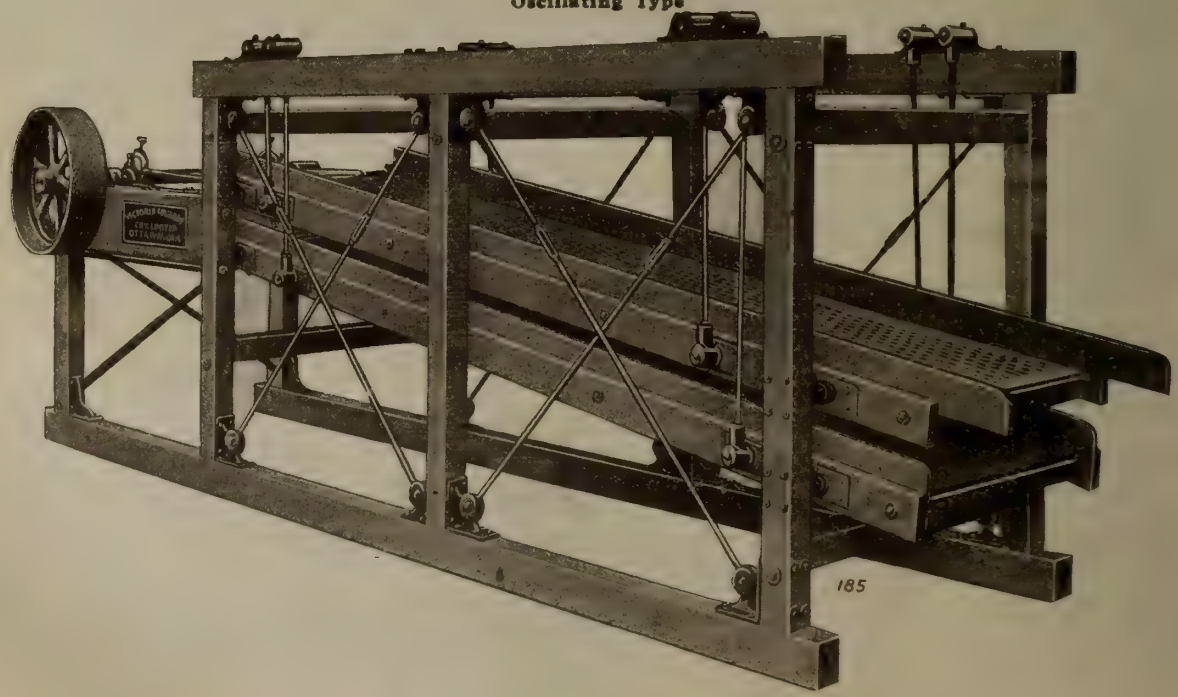
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VOL. XVIX. **GARDENVALE, P. Que., March 24th, 1921.** **No. 12**

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal,
'Phone Uptown 7773.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

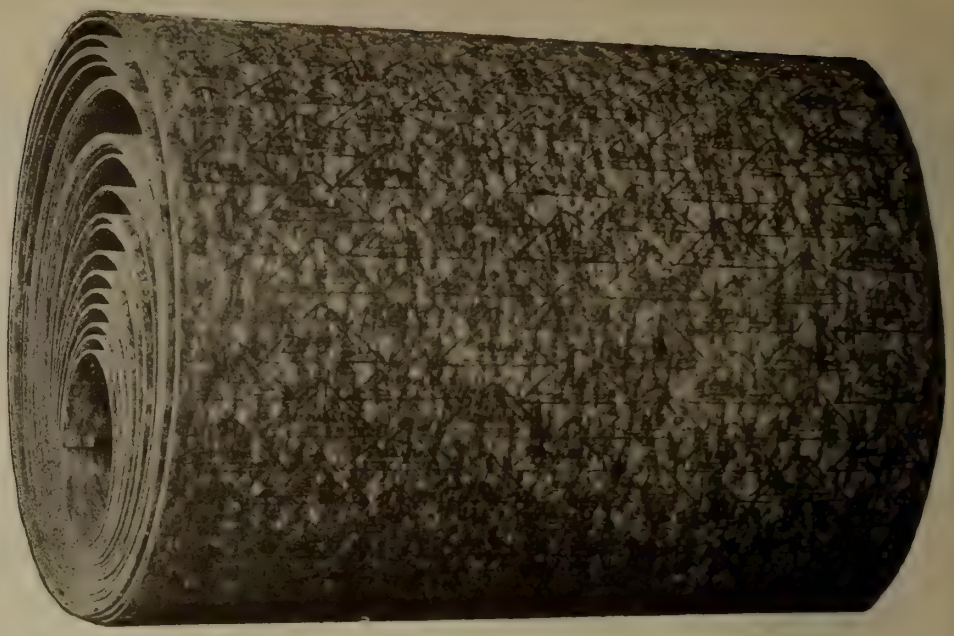
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EDITORIAL

ALASKA'S PAPER MILL.

Perhaps some pulp and paper men have looked with a bit of apprehension on the announcement that the first paper mill in Alaska is now producing pulp. To be sure, the initial output is only twenty tons per day, but the potential capacity of Alaska's forests makes it easy to imagine a very considerable development of this industry in America's most northern territory. There are of course, geographical, industrial and social difficulties to be overcome but it is generally noticed that what the public wants it gets. The people of the United States must have lumber to build houses and they are equally insistent upon having the daily newspaper and the wrapped package. The exploitation of the forests of Alaska is therefor an absolute certainty. The forests of the eastern United States have practically gone, the great long leaf pine forests of the south will soon be insufficient for even local requirements, the hardwood belt is already slipping from its ability to supply the demand, and the forests of the Rocky Mountains and Pacific Coast regions are already fairly well opened up —and burned up, we might add—so the Alaskan timber is the last stand for the American industries depending upon the forest for raw material.

Canadians have been inclined to look upon British Columbia with about the same ideas of a limitless timber supply which they used to attach to the forests of eastern Canada but the fallacy of such a notion has been pretty well impressed of late upon the public as regards the east and a suspicion that conditions are not any too satisfactory in the west has been gradually growing. Careful observers like Judson Clark, Roland Craig and others are now courageously putting the facts before the people. There may be a tendency on the part of some timber owners to gloss over or to discount the statements made regarding the shortage of timber in the Pacific province because of the fear that stock prices might possibly suffer. It is our opinion that it is much better for the public to know the truth of the matter even at the expense of a few points on the stock market than that the next generation of Canadians should be almost absolutely without timber. As a matter of fact we believe that a true appreciation of actual conditions will have such an effect on timber operators that they will immediately put into force methods of lumbering that will ensure the continuity of their forests and consequently the stability of their investments.

So instead of apprehension for the dominance of our pulp industry over the new Alaska developments, we should really look with satisfaction and gratitude on any move which will relieve what will soon be an enormous strain on our own available timber resources. While this development is going on, and it is beginning at a very fortunate time, let us be preparing for the inevitable crisis by better protection, better operation, greater reforestation and, eventually, continuous production.

MAKING OUR OWN COAL.

At the summer meeting of the Technical Section last June, a very interesting paper was presented by Dr. R. H. McKee, and printed in the "Pulp and Paper Magazine" for July 8th, 1920, on a process for making ethyl alcohol and fuel from sulphite waste liquors. On another page of this issue is an article descriptive of the method most generally used in Europe for recovering those same products. It will be noted that twenty-one plants are making 95 per cent alcohol at the rate of 5,300,000 gallons per year in Sweden alone. Some of the mills have introduced the additional step of converting the solid material in solution or suspension after the fermentation has taken place, into dry fuel and the so-called coal thus recovered is not only sufficient for running the alcohol and fuel recovery department but to furnish in addition a considerable contribution to the power plant of the sulphite mill.

Experiments, not only in Scandinavia, where the war made it necessary to find a substitute for gasoline, but also in England, Australia and the United States have shown that alcohol with a small addition of a priming substance such as benzol or gasoline or ether makes a very satisfactory and powerful fuel. This is particularly satisfactory in stationary engines but can be used effectively in motor boats and automobiles as well. The large sulphite plant of the West Virginia Pulp and Paper Company at Mechanicville, N. Y. is already turning out sulphite alcohol and no doubt other plants will soon follow their lead.

In Canada there are several peculiarly important reasons why such a process should be of great economic value. In the first place it is economically ridiculous to employ grain as a raw material for the manufacture of alcohol when a waste product which would produce it at cheaper cost is discarded. There are those who would call it a crime to convert the principal food materials into alcohol whether for consumption, the manufacture of chemicals, or for fuel. Another important factor in the situation is the growing scarcity and continually rising prices of motor fuels. When it becomes necessary to squeeze the gasoline out of natural gas and to break up burning and light lubricating oils in order to augment the supply of this liquid it will be seen that we are not far from the time when it will be absolutely necessary to evolve another liquid fuel for internal combustion engines. Work has already been successfully carried out

in the development of carbureters and ignition sysytems for the satisfactory handling of enriched alcohol mixtures for such a purpose.

Perhaps the most important factor in the situation, especially in Canada, is the fuel feature. The scarcity of bituminous coal in Eastern Canada and the dependence of our industries on our neighbor for coal, especially in Quebec and Ontario, greatly increases the importance of a process which can economically produce a satisfactory substitute from what is otherwise an almost total waste; in fact the effluent from a sulphite mill is not only a waste product but is frequently a nuisance. If the figures of Mr. Clementson giving $5.13 as the cost of producing a fuel equivalent to a ton of good bituminous coal are within half that value of the actual cost, it would mean that any sulphite mill in Canada could produce its own coal at considerably less than cost at nature's product at the mill. The sulphite industry therefor, in developing one of Canada's chief national assets by converting pulp wood into a highly valuable export material the industry would at the same time be assisting in a marked degree in conserving the fuel supplies of Eastern Canada and would greatly diminish the quantity of imported coal and thus relieve the exchange situation.

To make such a development of the greatest value to the Dominion it is essential that there be no duty on alcohol for industrial purposes. With such a supply of cheap alcohol as the sulphite industry could easily produce, Canada might very soon become a very important manufacturer of chemical products using alcohol as a basic or intermediate raw material. Here again, by encouraging manufacturing industries requiring cheap alcohol, the Government would be further relieving the people of the exchange incubus which is proving such a serious burden to most of our trade.

Canada is employing a rapidly increasing number of motors, both for private and commercial use. The motor truck is superceding the horse for heavy hauling just as the automobile now dominates in the field of pleasure or business driving. Tractors have proven efficient and economical on the farm and in the forest and we may even one day find our trains hauled by motors, especially through forest districts. The increase of automobiles and trucks in the United States is rapidly overtaking the supply of gasoline to keep them going and the price of this fuel must continue to increase. Here also, is a situation where the Dominion is depending upon the United States for its fuel supply. Canada can be absolutely independent of our neighbor for motor fuel because we could even manufacture the necessary enriching fuel from alcohol itself by the simple process of converting some of it into ether. The immediate conversion of all Canada's sulphite waste liquor into alcohol would of course completely flood the market at the present time but it takes time to develop a new industry and we believe that now is the time to begin. Furthermore, the public will buy an article which at the lowest price gives satisfactory service and if our Canadian sulphite mills could produce a motor fuel as good as gasoline at a lower price—and we believe they can—success is assured for a process producing two valuable materials, both of which are at present contributing to our national dependence upon another country.

COBWEBS.

An early spring may please the farmers but, with the generally light snow fall last winter, it will make it very hard for driving the year's lumber cut.

The International Paper Co. have revised their price on contracts for newsprint for the next quarter to 5½ cents a pound. That is really a generous act on the part of the company. There is such a thing as reducing the price on wood pulp papers to a point where it amounts to giving away an inheritance. Better sell less and live longer.

The Brompton Pulp and Paper Co. have done another very nice thing. The Technical Section offered three prizes for the best essay presented by students on their summer work in pulp and paper mills. The Brompton Company offered to add 100 per cent to any prize won by a student employee at their mills. This generous offer must have been a great incentive, for two of the winners, out of fourteen excellent essays, were by Brompton men. The company "came across."

CANADA'S WATER FREIGHT.

A recent editorial of the Quebec Chronicle says:

"Now we are privileged to state that a movement is on foot to establish a freight service between the St. Lawrence and Chesapeake Bay.

A prominent transportation man was in Quebec recently looking over conditions and, if the lumber and general business picks up, it is practically decided that a tri-monthly service will be established between Three Rivers, Quebec, New York and Baltimore. Two new 5,000 ton steel steamers have been acquired by the company who are planning this route and they are ready to put them into service, if given any reasonable encouragement, such as should undougtedly be forthcoming.

Railway rates are so high that they are seriously interfering with the movement of raw materials and many commodities, so it is evident that water routes must again be brought into use. The revenue of the Canadian railways will not be affected by the proposed service, so it is expected they will co-operate with a view of giving Canadian shippers an opportunity to resume exporting into the United States, thereby res-toring commercial activity, the balance of trade and parity of exchange."

On investigation, we find that these ships are controlled by New York interests identified with the Pulp and Paper industry and that Mr. Guy Tombs, of the Canadian Export Company, Montreal, has been asked what tonnage would be available from Canada. Mr. Tombs says it will take some time to compile correct and adequate data.

"Ethyl Alcohol" and "Coal" from Sulphite Waste Lipuor

By N. E. CLEMENTSON, Representative in Canada and the United States for A. B. "Ethyl", Stockholm, Sweden.

The following article was prepared for the "Pulp & Paper Magazine" by M. Clementson who is the representative in Canada and the United States for the Ethyl Co. (Aktiebolaget Ethyl) and explains the new methods of that company for the recovery of alcohol and solid fuel from waste liquors. Mr. Clementson is known to a number of Canadian engineers.

The Swedish Manufacture of Sulphite-Spirit.

The sulphite industry in Sweden and the utilization of sulphite-spirit for technical purposes is a subject, which may count upon particular interest in these days of coal shortage and rising oil prices.



The commercial sized experimental plant where the methods of the Ethyl Company were perfected and where research is constantly going on.

The task of the "Ethyl-Company" has been, and still is, to turn to account the organic and inorganic substances in the refuse lye from the sulphite cellulose industry.

That industry, as well known, produces what is called chemical wood-pulp from wood by boiling it with "Sulphite-acid". In this process there is obtained, as by-product a refuse lye (sulphite-lye), containing both organic and inorganic substances from the wood and sulphite acid. This lye, which formerly ran to waste in the watercourses and there caused damage and various nuisances, spoiling the fishing, etc., contains about 50 per cent of the wood used, which amount has thus been lost. In 1909, when about 385,000 tons of sulphite cellulose were manufactured in Sweden, there thus ran into the watercourses a quantity of wood substance that was at least equally great. Since then this quantity has risen enormously from year to year owing to the great development of the sulphite cellulose industry. In 1909 as mentioned before, the output was only 385,000 tons, but as long ago as 1912 it had risen to 670,000 tons and in 1916 to 771,000 tons. During the last few critical years, owing to causes connected with the war and its sequel, the output has not attained this figure; but there is every reason to believe that the sulphite industry will continue to develop in the future.

It is quite natural, therefore, that chemists all over the world should have worked with the object of taking into account the valuable substance in the refuse lye; and in fact this work began as early as 1887. As a link in this chain of endeavour the "Ethyl-Company" was founded in 1909 with the object of working certain patents held by Mr. Gosta Ekstrom, the inventor of Ethyl Company's methods.

It was at Skutskar sulphite plant the 24th of May 1909, when the first manufacture of sulphite-spirit in the whole world began.

The Methods of the "Ethyl-Company".

The amount of fermentable sugar, which is formed during the "sulphite cooking", is depending on several factors such as the quality of the wood and the sulphite acid and also the temperature and time of cooking. As these factors are different with different methods of cooking to obtain varying qualities of the sulphite cellulose, the amount of fermentable sugar in the sulphite lye also varies at different plants and even at the same plant. Of course, the amount of dissolved organic substances also changes, and varies between 10.5 oz. to 23.3 oz. in the gallon sulphite lye. The quantity of this sulphite lye also varies, but is, together with the sugar-percentage, largest at such plants, that cook with direct steam and produce bleached sulphite pulp. When the cooking is completed the lye is drawn to one or more collecting tanks. This lye now contains besides water,



The ethyl alcohol and coal plant which is operated in connection with a Swedish sulphite pulp mill. The large building at the left is a part of the sulphite mill and in front of it are shown the neutralization tanks from which the liquor goes for fermentation and distillation to the buildings in the centre, while the coal plant is shown at the right.

free and bound sulphurous acid, organic acids, fermentable sugar and unfermentable sugar, organic sulphonates, etc. In the procedure of manufacture the sulphonic acids and the greatest part of the organic acids are separated and taken care of, and the remainder, which is the fermentable sugar, is converted into alcohol (C_2H_5OH). When the alcohol is made, there remain in the sulphite lye, unfermentable sugar and organic calcium sulphonate, which have not been changed during fermentation, rather purified, and which are good as raw materials for other industries such as artificial "coal making", a procedure which will be treated later.

The Manufacture of Ethyl-Alcohol (C_2H_5OH).

As the sulphite lye is drawn from the digesters at certain intervals it is necessary that the collecting tanks (A) are made big enough so that the spirit factory can work independent from the supply of sulphite mill. The amount of sulphite lye varies greatly, but as an average it is about 1,452 gallons per ton manufactured pulp. This is only half of the sulphite-lye in the digesters. The other half follows in the pulpmass and is washed out, but will then be so diluted, that it can not be used.

The sulphite lye is pumped from the collecting tanks up to the neutralization tower (B) in which it is neutralized with limestone and lime and at the same time is stirred up by blowing in steam from underneath. This method is very simple compared to the use of expensive and delicate tubes. After the neutralization the sediment is allowed to settle, and the almost clear lye is drawn off to the clearing tanks (C), where any remaining slime is allowed to settle. The temperature of the lye is now between 158 to 175 degrees F. From the clearing tanks it is pumped through a cooling tower (D) to fermenting tanks (E), where the temperature is brought down to 86 degrees F. In the fermenting tanks (E), where the first alcohol is produced, is added yeast and nourishment for the same, as the lye does not contain any substance to feed the yeast cells. When the fermenting procedure is in action the yeast becomes 10 times larger, thanks to the presence of the nourishment. The extra supply of yeast which is received this way, is carried over as the nourishment for the next fermenting process. A loss of nourishment, that can not be avoided is replaced by sulphate of ammonia or superphosphate or phosphoric acid. The lye which is now fermented, contains 1 per cent alcohol by volume and is pumped to the supply-tanks (F), in which the carbonic acid, formed during fermentation, is separated. From these tanks the "mash" is pumped continuously to the elevated "mashing tanks" (G), from which the liquid runs down to the distillery apparatus (H). From here the liquid is continually delivered as 95 per cent ethyl alcohol. In order to control the amount of spirit that goes through, it is delivered to measuring tanks (I), and from there to the tanks (K) in the Spirit storage house.

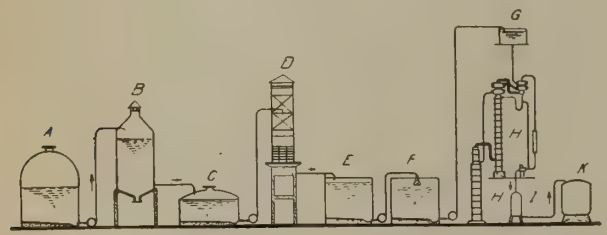


Diagram of Sulphite Spirit Plant

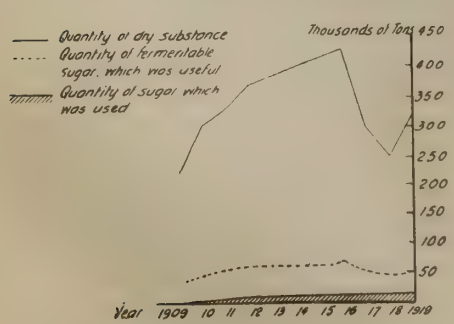


Diagram showing amount of substances in Sulphite-lye during the Swedish manufacture for the period 1909 to 1919

The Development of the Sulphite Spirit Industry in The World.

As has already been mentioned, it was the "Skutskar" sulphite works, that first took up the manufacture of spirit from refuse lye. At the experimental factory the output per day was 457 gal. of spirit of normal strength (50 p.c.) or about 148,000 gal. per year. This manufacture made such a profit that the Company soon determined to extend the plant to take care of all the lye from the sulphite factory. Since the spirit factories at "Kvarnsveden" and "Bergvik" came into existence in 1911, the output capacity in Sweden was 1.4 million gal. of 50 p.c. spirit per year.

In 1916 there was started a new factory on the Gota river with an output capacity of about 610,000 gal. spirit of normal strength.



A view of the tanks in the fermentation building. The evolution of carbon dioxide is shown by the foaming of the tank in the foreground.

In 1918 six more factories were started with an aggregate capacity of about 2,680,000 gal. of 50 per cent spirit. In the following year 1919, yet another six factories were started with a capacity of about 2,700,000 gal. of normal strength. In year 1920 a further five factories are ready with a capacity of 2,500,000 gal. of spirit of 50 per cent strength. Therefore 21 factories are at work in Sweden, which at full work, can produce 10,000,000 gal. spirit of normal (50 p. c.) strength per year or 5,300,000 gal. at 95 p.c. Nevertheless these factories would utilize only a minor part of the refuse lye, that is obtained from all the sulphite cellulose works in Sweden.

By the close of 1911 the Company had the satisfaction of seeing its methods for the production of sulphite spirit embraced with so much interest in America, that the largest American firm in the cellulose line, namely, The West Virginia Pulp & Paper Co., resolved to erect a sulphite spirit factory at its sulphite cellulose plant at Mechanicville. Great interest was also displayed in France, Austria-Hungary and Germany. In Switzerland where there was only one considerable sulphite factory, namely Cellulosefabrik Attisholz A. G.; that company resolved in 1913 to lay out a sulphite spirit factory on "The Ethyl Co." methods.

As early as the summer of 1916 the German Government had made a contract with "The Ethyl Co." for manufacturing licence for sulphite spirit and in the spring of 1917 the first factories had started working.

In Norway and Finland also during this period so much interest had been aroused, that four factories were erected in Norway, while in Finland the "Ethyl Co." methods for the manufacturing of sulphite spirit were purchased by the Finnish Senate. In that country six spirit factories were planned and drawings completed for them.

"The Ethyl Co". can thus look back with satisfaction on well planned work during the last decade for the exploiting of its patents in the sphere of sulphite spirit—a work which has yielded the magnificient result, that no fewer than 45 sulphite spirit plants have been erected or planned on the Company's methods in the world.

The "Quality" of Sulphite Spirit.

As people outside the chemical world seem to consider sulphite spirit the same as wood alcohol it is worth while to mention the great difference.

Wood alcohol consists mainly of methyl alcohol, which is written chemically as CH_3OH. It is obtained in dry distillation of wood and separated from the tar and water mixture in column apparatus. The wood-alcohol obtained here is sold as such and contains besides methyl alcohol, acetone and higher ketones together with empyrheumatic substances. It has a bad smell and is poisonous.

The sulphite spirit is different from wood alcohol, made by fermenting cellulose sugar and consists of ethyl alcohol, which is chemically written C_2H_5OH.

Ethyl alcohol is practically made by the fermentation of liquids containing sugar. As starting material most commonly used "starch" is the most prominent. Starch is easy to obtain and easy to convert to fermentable sugar.

The fact exists, that cellulose also can be changed by the action of certain acids on fermentable sugar. It is by hydrolysis of the cellulose and also from other factors, that the refuse lye from sulphite pulp manufacture contains a certain percentage sugar. It is therefore natural, that alcohol produced from this sugar will be just as pure as if made from sugar derived from starch. It has been shown by tests made by this Company, that the raw product received from distillation of the fermented refuse lye is more pure than the same product from potatoes or grain.

From the following table it is perfectly clear, that the sulphite spirit is just as good high grade spirit as spirit obtained from grain or potatoes. The latest products received from the new distillation plant at "Gota" compared as superior to grain and potato spirits.

The use of sulphite spirit for technical purpose.

Besides being used for human consumption, spirit is mainly employed in the chemical industry for heating and lighting purposes and as a fuel for motors.

In the chemical industry spirit is used for the production of ether, acetic acid, pharmaceutical preparations, such as chloroform, chloral, iodoform, etc., in the manufacture of aniline dyes, for the preparation of polishes and varnishes, as solvents, etc.

For lighting purposes it can be used to heat the incandescent mantles such as Auer and Welsbach make. For heating purposes spirit has mainly been used in small apparatus in households and in industry as in spirit lamps for cooking food. Its extensive use for this purpose has not been due to its cheapness in comparison with other fuels, but rather to the fact that, owing to its many sided usability, cleanliness and convenience, it has advantages over other liquid fuels.

The use of spirit as fuel for motors.

In 1916 there was published the result of an inquiry, made under the Swedish Board of Trade into the usability of sulphite spirit for driving motors; and the main results of this inquiry were the pronouncement, that sulphite spirit was suitable motor fuel, and that special advantages could be gained, if motors were constructed specially designed for spirit. During the war it has been necessary to use sulphite spirit to a very great extent for driving motors in Sweden, and the experience thus obtained has confirmed the correctness of the pronouncement recorded above.

Any petrol motor can be worked with spirit, if a few minor alterations are made. In order that the sulphite spirit might come in common use, it must be able successfully to compete economically as well as technically with gasoline. If motors of high compression are used the spirit fuel will last just as long as gasoline. All that is necessary is to use the Ethyl Co's new carburetor "Asmo"—a suction carburetor, which is very simple in construction and which can be used for gasoline just as well as for spirit. This carburetor has shown in comparison with the best makes in the market, that it is more fuelsaving than the others. It is now in steady use by the omnibuses in London. Without any extra

Table to compare samples of "Ethyl alcohol" from:—

	Sulphite-lye.	Grain	Potatoes
1. Specific Gravity	0.8107	0.8101	0.8096
2. Percentage alcohol	96.53%	96.67%	96.78%
3. Appearance. — All solutions clear.			
4. Diluted with twice the volume water. — All solutions perfectly clear.			
5. Residue from evaporation per liter	0.090 gr.	0.0290 gr.	0.0064 gr.
6. Total percentage of acids expressed in cc. n/10 NaOH, per 50 c.c.:	0.05	0.05	0.05
7. Test for higher alcohols. — No smell of higher alcohols. No residues.			
8. Barbéts fine alcohol tests; Time in minutes			
After: 1st. minute	Red	Salmon color	Red
2nd. —	same	same	Salmon color
3rd. —	same	Yellow	same....
4th. —	same		Yellow
5th. —	same		
6th. —	Salmon color		
9th. —	Brown red		
20th. —	Yellow		
9. Aldehyde test	Dark red	Dark Red	Dark Red
10. Vitalis test. — After several hours, no rose-red zone.			
11. Furfurol. — All clear. No coloring			
12. Sulphur. — Hardly noticeable trace.			

device it sucks the fuel as high as 7 feet, which makes it independent of the elevation of the fuel tank. This, together with eliminating the vacuum tank, makes it very convenient for automobiles and motor boats.

If sulphite spirit is used for motor fuel it has to be carbureted by 10-15 per cent benzol, which also serves as methylating fluid, thereby making it useless for drinking purpose.

Benzol is obtained as a by-product in coke plants and gas works to a great extent, there is no reason why sulphite spirit should not have a great future on the American Continent compared to the more expensive gasoline.

The world supply of oil running dry.

It is asserted in certain quarters, that the world supply of mineral oil (petroleum) is so great, that there can be no question of any shortage of petroleum or petroleum products within any measurable future. But if one looks at the petrol question as a whole one comes to another conclusion. U. S. A. produces 13/20 of all the petrol in the world and itself consumes more than that quantity. The population of the United States forms only about one sixteenth of that of the rest of the civ-



Distilling and rectifying columns in the alcohol plant.

ilized world. From where, therefore, is the civilized world to get its petrol, if motorism in other countries comes anywhere near the same level as America? The United States must, to protect itself put a stop to its export. There is therefore no other course for the rest of the world to adopt but to attempt, as soon as possible, to manufacture usable substitutes. The nation, which at once fully perceives this and acts accordingly will thus, when the critical moments arrives, have the richest experience and thereby gain an incalculable advantage.

There is no doubt that spirit is the fuel which is best suited to from a substitute for petrol, partly because of its chemical and physical properties and partly it can be produced in unlimited quantities. The motor fuel of the future, therefore, will be a mixture of Spirit with Benzol or Spirit with Ether, which is easy to obtain from the spirit itself.

"Coal" out of dry substance enough to drive the whole Sulphite Plant.

After the sulphite spirit is made from the sulphite lye, there is left considerable amount of unfermentable sugar and organic lime sulphonates, which is plainly shown by the above diagram. This residue is made more suitable for "Coalmaking" through the fermentation process during the spirit manufacture. Therefore these industries are intimately connected.

The substances exist in a very dilute solution and it is necessary to get them in concentrated form. The solving of this problem is therefore dependent upon the possibility of separating the dry substance from the water at reasonably low cost. The separation of the water from the dry substance can be done either chemically or through evaporation.

The chemical method.

This method aims to transform the easy soluble dry substance in the sulphite lye to an insoluble sediment, which can be separated from the main part of the water and the rest of the water is then taken out by centrifuge and drying. It has, however, been shown, that only 75 p. c. of the dry substance goes into this sediment. On account of this and the high temperature (200 degrees C) at which this process has to be worked it is very uneconomical. The practical use of this method is hampered also through the fact, that the sediment must occur in sour sulphite lye.

The Evaporation method.

This method has many advantages, no loss of dry substance and relatively low pressure and temperature, but it is entirely depending upon the degree to which the heat from the evaporation steam can be utilized. In order to take care of the evaporated steam, it is necessary to put the lye in boiling and to keep the escaping steam at such a high pressure, that the heat from this steam can be used to generate more steam. It is also to be observed, that the amount of in-going steam must at least be as large as "the evaporated". There is at present no apparatus in the market, which can claim to do this.

In regard to the treatment of the sulphite lye, its collodial nature must also be considered and also the fact, that all water must be driven off in order, that the remainder or dry substance can be used as fuel. It is possible to increase the pressure of the escaping steam, so it can be used to heat the evaporators in order to generate more "evaporated steam". The compression of the escaping steam * naturally requires a certain amount of power, which is dependent on the heat transmitted per square inch and of the surface. The transmitting intensity (greatest temperature diff. per second per unit area) is very large in "The Thunholm Evaporator" and in using them economical evaporation results are obtained and therefore this problem can be considered solved.

The Thunholm Evaporator differs from others in that the heating surfaces are flat ring-shaped plates and not tubes.

The factors, which influence the transmitting intensity are as follows:

1. The depth of liquid on heating surface.
2. The cleanliness of the heating surface.
3. The heat conducting capacity of the material in the separating wall.
4. The absence of condensing-water on the opposite surface.
5. The speed of steam over this surface.

The construction of "the Thunholm Evaporator" makes it possible to satisfy above conditions. The evaporation is continuous from inlet to outlet and transmission of heat is done under the most favorable circumstances, the movement being from bottom towards the top.

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* The steam, or vapor evaporated, is mechanically compressed, and thereby "charged" with more heat units.

1. The depth of the liquid can be selected according to the nature of the solution.

2. The cleanliness of the heating surface is provided for by slowly rotating scrapers.

3. The heat conducting capacity of the material in the separating walls is made large in that the plates are very thin and spliced in a special manner.

4 and 5. The absence of condensing water and the speed of steam is made large by specially constructed canals between the two bottoms, so that the condensing water is thrown away from the bottom surface of the plate by the great rush of the steam.

As an example of how well this apparatus transmits the heat it can be mentioned, that with a difference in temperature of 6 degrees C. between the steam and the solution 100 kg. steam per square meter per hour was evaporated.

The concentration to which the solution can be evaporated is determined by the viscosity of the same. The evaporation can continue until crystallization begins. For the final drying process a special apparatus is used.

The energy which is used to compress the steam is, per cubic meter of lye, about 30 horse power. If water can be used it is the cheapest. If the dry substance derived is used for firing to evaporate, the cost is equal to zero; of course this reduces the amount of dry substance obtainable for firing purpose in other parts of the manufacture. One cubic meter of lye gives 125 kg. dry substance with a heat value of 3,800 Cal. per kg.

The Price of This "Coal."

In general 30 times 3,500, (=105,000) Cal. is used in an up-to-date power station to generate 30 horse power.

The total heat energy from 7 cubic meter lye in dry substance is equal to 125 times 3,800 equal to 475,000 Cal; therefore 22 per cent of total heat energy from the lye is used for evaporation purposes, and the remaining 78 per cent or 97 kg. dry substance can be used for the other manufacture. The cost to obtain these 97 kg. dry substance is therefore dependent on the cost of installation and the interest on the capital cost and also on the operation.

The cost per installation per cubic meter lye for one year is about 1·25 dollar. If the interest on this is 18 per cent and the cost of operation is equal to 7 cents, the total is equal to 0·18 times 1·25 plus 0·07 equal to 29·8 cents. The cost for 1,000 kg. coal will accordingly be equal to 2·98 dollars or say 3 dollars a ton. This price equals $5·13 per ton of best coal (6.500 Cal.) How important this is for a sulphite plant, which generally lays in places, where coal is not obtainable, can easy be figured out.

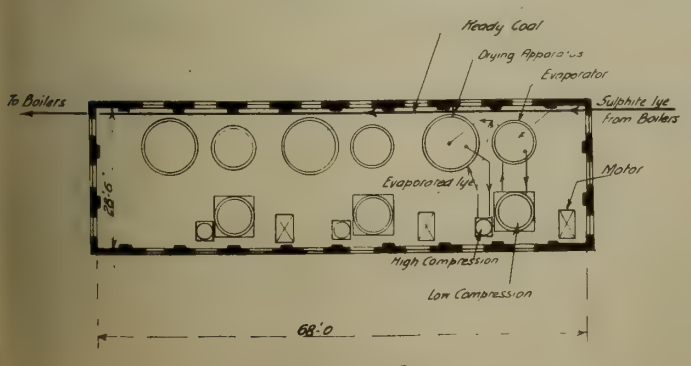


Diagram of Coal Plant.

The amount of fuel which can be obtained per ton dry pulp is of course dependent on how large a quantity of lye can be received and washed out before getting too diluted. It can be figured to 6 cubic meter per ton dry pulp, which makes (with 97 kg. fuel per cubic meter lye) 580 kg. fuel per ton dry pulp. This quantity is enough to cover the need of the sulphite plant for fuel, provided the fuel consumption at the plant is treated in an up-to-date manner.

5. Below is shown a plan of a "Coalplant" for a sulphite factory with the capacity of 22,000 tons dry cellulose per year.

Production Cost of Sulphite—Coal.

Sulphite production, 70 ton pulp per day.

Waste Liquor Recovery, 5·5 cubic meter per ton pulp.

Yield of Coal, 125 kg. (275 lbs.) per cubic meter waste liquor.

Production Cost per Cubic meter Evaporated to 125 kg. Coal.

Labor Cost and Management—
- 5 laborers at $4.50 pr. weekday $22.50
- 1 Superintendent, per weekday 7.00

$29·50

At 70 tons a day at a day at a rate of 5·5 cub. met. pr.ton, there is obtained 385 cub. met. daily. The cost pr. cub. met. is therefore, 2,950÷385 .. .. $ 7·00

Light and Power—

30 H.P. are needed to evaporate 1 cub. met. lye, or expressed in kg. Cal, 30x3,500, 105,000kg. Cal. Using coal from the plant itself the amount of kg. Col. available, 125 x 3,800=475 kg. Cal. 105,000 x 125÷475,000, 28 kg. Coal are used. Therefore Coal obtained pr. cub. met. lye is reduced to 97 kg. and the cost to obtain these is equal, $0·00 .. .. $ 0·00

At a building cost of $1·25 pr. cub. met. lye and allowing an annual depreciation on the building cost of 12 per cent and an interest of 6 per cent or together 18 per cent, the added cost for manufacture of 275 lbs. Coal will be, $0·18 x 125 .... $22·50

Total .. .. $29·50

Price per ton of Sulphite-Coal and amount obtained obtained per year—

275 lbs. Coal cost, $29.50.

2,240 lbs. Coal cost, 10.51 x 29 $3.50, per ton.

Amount of Coal (3,800 kg. Cal.) obtained pr. year—

Pulp produced pr. year, 21,000 ton.

Waste liquor recovered pr. year, 115,500 cub. met.

Coal obtained pr. year, 213 x 115.500=24,601,500 lbs. or 24,601,500÷2,240=12,300 ton of Coal, with a calorific value of 3,800 kg. Cal.

Prices and amount estimated in Steam-Coal (6,500 kg. Cal.)—

1 ton of this Coal will cost 6,500÷3,800 (=1·71 x 3.00)=$5.13.

The amount obtained will be, 3,000÷6,500 (=0.584 x 12,300, or 7,200 ton pr. year of the best Steam coal.

Production cost of Sulphite Alcohol.

Sulphite production—20,000 tons pulp per year.

Waste Liquor Recovery—5.5 cubic meter (1455 gallons) per ton of pulp.

Yield of Alcohol—1.1 per cent by volume of Waste Sulphite Liquor (average yield.)

A.—Production cost per cubic meter (264 gallons) of Waste Sulphite Liquor treated.

Raw materials:

Steam: 300 lbs. at 10 lbs. pressure req. 50 lbs. coal (from "coalplant") at $5.13 per ton coal	11.6c
Neutralizing agency: 20 lbs. at $5.00 per ton	5.0c
Chemicals	2.3c
	18.9c
Labor cost and Management:	
7 Laborers at $4.50 per week, day	$31.50
1 Superintendent, per week day	7.00
1 Controller (inspector), per week day	7.00
	$45.50
At 70 x 5.5 cubic meter waste liquor daily or 385 cu. m. is the cost per cu. m. 4550 ÷ 385 = 11.7c	11.7c
Power and Light:	
50 H.P. at 30.00 per year or $5.00 per day, or the cost per cu. m. is 500 ÷ 385	1.3c
Various expenses	2.0c
Materials and repairs	2.0c
Cost per each cu. m. of waste liquor	35.9c

B.—*Production cost of one Gallon 95 p.c. Ethyl Alcohol.*

At 1.1 p.c. yield of alcohol per volume of waste liquor, the amount of alcohol obtained per each cu. m. waste liquor (264 gallons) is 2.9 gallons of 95 p.c. alcohol, or the production cost per gallon of 95 p.c. alcohol is 35.9 ÷ 2.9	12.4c
The annual output of alcohol will be at the yield of 1.1 volume p.c. or 0.011 x 1455 x 20,00 320,100 galls. 95 p.c. Ethyl Alcohol per year	
At a building cost of $180,000 and allowing an annual depreciation on the building cost of 10 p.c. and an interest of 6 p.c., or together $28,800 — the added cost per gallon of alcohol will be — 2880000 ÷ 320100 =	9.0c
The total cost per gallon 95 p.c. Ethyl Alcohol	21.4c

SUGGESTIONS ON HEATING AND VENTILATING PAPER MACHINE ROOMS.

Valuable suggestions on heating and ventilation of paper machine rooms are contained in a paper on this subject by Edward A. Ryan, which is published in the January issue of the Journal of the Engineering Institute of Canada, 176 Mansfield Street, Montreal. Mr. Ryan recommends the combination system of supplying and exhausting air mechanically, and places special emphasis upon the need for a system which will be sufficiently flexible to permit control of the quantity and temperature of air circulated through the machine room as may be required by prevailing weather conditions. Mr. Ryan also discusses the possibilities of greater economy by re-circulation of a portion of the total air handled in cold weather.

The chief advantages of a properly designed and operated ventilating system, according to Mr. Ryan, are increased production due to fewer shutdowns, greater safety for the workmen because of better illumination when the excess vapor is carried away, a more even product resulting from uniform humidity and temperature, and a longer life for machine felts due to decreased moisture content of the air in the machine room. — R. T. S. in "National Safety News".

CONCERN IS NATION-WIDE.

That there is a deep, nation-wide concern over the forest situation in Canada is shown by this letter, which has been kindly loaned to us by Mr Barnjum, whose last contribution appeared in the Pulp and Paper Magazine for March 3rd. Mr. Hibberson's stirring article will be found on another page. His letter is as follows:

F. D. J. Barnjum, Esq.,
Annapolis Royal, N.S.

Dear Sir:

I have read with great interest your contributions to the Canadian Forestry Magazine, regarding the timber wealth of the East and its depletion.

You in the East, are looking towards British Columbia for your future supply of timber, and I am afraid that the bulk of the lumbermen do not realize how little timber we really have in British Columbia. Our firm for the past seventeen years has been examining timber in British Columbia, examining some four hundred to five hundred square miles per year, and incidentally travelling over a tremendous acreage of adjacent timber lands.

Our filings have shown conclusively that our timber wealth has been greatly exaggerated; and whilst we have ample supply for present needs, ten or fifteen years hence, will see, in our opinion, the beginning of a timber famine.

I am taking the liberty of enclosing a copy of an address which I delivered before the Associated Boards of Trade of British Columbia, in Vancouver recently. I think it might be of interest to you.

We have come to the conclusion that British Columbia will be called upon to supply a large proportion of the needs in the very near future. Our pulp wood supplies are very limited; as you know a large proportion of our timber in British Columbia is Fir and Cedar and only on the West Coast of Vancouver Island, the Queen Charlotte Islands and the North East portion of Vancouver Island hold any large pulp wood supplies; the timber in these Districts being chiefly Hemlock and Balsam, or as it is called on this Coast, Larch. There is little Spruce on the Coast of British Columbia, the bulk of our Spruce being in the Northern Interior.

With cordial wishes, we are,

RYAN, McINTOSH TIMBER CO., LTD.,
per R. W. HIBBERSON.

Victoria, B.C., February 22, 1921.

DURABILITY OF RAG PAPERS

As a result of the exhaustive tests made by the Bureau of Standards for the United States, as to the durability of rag papers, the following report has been made:—

"Results of tests upon approximately 150 samples of paper stored since March, 1909, it is noticed that bonds and ledgers, containing 100 per cent rag, did not deteriorate in bursting strength as much as printing, writing and similar paper containing wood pulp. The loss in bursting strength for the first class of paper tested was about 11.9 per cent, while the bursting strength for the second class was 20.4 per cent less than when tested 10 years ago."

Transactions of the Technical Section

The Editor is sorry for the misfortune which caused this excellent paper that Mr. Hoxie read at the annual meeting of the Technical Section to be omitted from the Pulp and Paper Magazine of March 3, when the discussion of this subject was printed.

FIRE INSURANCE OF PULP WOOD.

By F. J. HOXIE, Engineer and Special Instructor, Associated Factory Mutual Fire Insurance Companies, Boston, Mass.

Insurance rates on pulp wood as well as other property are ultimately made not arbitrarily by the insurance companies but by the management of the mills. Still further, the best protection is originated at the mills.

If the loss records of a class of risk shows this class to be unprofitable at the prevailing rate the rate or protection must be increased. It is nearly always easier to increase the rate than to increase the protection as it generally requires a careful study of the process as well as of the fire records to effectively improve the protection without harm to the manufacturing processes.

Not infrequently a panacea or universal protective remedy is applied consisting of more pumps or hydrants which will doubtless improve the fire protection in so far as it applies to the problem in hand, but careful study of fires must be given to determine whether such fire extinguishing appliances can accomplish the desired end with a reasonable outlay.

Prevention is better than cure in fire protection as well as in medicine and it is mostly by carefully administered fire prevention that the mill manager reduces his insurance rate. By care and good judgment he establishes a reputation for a process or industry of which the loss ratio over a long period of time is the final index of success. An observant manager, discovering that a given machine or process is subject to frequent fires puts his mechanics and chemists in search of a remedy. The insurance inspectors in going from mill to mill discuss this problem with different managers thereby getting a great many different opinions, serving as a clearing house for information, distributing the good ideas from mill to mill, collecting the varying fragments of experience and piecing them together, whereby an efficient system of fire protection applicable to this particular machine or process grows rapidly or slowly in proportion to the number of careful observers at work and the speed with which experience accumulates and information is exchanged. Gradually a standard method of protection is formed and the efficiency of this standard protection determines the ultimate insurance rate.

Careless management not only injures the good reputation of a mill but of an entire process, whereas careful and ingenious managers can improve the reputation of a process which has fallen into bad repute. It was this idea of co-operative fire protection which brought the Factory Mutual Fire Insurance Companies into existence and reduced the insurance rate on cotton mills from, in the neighborhood of 2 per cent to one tenth of one per cent.

It is apparent that in this method of rate making the most general and rapid exchange of ideas and experiences will tend to most quickly establish the lowest possible rate, therefore efficient and judicious publicity is desirable. If insurance companies insist arbitrarily on an unjustly high rate the profit will sooner or later attract competition into the field which will bring the rate down. This judicious publicity and exchange of ideas will keep the industry as well as the insurance companies informed of experience and of improved means of combating losses. The insurance companies have no independent source of infallible judgment in connection with new processes. They are entirely dependent upon experience tables in determining the value of protection or prevention and in new methods of protection, experience, of course, which accumulates slowly is not available, therefore the only course of procedure is to be guided at first by the apparent reasonableness of the protection proposed, analyzing the experience, whether good or bad as rapidly as it accumulates. It is thus that the present high efficiency of automatic sprinkler protection has been gradually built up and it is thus that the protection of log piles by water spray must proceed. The starting point is the reasonable premise that wet wood does not ignite as readily as dry and if from any unusual cause such wet wood becomes ignited it burns much more slowly than dry wood, particularly in the early stages of the fire, at which time it can be most efficiently extinguished. These are matters of common experience. The apparatus required for applying spray to log piles is not complicated or expensive. Interruptions in its operation are at once clearly apparent. In this respect it has the advantage over automatic sprinklers in which failures are generally the result of obstructions such as shut valves which are not apparent before the occurrence of the fire.

From the small amount of experience thus far accumulated it appears that common varieties of pulp wood may be kept quite uniformly at from 50 per cent. to 60 per cent. of moisture by means of water spray. This high moisture content will greatly retard the growth of fungus and prevent it altogether during the short periods that pulp wood is commonly stored. It should act more favorably to pulp making processes than present methods of storage, as the uniform though high moisture in the chips should make it possible to secure greater uniformity in the strength of the chemicals in contact with the wood, and although this moisture is high it is not higher than a considerable part of the chips under present conditions of storage. Moreover, some of the chips under present conditions are nearly bone dry, therefore present conditions should give rise to the widest possible variations in the strength of the pulping liquors in contact with the wood cells in different parts of the same charge.

In conclusion, the process of insurance rate making by the mills as described herein is now in active progress. In connection with this work on the fire protection of pulp wood, at least six large mills have installed some form of spray apparatus for continuously wetting piles of pulp wood and are now making careful observations on the effect of this wetting on the pulp and the rotting of the wood. This work has not yet progressed far enough to draw broad general conclusions but a few preliminary reports have been made which are encouraging. The chief object of preparing this paper is to start discussion and make available experience as rapidly as it accumulates.

Nearly two years ago when this method of protecting pulp wood was suggested to Colonel Jones, manager of the Spanish River Mills he stated that he already had under consideration a similar idea and he soon after covered a large pile of pulp wood with spray nozzles

of a form devised by his own engineers. Since that time his research department have been making continuous observations on all phases of the subject and have doubtless already accumulated much valuable data which will be of the greatest service in furtherence of this study.

(Discussion to be concluded.)

British Trade News

(From our London Correspondent.)

London, March 1, 1921.—The British Fair of Industries held in London at present displays exhibits covering 4½ miles. It is representative of all British industry and buyers have attended from all parts of the world on the invitation of the Board of Trade, who sent out thousands of complimentary cards. There is a fine show in the paper section and everything can be seen from newsprint to the finest printings and writings, as well as boards and kraft paper, tissues, and so on. There is also a good display in the stationery section. In connection with the Fair there is the reports credit scheme under which a manufacturer can receive part payment for an order obtained in any foreign country in the scheme. The scheme enables him to be sure of his money, as the Government has a financial agreement in existence with the country to which the finished product is going. There was one humorous element in the Fair the other day. Only British made articles are displayed, but one over-zealous stall-holder unconsciously displayed German-made specimens. The result was the Government shut up the stall very quickly and now it is the scene of much curiosity.

Dividends.

Amongst recent dividends announced by paper mills are Olives Paper Mill, Ltd., who declare an interim dividend at the rate of 10 per cent from July 23, 1920 to January 22, 1921. Annandale & Son, Ltd., are paying 7½ per cent on the ordinary shares and the Culter Mills Paper Coy. 10 per cent. These are very good dividends particularly when one considers the serious depression in the latter part of 1920..

Price of Newsprint.

The question of the price of newsprint has been under consideration by the Paper Makers' Association. Foreign competition and the agitation for cheaper paper has no doubt influenced them in arriving to a decision as this week quotations have dropped 1 cent per lb. The price is now 8½ cents (4¼d.) per lb. and there is every likelihood of it being further reduced in the near future. No doubt the easement in the pulp prices quoted last week has something to do with the reduction in newsprint prices. It is rumored that newsprint is down as low as 8 cents for large consignments; but this price does not yet touch what was being asked a month ago for Scandinavian.

Standardization of Paper.

This is a subject that printers are giving much attention to at present. The opinion of the printing trade is that paper should be sold per "mille" or "thousand," and packed in 1,000's, 500's, or part of a thousand as may be convenient. It it should be essential to deliver an even 500 sheets, it would be necessary for the printer to break into another ream, and unless the paper were usually stocked by the printer, it would be probably much better to purchase an extra quire at a slightly higher price so as not to have oddments of paper. It is also contended that if a customer insists on having a particular paper which is not in stock, and 500 copies, he ought to pay the slight extra cost incurred by buying the odd sheets necessary to give him his exact quantity. These are just little problems the printer is getting ready for the paper makers in England.

The Paper Situation.

The situation in the paper industry shows no improvement and the depression still continues. News has reached London from Scandinavia that inquiries are being made from consumers as to prices and stocks but it is feared these are due to the recent announcements in the pulp industry and that not much weight is attached to them. The British paper makers are mostly concerned with the export trade at present as it is a branch that requires great attention and study, particularly at the present time with German subterfuge methods in existence.

Board Supplies.

During the month of January the United Kingdom imported 129,117 cwts. of strawboards, valued at £121,648; 36,509 cwts of millboards at £71,641, and 16,412 cwts. of cardboard at £56,492. Canada's share in these supplies were as follows: Strawboards, 200 cwts., worth £400; millboards, 11,618 cwts., worth £24,067; and cardboard, 106 cwts., worth £138.

In millboards Canada enjoys a nice trade with the British market. Her rivals are Finland, Sweden, Norway, Germany, and U.S.A. The Dominion, however, tops the list in supplies and next comes Finland and Sweden. In strawboards the Netherlands commands most of the trade and there is much room for Canada's development of trade. The same may be said of cardboard and pasteboard.

Pulp Market.

There is no important business in the chemical and groundwood markets. Good supplies are arriving in the country and quotations are still as follows: Bleached sulphite, £50; Easy Bleaching, £37 7s. 6d; Sulphite News, £32 10s. 0d; Unbleached Soda, £32 10s. 0d; Soda Kraft, £30; Groundwood, 50 p.c. wet, £10; Groundwood, dry, £20. Prices are per ton c.i.f. British ports.

Members of Parliament Debate Pulp.

The House of Commons a few nights ago enjoyed a little debate on woodpulp. It was raised by Horatio Bottomley, the principal owner of the weekly paper in London called "John Bull," who suggested that Germany could help herself in paying the war indemnity by giving England such useful manufactures as woodpulp and that without injuring labor in the country. Mr. Lloyd George asked "How much?" But he answered the question himself. He said, "You would put the mills of Newfoundland out of order, and the Anti-Waste League could not possibly run its campaign. Their election literature might not be repeated and there are some papers that might go out of print. How much wouldpulp would be brought into this country if all of it were brought from Germany? If you said to Canada—we do not want any more stuff from you; and you said to Sweden—we do not want any more from you, we are going to trade with nobody but Germany. All of our papers, weekly and daily are going to be printed on something which will be marked made in Germany. It will be stamped on Mr. Bottomley's paper . . . " The House roared at the way Mr. Lloyd George pulled Bottomley's leg and Lord Northcliffe's papers over the suggestion, which was eventually allowed to fall through.

Conservation of the Timber of British Columbia*

To the average man in the street, British Columbia is all timbered. He travels by train through the interior of British Columbia, or by steamer up the Coast and the country everywhere looks green; therefore it must be timber. If you told him there is every danger of a timber famine in British Columbia within fifteen years, you would be ridiculed; but there is a VERY DECIDED DANGER of a timber famine, and before many years lapse, we will all begin to feel it.

Ten years ago, the centre of the logging industry was within a radius of fifty miles of Vancouver. Today, it is from one hundred and fifty to two hundred miles from Vancouver, and in some cases operators are towing logs as far as SIX HUNDRED MILES to their mills, and an average tow of two hundred miles is quite common.

Ten years ago, the average cost of logging was $5.00 per thousand feet; today it is nearly $20.00 per thousand feet and in some of our Cedar Camps last year, the cost was over this figure.

Ten years ago, most of our logging was done within a mile of the salt water; today we are hauling by railroad ten to twenty, and in some cases more by railroad to salt water, before we commence to tow logs to the mill.

The interior of British Columbia has the same conditions; where formerly saw mills were built in the heart of the timber, today, logs are brought distances up to seventy miles by water and by rail. This means heavy expense and conditions are getting worse every day. The general public is clamoring for cheap lumber. THERE CAN BE NO CHEAP LUMBER IN THE FUTURE, if the logger and mill man is to make a fair profit on their investment. Lumber will steadily rise in price as the timber recedes farther and farther away from centres of population, and the cost of getting the logs to the mill, increases year by year.

Formerly a logger with a capital of five to six thousand dollars, could open up a camp and produce logs; today his machinery will cost him approximately one hundred thousand, before he can commence to operate. I have in mind, one operation, not twenty miles from here, where a logger spent one hundred and twenty-five thousand dollars, building his logging railroad and putting in camps, etc., before he made a cent, then when he was ready to operate, a slump came and he had no market for his logs.

The price of logs governs the price of lumber; and with the consumer demanding cheap lumber, the mill man naturally is demanding cheap logs. The logger in order to get his logs as cheaply as possible is devastating our forests; cutting only the timber that can be cheaply handled, smashing down all the smaller timber in the process of logging and leaving in the woods to rot or to be burnt, some 30 to 40% of the volume of the timber on the ground. He cannot afford to attempt to log much of the timber on the high elevations or on the rough ground; broken timber is left and on most operations on rough ground, fully half of the timber never reaches the mill, it being broken up and left on the ground.

There is no country in the world, that would tolerate the wasteful logging methods practised on the Pacific Coast of Canada and the United States. It is not logging, it is forest devastation. Whom are we to blame?

The logger, in order to make a fair return on his investment, and log all the timber on the tract, carefully taking off, first all the smaller timber, and then logging the heavy timber, must have an increased price from the mill for his logs. Therefore, the consumer cannot look for any cheap timber in the future, as the cost of operating is continuously climbing.

We have been credited in British Columbia with having 350 billion feet of standing timber. Of this I have no hesitation in saying that there will not be 100 BILLION FEET actually taken to our saw mills in the form of saw logs. This figure of course refers to our virgin timber. Our present output is approximately two billions of feet per year; this figure will be more than doubled within five years, and by 1930 British Columbia will be called upon to supply at least six billion feet per year, possibly more.

As is well known, the Eastern United States is almost denuded of timber, they are already dependent on Eastern Canada, the Southern States and the Pacific Coast for 90 p. c. of their domestic requirements in lumber. The Southern States which now cut approximately twelve billion feet per year, will, within seven years, cease to be an exporter of lumber, and the Pacific Coast will be called upon to supply the deficiency.

The United States annually uses 38 billion board feet of lumber; that is to say, all the saw timber we have in British Columbia would only last the people of the United States three years. Her wood fuel consumption is enormous. Last year, it was 110 million cords. The United States Railroads used annually, 125 million railroad ties, and six billion feet of timber is used just for boxes, crates and barrels.

Already the people on the other side of the line are preparing for a timber famine. Reforestation is practised in many of the Eastern States. The pulp and paper companies, who formerly were self-supporting in pulp timber, now obtain 2/3 of their pulp, paper or pulp wood from Canada; and if as is quite probable, Canada prohibits the export of pulp wood across the line, most of these companies will be put out of business, and investments totalling hundreds of millions of dollars will be wiped out.

In Quebec and Ontario, the large pulp and paper companies realize the necessity of continuous supply of timber; and although they still have thousands of square miles of timber, they are now engaged in systematic reforestation on the cut over areas; as fast as a tract is logged, they plan to reforest it. Their logging methods are supervised by Government foresters, and no waste is tolerated. The Government of the Province of Quebec is now planning to fix the maximmum annual cut of timber and also a minimum cut, to stop speculation on Government lands. They have sent young forestry engineers to Europe, to study the best forestry methods and are engaged in reforestation on a large scale.

It is time that British Columbia took warning and re-organized their Forest Branch.

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* Address recently delivered in Vancouver before the Associated Boards of Trade of British Columbia, by Mr. R. W. Hibberson of the Ryan, McIntosh Timber Company.

In Quebec and Ontario, timber is cut down to, in some cases, 4″ on the stump for pulp making, and in this connection, it may interest you to know that last year some of the paper mills of the United States sent crews of loggers into the remote sections of Ontario and Quebec, where the freight alone on cord wood amounted to $16.00 and over per cord. Last year the United States pulp and paper mills used over five and one-half million cords of wood. This means a solid pile of wood four feet high, four feet wide, nine thousand miles long; and bear in mind, this amount is used every year, and the amount is constantly increasing.

In British Columbia, in the Coast District, we waste most of our small timber. Hemlock 12 to 20 inches on the stump is not considered to be worth logging. In almost any logging operations on the Coast, you will see the small Hemlock left on the ground; literally on the ground; for the high lead method of logging breaks down practically all the small timber on the tract, and when the operation is completed it reminds one of a scene in a Belgian forest, after it had been devastated by the Hun.

The average Timber License on the Coast, carries approximately twelve million feet of timber; the average amount logged off a Timber License during the past fifteen years is five million feet. Government Licenses have logged as high as eighteen million feet, but a great many have only yielded three and four million feet.

Only the timber on the lower elevations has been logged off, the balance being left a prey to fire and wind storms, which every year claims millions of feet. What is the remedy for this? We cannot force the logger to take off this timber, if by doing so, he cannot make a profit. The average consumer of lumber says he cannot afford to pay fancy prices for lumber in order that the timber can be protected and logged clean. But what will be the ultimate result, if we do not stop this waste? Our virgin timber gone, all our wood working plants, or the majority of them, will be forced to close, and as lumbering is the chief industry of British Columbia, we shall suffer a great loss.

1920 figures give lumbering production as 92 millions of dollars.

1919 figures give lumbering production as 70 millions of dollars, one-third as much again as mining and fishing combined, which only total 48 millions. There are many other industries dependent on the lumber industry. Our wire rope plants, iron works, food supply houses and farmers, will all feel the loss. Our salmon canneries, mines and railroads are large consumers of lumber and will keenly feel the loss of our timber, which will increase their operating expenses enormously.

I have no doubt that you think I am painting a very harrowing picture, and one that can never come about, but it has come about in other parts of this Continent, and will certainly come about here, unless we can take measures to prevent it. The fact that we can ship lumber across this Continent by rail into New York State, to keep the wood using plants there alive, proves it. New York State once was heavily forested, like British Columbia. Her requirements today are 300 board feet per capita. She can only get from her forests 30 feet per capita; the balance of 10 p. c. she must import from Canada, the Pacific Coast and the Southern States.

Less than 5 p. c. of the original forest of the New England States remain. The original Pine forests of Michigan, Minnesota, and Wisconsin, estimated to contain 350 billion feet, talked of as inexhaustible, are now reduced to six billion feet. These densely populated States are now dependent on timber grown and manufactured elsewhere; and in a very few years will be absolutely dependent on Pacific Coast timber.

The bulk of the timber used in the Eastern and Central States during the past fifteen years was grown in the Pine forests of the South, but these forests have been so heavily cropped that they have now been reduced from 650 billion board feet to 150 billion board feet. Much of this is small timber on cut over land; and within seven years, these States will cease to be a factor to reckon with the export business, for they will require their timber for their own domestic use.

At the last meeting of the Southern Pine Association, it was estimated that 80 p. c. of their mills will close within seven years, not having any further supply of timber for their use. This means that British Columbia and the Pacific States of the United States will have to supply the wants of the United States market and the Prairie Provinces of Canada in addition to filling the wants of the export trade, with Europe, Australia, South Africa, the Orient and South America.

Mr. A. L. Clear, President of the Vancouver Lumber Co., some time ago had courage enough to state that we had not nearly the amount of timber in British Columbia that we were credited with. He estimated our resources at approximately 150 billion feet. Dr. Judson Clark, a well known authority on timber in British Columbia estimates the total stand of accessible merchantable timber to be approximately 100 BILLION FEET. Personally, from seventeen years observation and examination of the timber in British Columbia by our firm, I incline to the figures as given by Dr. Clark.

British Columbia has an area of 359 thousand square miles, of which only forty thousand miles is commercially forested. 110 thousand square miles of our timber lands containing 665 billions of feet has been totally destroyed and as the humus has been burnt it will be centuries before it is again covered with a forest growth. The Slocan and Southern boundary countries of British Columbia have been so burnt over, that many of the mines and mining towns have to ship their mining timber and fuel by rail, distances up to seventy miles, and this country a few years ago was heavily forested.

OF THE FORTY THOUSAND SQUARE MILES OF COMMERCIAL FOREST IN BRITISH COLUMBIA, ONLY 50 p. c. CAN BE SERIOUSLY CONSIDERED AS CONTAINING ACCESSIBLE LOGGABLE, TIMBER; the balance being on rocky steep ground, where the cost of logging and the breakage would be so great that it would not tempt a logger to operate for many years to come.

The Virgin growth of timber in British Columbia is steadily decaying and should be cut and marketed, but the young second growth on which we depend for our future supply of lumber should be jealously preserved. At present we are recklessly cutting it for tie timber, poles and mining timber, destroying fully 30 p. c. of it during the operation. It is common practice to leave 20 to 40 feet of good sound butt logs in the woods, because it is too large to hew into ties. The same condition applies to operations where mining timber is being logged. This should be checked, and without waste of time. Depletion of our forests in British Columbia within 20 years with a resultant slump in all enterprise

that depends wholly or in part on Forest Products can only be averted if action is taken without further delay.

The action we would propose is, that private timber land owners adopt logging methods that will protect and preserve young growth, and leave logged off lands in condition for forest renewal, then the young trees of today will be of merchantable size when needed. This is dependent on keeping fires out of the forests, so that young trees will have an opportunity to grow.

It has been shown, on examination, that unless logging slash is burnt over, the reproduction is very poor, the heavy slash shading the young seedlings. It is necessary for a fire to follow logging operations in order to prepare the ground for seeding. This should be undertaken by the Government, who can take every precaution to avoid disastrous fires.

It takes approximately 80 years to produce trees of commercial size, that will make ties and piling for the Coast, or saw logs for interior mills. Eventually our coast mills will have to adapt their cutting machinery for small logs, for the Virgin timber, once gone, can never be replaced. It takes from 200 to 400 years to produce our large Fir timber, and double that to produce our big Cedar. The fortunate owner of a tract of Virgin Cedar and Fir, will, if only he can afford to hold it for a few years, reap a rich reward.

The relationship of timbered areas to future needs, their incentive to tourist travel; the fact that they serve as water reservoirs, etc., make the public vitally interested in seeing them continued. The reforestation of logged off areas, unfit for agriculture, in the interior of British Columbia and portions of the Coast District, and protection of such areas against fire, is proposed as the solution of the continued timber supply problem. Depletion of our forests has not resulted from the use of the forests, but from their devastation, from our failure while drawing upon our reservoirs of Virgin timber, to also use our timber growing land.

The reforestation will have to be undertaken in the main, by the Government. It is not practicable to enforce the practice of forestry on private timber lands, for the growing of timber of saw log size is an operation too long in time and offering too low a rate of return to attract private capital, always excepting Pulp and Paper Companies, who can use timber long before it becomes saw log size. (In this connection, Pennsylvania planted nine million trees in 1919; fifty million trees since 1900.)

Very shortly we shall see a large increase in the number of these plants, and it is to be hoped that Canadian and Empire capital will be behind them.

In conclusion let me say that it is vitally necessary that newspaper publishers within the Empire, should get together and acquire supplies of timber against the time when they will be worrying not about the price of timber but about the fact that they cannot get supplies at any price.

The heart of the dense forest above Moose Head Lake, Maine, is to be penetrated by a railroad built by the Great Northern Company from Seboomook to St. John Pond, eighteen miles north. The line is to be of regulation broad guage and it will facilitate the getting out of lumber in the St. John River headwaters region which ordinarily would be floated down the river. In addition to the main line there will be numerous branches from one to three miles in length and it is understood that the company plans the extension of the main line to the Canadian border eventually.

WON'T BELIEVE IT TILL BURNED.

In a series of public addresses given before such bodies as the Empire Club of Toronto, Mr. Robson Black, Secretary of the Canadian Forrestry Association, has been setting right many popular misconceptions concerning the forestry situation in this country. One such reference was made during an address at the King Edward Hotel, Toronto, before a large luncheon assembly of business and professional men, when Mr. Black asked and answered the question: "What remedies for forest depletion are being applied?"

"The pulp and paper companies of Canada have openly and sincerely committed themselves to the principle of 'sustained forest yield.' They have recognized the necessity of 'anchoring' the forest as rigidly as they have anchored their mill dams. Fifteen companies have established forestry branches within four years. Several are replanting millions of trees on barren areas. The pulp and paper industry is as diligently in search as any Canadian Government for a workable scheme by which each square mile of timber shall be operated as a self-productive forest crop.

"The moment the business and professional men of Ontario ,and the farmers and labor men who have most to lose, plainly say that the forest resources belong as much to the people of 1998 as to the people of 1921, when they say that our timberlands are a rich treasure-house that devastation must not touch, the job of conservation is an accomplished fact. Just now the weakness is that not sufficient Ontario men believe that thing with the usual Ontario tenacity, and are willing to say it out loud."

Mr. Black countered the common view regarding reforestation by stating that the major undertaking in Ontario is not to plant trees by human hands, but to take the utmost advantage of the hundred of millions of infant trees scattered through our forests by natural processes. The main job of replanting Ontario's cut-over lands will be done by Mother Nature herself, although in many locations she has already refused to do her part in face of violations of almost every engineering and biological law.

"Before the term 'forest conservation' can become much more than an amiable password, we must elevate the forest resources into the very front rank of public policies, and take on the job associated with their management as a first concern in our national economy. I speak of the forest areas of Ontario, not as the private business of the limit holder, but as a public asset of incredible richness vested to the extent of 90 per cent. in the name of the people of Ontario. It is true that we have alienated, or rather leased (mostly for a useful purpose), much of the timber growing thereon, but by the retention of the land title, we cannot alienate the responsibility of the whole people as chief conservator."

Happiness is the only good. The way to be happy is to make others happy. Other things being equal, that man is happiest who is nearest just—who is truthful, merciful, and intelligent—in other words, the one who lives in accordance with the conditions in life. — Robert Ingersoll.

The Russell & Pettengill Company are now in their own building at 1700 Prairie Ave., Chicago. They are industrious Industrial Engineers.

News From Europe

Growth of Finnish Industry.

According to statistics complied by the Norwegian journal, "Teknisk Ukeblad," the industries of Finland seem to be entering upon a new era of prosperity. The textile industry comes first, and then the paper industry; in 1920 the total valuation of paper and pulp produced amounted to 395·5 million marks, out of a gross income of 2,365,157,000 marks. In 1913 the valuation of the raw and half-stuff was 214,318,100 marks. A curious feature of these statistics is that, whereas the number of mills has increased, the number of the workmen employed has diminished.—Teknisk Ukeblad, January 21, 1921.

The German Wall Paper Industry.

In common with other sections of the paper industry, the manufacture of wall paper has met with several set-backs due to various factors, the most serious of which is the shortage of raw materials. The difficulties of obtaining coal are such that even members of the trade, who are not mill owners, have only an inadequate notion of the gravity of the situation. The shortage of coal is serious, but it is not generally known that many of the mills have been driven to round-about ways of securing a supply of firing materials. Fuel of every description, often of the rubbish variety, is being tried, whether peat, pyrites, coke, lignite, briquettes—everything but genuine coal. The extraordinary difficulty of maintaining steam pressure with such low grade fuel is obvious enough, and in the case of a wall paper mill is intensified by its extra steam requirements.

Another factor is the reduced manufacture of paper, which is not received regularly, despite the fact that it is about forty times above the pre-war price, for the paper mills are also short of raw materials, particularly Russian rosin, which is much superior to the Swedish article. In addition the manufacture of dye-stuffs for paper presents the greatest difficulty. Consequently when the dealer examines the stock of a wall paper mill, he will find pulps, but not those which are in current demand. Stocks are also reduced to the point of what is absolutely needed, for otherwise capital for operation would be wholly insufficient.

A third factor is the shortage of size. It is well known that the wall paper manufacturer has fallen back on vegetable size, which before the war cost 18-20 marks per 100 kilos. or 220 pounds. Today the price is 750 marks, excluding freight, and even then the supply is insufficient, so that it must be supplemented by a good deal of substitute material. When wall paper is sized with this the customer complains of the poor quality, although the maker is not in a position to improve it.

With regard to operation, high wages and the absence of skilled hands are the chief obstacles. If orders do not come in, the number of workmen must be reduced, and unemployment is one of the chief cares of the paper maker. Dealers point out the possibility of export business. But export trade may be summed up in a few words; large orders are wanting. The circumstance **that exports would permit of selling goods on the home market below the cost of production no longer exists.** But, if such were really the case, how could manufacture proceed? With prices reduced by 30 per cent, but wages, raw materials, vegetable size, freights, all higher than in March, when a 60 per cent rise took place? An exception is afforded by paper, but its price is already beginning to harden again. The outlook is certainly not rosy. New designs are suggested, but the position of the designer is gloomy. The demand for patterns is lacking. It is better to give up the manufacture of designs, since rolls have become so expensive that the maker, although he exhibits only a fifth part of the patterns formerly shown, must spend more than ten times their value. At present the cost of patterns and rolls amounts to as much as the entire turnover before the war.—Tapeten-Zeitung, February 1, 1921.

Problems of Fuel Economy in Germany.

There are many signs that Germany is solving the fuel problem, and though the process is necessarily a slow one, and requires much time before it can be brought to perfection or even moderate success, it is having an influence on the paper industry. Granting that fuel must be provided in greater abundance, for without an adequate supply, paper making cannot flourish or exist on a modern scale, it is becoming evident that the Germans, with the assistance of the Scandinavians, have tackled the technical problems with results of two kinds. They have reduced the expense ratio in fuel consumption and operation, and raised the caloric values. According to the study of this subject by the Swedish engineer, A. Hallbach, these results have been effected through the organization of Fuel Administration "genannt Warmestelle." It is an association of 266 companies with its main office at Dusseldorf. It is reported in Stahl und Eisen of December, 1920, that branches have been formed in Karlsruhe and Kattowitz. The experimental and technical work, as well as the business of organization, is performed by 200 officials or experts. The problems which so far have been solved more or less completely are the economy and production of lime, lubricating oils, graphite, calcium carbide, lyes and fuel. Without doubt the scheme will eventually secure a certain amount of stability and operating efficiency in all the mills, unless some untoward event should interrupt it.—Teknisk Tidskrift, January 29, 1921.

Paper Mill in Argentina.

The "Industria della Carta" gives an account of the new paper mill at Barrangueras, which it describes as the "first to be in operation" in the Republic. It has a capacity of 300 quintals of wood pulp a day. The native grass, called "paja brava," is used for the manufacture of strawboards. The fibers are long and of great strength or toughness, and the weed is so plentiful that there is no danger of a shortage of raw material.—Industria della Carta, January 31, 1921.

Norway Exports and Imports News Print.

The Bulletin of Foreign Commerce of Christiania states that exports of print papers of all grades in November were 8,441,287 kilograms, of which 6,636,044 kilograms comprised news print in rolls. In the same month imports of print papers amounted to 26,806 kilograms.—Manedsopgaver over Vareomsetningen, 1921.

A Chinese trust controls the dye used on fire crackers, made from cibucao, a Philipine wood. The same dye is used for sealing wax and Chinese ink.

PULP AND PAPER NEWS

William Snaith has resigned as chief draughtsman of the Riordon Co., Limited, Mattawa, Ont., and has moved to Chicago to accept a position on the technical staff of the Forest Products Engineering Corporation.

According to W. L. Bird, manager of the Fort William Pulp and Paper Company, Limited, pulp will be shipped from the new plant at Fort William by the end of the present month. The contractors, Barnett & McQueen Co. have finished their work a month ahead of schedule and considerable machinery and equipment have already been installed.

The Fletcher Lumber Company, Limited, has been granted Ontario incorporation with head office at Windsor, Ont., and a capital stock of $100,000. The company is authorized to deal in a general lumber, timber and pulpwood business and the provisional directors are J. A. Fletcher, J. F. Twigg, W. M. Wright and A. A. Mackinnon.

With power, among other things, to engage in business as stationers, printers, lithographers, etc., the Federal Advertising Act, with head office at London, Ont. The capital stock is $50,000.

In Toronto last week the Spanish River Pulp and Paper Mills, Limited, filed a statement of claim in their suit against Hon. W. R. Riddell and Hon. F. R. Latchford, commissioners conducting the timber probe. The company say they are always willing to produce documents relevant to he application concerning the right to cut timber on certain areas, but they ask declaration that the commissioners are purporting to act without proper authority in demanding the list of documents for which they ask, and that the order-in-council creating the timber commission is ultra vires.

Former Provincial Treasurer T. W. McGarry left Toronto lasta week on a hurried trip to British Columbia where he is president of one of that province's big paper producing companies, the Whalen Pulp and Paper Mills. It is stated that his visit to the western province has to do with a big pulp merger that is being negotiated.

Due to the large amount of manufactured product on hand and the prospect of a limited market, the Hydro-electric pulp mill at Campbellford, Ont., has closed down for an indefinite period, according to a despatch from Peterborough.

Twenty-two men of the Mounted Police are still on duty at the Beaver Board mill at Thorold, where a strike is in progress. Seven of the strikers are out on bail under charge of using insulting language to some men who were leaving the plant. The union has retained a Niagara Falls lawyer to defend the men. Ever since the strike started several weeks ago the strikers have picketed the road in front of the Beaverboard plant, but there has been no violence.

Col. Jones, general manager of the Spanish River Pulp and Paper Mills, Limited, and A. J. Gaudette, in charge of the order department of the company, were in Toronto for a few days last week.

The pulp and paper industry will learn with regret that Mr. Joseph N. T. Tallman, President of the Tallman Brass and Metal, Limited, died last month in Hamilton, Ont. He was in his seventy-fourth year.

The Prince Rupert Pulp and Paper Company, recently incorporated in British Columbia, is asking industrial privileges at Seal Cove within the city limits. The company will erect a sulphite mill with a capacity of fifty tons of pulp. It will operate in conjunction with the Emerson sawmill, and the intention is to later build a large paper mill.

Twenty-five thousand dollars has been loaned to the Douglas Fir Turpentine Company, Vancouver, by the provincial government as an aid to establishment. The company, which will engage in the extraction of turpentine from the Douglas fir, has a plant in operation on False Creek, and has completed extensive and successful experiments in tapping the trees.

DISPLAY OF CANADIAN PAPETERIES.

The rather remarkable development of papeterie manufacture in Canada is demonstrated by the opening of holiday stationery at the plant of Warwick Brothers & Rutter, King Street, Toronto. The papeterie department of the company is the special care of the General Manager, Mr. H. C. Woods, who this year has evolved several new and very artistic lines which are attractively displayed in a specially constructed show room at the plant. In design, quality of stock and richness of finish of both the specially milled paper and ornamentation of the boxes, the display of Made in Canada stationery this year is the last word in the creation of fancy holiday goods. A particularly attractive line is Rose Petal which is of the highest grade of No. 1 linen finish paper obtainable. Collington Cloth is another new line, with correspondence cards in harmony with the note paper and envelopes, done in colors with delicate white border. There is also the Persian Creton line of the highest grade kid finish, the boxes being lined with richly colored creton. This variety includes a desk pad with creton trimming to match the boxes. An artistic line of Gentlemen's Club stationery is also shown, while the company's standard lines completes the display. Mr. Woods is justly proud of his creations and reports that orders and enquiries have already justified this further artistic elevation of papeterie manufacture.

The real leader in industry today is not the man who substitutes his own will and his own brain for the will and intelligence of the crowd, but the one who releases the energies within the crowd so that the will of the crowd can be expressed. — Charles M. Schwab.

A man who is never ready to start cannot hope to be "in at the finish."

Technical Section

REVIEW OF RECENT LITERATURE.

A-1; K-0. Use of Southern woods for pulp and paper manufacture. Paper, 23, (Sept. 8, 1920). The South (of the U.S.) has large stands of various species of pines. These contain too much pitch to be successfully reduced by either the sulfite or groundwood processes; they can be reduced by the sulfate or soda processes, preferably the former. The Southern hardwoods (various species of gum wood, cotton wood, sycamore, bass wood, magnolia, willow, etc.) are short fibered and can be most satisfactorily reduced by the soda and sulfate processes. It is not economical under present conditions in the U. S. to pulp plants such as sugar cane bagasse, corn stalks, cotton stalks, various straws, etc., as they offer the following difficulties in handling: they usually contain a large percentage of pitch giving pulps low in fiber content and requiring high chem. consumption; material of this type represents seasonal crops, so that facilities must be provided for the storage of a large vol. of the stock in order to permit the paper mill to operate throughout the year; the susceptibility of such material to decay adds greatly to the costs and difficulties of storage; due to the bulkiness of these materials, the digester charge is reduced, thereby reducing the yield and increasing overhead costs proportionately. Straws are being pulped; but for use in the manuf. of corrugated board and cheaper board products and not as a substitute for refined pulp such as sulfite or rag stock.—A.P.-C.

A-3; K-0. The manufacture of paper from Florida saw-grass. Paper, 20, (Sept. 15, 1920). See also Pulp & Paper, **18,** 904, (Aug. 26, 1920). As a result of expts. made with Florida saw-grass as a papermaking material, 2 companies are reported as having been organized for the manuf. of paper from this material.—A.P.-C.

A-4. Micrography of sycamore pulp. L. VIDAL. Papeterie, **42,** 434-9, (May 25, 1920); Paper, 18-9, (Sept. 22, 1920). Translation by A. Papineau-Couture, See Pulp & Paper, **18,** 1004, A-4, (Sept. 23, 1920).—A.P.-C.

A-3. Possibilities of new fibers for pulp and paper making. ALBERT JANVIER, Technical Director. Papeteries de l'Indo-Chine. Paper 11-2, 32, (July 28, 1920). A discussion of the value of various plants and grasses, principally bamboo, for the production of grasses, principally bamboo,for the production of paper. Translation of art. in Papeterie, **41,** 482-6, Nov. 10, 1919. Director of the French School of Papermaking, Grenoble; but the original article is signed by Albert Janvier. Abstractor's Note.)—A.P.-C.

A-3. The papermaking quality of bagasse. F. HEIM, J. MAHEU, and L. MATROD, Laboratoire Général des Productions Coloniales. Papeterie, **42,** 539-43, (June 25, 1920); 578-87, (July 10, 1920). A detailed chem., microchem., and micrographic study of bagasse and of the pulp obtained therefrom, from the point of view of its suitability for the manuf. of paper. It can furnish a fairly satisfactory material of medium quality provided the sugar factories are supplied with an equivalent amt. of fuel.—A.P.-C.

A-3. Suitability of bagasse as a source of paper. F. HEIM, J. MAHEU, L. MATROD. Papeterie, **42,** 539-43, (June 25, 1920), 578-87, (July 10, 1920); Paper, 11-4, 36, (Sept. 15, 1920). Translation by A. Papineau-Couture.—A.P.-C.

A-14. Testing lime and cement bag paper. PAUL HOUSTAN. Pulp & Paper, **18,** 947-8, (Sept. 9, 1920); Paper, 15-6, (Sept. 22, 1920). An investigation of lime and cement bag paper undertaken by the U. S. Bur. of Standards showed that a lab. test should be developed that would give numerically the stress and strain that the paper of the bag underwent in service the stress-strain or resiliency test was developed. A brass cylinder was constructed and fastened to the upright standard of a 200 kg. Schopper tensile strength machine in such way that it would revolve. The revolution of this cylinder was so controlled by a small wire over a pulley from the weighted pendulum that as the pendulum moved from its vert. position due to the increasing loads, the cylinder revolved accordingly. This cylinder held a paper chart, and a glass recording pen was used to record both load and stretch. The pen was controlled by a small wire extending from the lower jawed arm over a pulley in such a way that as the lower jaw descended and the paper stretched under the load, the pen ascended and described a curve which registered stretch. The revolution of the cylinder caused the registering of load on the chart, while the ascension of the pen caused the registering of stretch. The result was a curve giving both increasing load and increasing stretch. The result was a curve giving both increasing load and increasing stretch until the paper broke. The carrying out of the test is described in detail. The conclusions reached by the Paper Section from this investigation were that this resiliency test was the best known test for showing what the paper would do in actual service.—A.P.-C.

A-11; K-9. Microscopic examination of China clay. Pulp & Paper, **18,** 894, (Aug. 26, 1920); Paper, 18, 32, (Sept. 15, 1920). The refractive index of the mineral is about as follows for lights of diff. refrangibility: red 1.562, yellow 1.563, green 1.571, blue 1.582. These figs. were obtained by mixing oils of cassia and cloves till the mineral showed the Becke effect, when immersed therein, alternately higher and lower after rotation through 90°, the polarizer being in the axis of the instrument. The refractive index of the oil in the particular light was then detd. on the refractometer. There may be an error of one or two units in the 3rd decimals, especially at the ends of the spectrum. Kaolinite (contained in China clay) undergoes a curious change by grinding: the refractive index falls from about 1.563 to about 1.52 for D light. This lowering of the refractive index is not due to the minuteness of the particles. So obstinately does the clay adhere to paper fiber that it cannot be washed out after teasing in water. After boiling in KOH soln. a rough sepn. of the greater part of the fiber can be effected by teasing. The KOH probably removes some of the size used in the prepn. of the paper and cleans the surface of the particles of clay.—A.P.-C.

A-14. Testing tar roofing board. Paper, 18, (Sept.

8, 1920). Translation of original in Papier, **22**, 149, (1919). See Pulp & Paper, **17**, 582, A-14, July 17, 1919. ——A.P.-C.

A-14; K-20. The composition of parchment paper. Paper Makers' Monthly; Paper, 17, 25, (Sept. 29, 1920). The moisture varies from 5-14% but is usually abt. 7-8%. The ash does not usually exceed 5% but extremes of 0.2% and 15% sometimes occur, but very rarely. The water-sol. content ($CaCl_2$, $MgCl_2$, sugar, glycerine, etc.) varies from 0.1-30% average abt. 10%; they are added to keep the paper flexible. Excessive proportions of sugars tend to produce mould when used for wrapping butter; glycerine does not assist much in the production of mould. If parchment paper is boiled in 2% NaOH, genuine chem. parchment papers remain tough, while imitation parchments are easily disintegrated and fall to pieces when rubbed between the fingers. Herzberg's reagent stains genuine parchment more readily than imitation parchment. The latter contains a larger proportion of rosin. According to Annoni a reddish violet coloration when a sample of the paper is treated with a drop of Ac anhydride followed by an equal vol. of H_2SO_4, indicates the presence of rosin and is a confirmation of any previous proof that the paper is an imitatgion parchment. — A.P.-C.

B-3. Need for prevention of costly forest fires. LOUIS ROTHSCHILD. Paper, 11, 25, (Sept. 29, 1920). According to the Am. Forestry Ass., the annual loss by forest fires in the U.S. is abt. $28,000,000. In view of the ever increasing scarcity and cost of lumber and pulpwood it is imperative that fires be prevented in so far as lies within our power. The effects of repeated fires on a growing forest and on the seed stored in the ground is described at some length showing how they ultimately destroy the stand without giving it any chance to grow up again. The appearance of the forest at the various stages of destruction by forest fires is described. A plea is made for better utilization of farm woodlands.—A.P.-C.

B-4; E-2. Cellulose alcohol in Switzerland. Z. angew. Chem., June 15, 1920; J. Soc. Chem. Ind., **39**, 322R, (Sept. 30, 1920). A society has been formed in Geneva with the object of establishing a cellulose-alcohol ind. in Switzerland. Expts. are now being undertaken on the production of alcohol from sawdust cellulose, those by Terrisse having shown good results. It is thought that the price of such alcohol would be much lower that that from sugar-beats or than that of synthetic alcohol, but it should not exceed 25 centimes per kg., otherwise it could not compete with petrol which now costs 1.10 fr. per kg.—A.P.-C.

B-9. Alaska—"A real solution of the paper shortage." LOUIS ROTHSCHILD. Paper, 9-10, (Sept. 15, 1920). Col. W. B. Greeley, Forester of the U. S. Dept. of Agric. considers Alaska can yield a permanent annual pulpwood supply to yield 1,500,000 t. of paper, estimated to be one-third of the present consumption of the U. S. Before the War economic conditions were such that it was not practical to establish mills in Alaska; but the present shortage and high prices of paper have induced capital to make the venture and at present one mill is being erected at Port Snettisham.—A.P.-C.

B-9. Canadian pulpwood resources. D. M. Le BOURDAIS. Paper, 19, 42, 44, (Sept. 29, 1920). G. C. Piche, Provincial Forester of Que., estimates there are 360,000,000 cords of pulpwood in Que., including spruce, balsam, poplar, and jack pine to 4″ in diam. From these figs., allowing for species other than spruce and balsam, for timber not accessible to existing means of transportation, forthe diam. limit imposed by the provincial timber-cutting regulations, and for various shrinkages between the woods and the mill (unnecessary waste in logging, merchantable timber left uncut and destroyed by pest, etc., loss of logs on driving, etc.), the Can. Pulp & Paper Ass. estimate Que. has 155,000,000 cords avail. for newsprint manuf. At the 1918 rate of cutting (nearly 3,000,000 cords) the duration of Quebec's pulpwood resources, exclusive of annual growth, is estimated at 52 yrs. Similarly, it is estimated Ont. has 250,000,000 cords, of which 100,000,000 are avail., and 138,000,000 would be avail. if the T. & N. O. Ry. were extended from Cochrane to James Bay. At the 1918 rate of cutting (1,116,000 cords) the duration of its pulpwood resources, exclusive of annual growth, will be 90 yrs. It is estimated that a a rate of cutting equal to that of 1918 (987,000 cords) the forests of N.B. will last 26 yrs., and that the rate of cutting is greater than annual growth. In N. S., on the basis of the av. cut for 1917 and 1918, the supply is adequate for 85 yrs. The Prairie Provs. are estimated to contain 400,000,000 cords of pulpwood, 125,000,000 being estimated to be spruce and balsam: 25,000,000 are at present accessible to existing transportation systems. The B.C. supply of pulpwood is estimated at 179 billion board feet. The 1917 cut was 134,814 cords, at which rate its pulpwood resources may be said to be next to inexhaustible. But with the present world-demand it is quite probable that the time is not far distant when it will have to face the possibility of rapidly diminishing forest reserves.—A.P.-C.

D-4. Increasing grinder production. W. A. MUNRO. Paper, 15, (Sept. 15, 1920). Description of a doctor to prevent the stock which follows the stone from coming out of the pocket and making the wood pinch or bind.—A.P.-C.

E-5; F-5 The Allen automatic control for cooking chemical pulp. C. H. ALLEN. Paper, 21-2, (Sept. 15, 1920): Pulp & Paper, **18**, 1041-2, (Oct. 7, 1920). Sulfite pulp should be cooked automatically for 3 principal reasons: 1) increased production; 2) improved quality; 3) more uniform steam load on the boiler house. The automatic cooking control consists essentially of a power driven steam valve electrically connected to a steam flow meter on the digester steam line, an automatic relief valve, and relief strainers that do not plug. It also includes the automatic sepa. of relief gas and liquor. The steam app. can be set to maintain any constant or varying steam flow curve. Temps, within the digester are proportional to the rate of steam input. The control app. therefore can be set to give any desired temp. curve. Changes in the steam flow curve are very readily and quickly made. The steam curve element of the control system is a small thin plate of Cu having an insulated hole, and is slipped over the chart spindle of the steam flow meter clock. The periphery of this piece of Cu at any point represents the rate of steam it is desired to carry at that particular instant. The steam curve and paper chart of the instrument are rotated by the meter clock. The disadvantages of irregular steam flow and the impossibility of obtaining regular steam flow with hand control or other regulators now on the market are shown. Steam flow charts are given for 3 cooks each by hand control, by a "well-known regulator," and by the Allen control.—A.P.-C.

UNITED STATES NOTES

The period of wage re-adjustment which is now in full swing through the country over, affecting the workers in practically all industrial lines, has hit the paper trade and allied industries, according to reports from leading centers. In Lawrence, Mass., most of the departments of the Merrimac Paper Mills have been shut down indefinitely as a result of a strike of employes who refuse to accept a 20 p.c. cut in wages. About 250 are affected. At Holyoke, Mass., a revised wage scale averaging 10 per cent went into effect March 14. This reduction affects all paper makers and the allied crafts in the city, except the employes of the Crocker-McElwain and Chemical paper companies The latter accepted individual contracts offered them by their employers some weeks ago, consequently they did not come in for the general reduction. The cuts in Holyoke mean an 8 cent an hour decrease for the skilled help, 11 cents an hour less for the unskilled labor, and a cut of six cents an hour in the pay of female workers. The employees of the Harmon Paper Company, Brownville, Northern New York, accepted what virtually amounts to a 20 per cent wage reduction when they returned to work last week, following a shutdown which began several weeks ago when they quit because of the withdrawal by the company of a 20 per cent bonus.

There has been a growing feeling that strikes may be expected by May 1 in Northern New York mills governed by agreements, such as St. Regis Paper Company, De Grasse Paper Company, Hanna Paper Corporation, International Paper Company and Sherman Paper Company. The action of the workers in the Harmon Company mills accepting the bonus withdrawal lends strength to the feeling that, after all, the workmen may see that the companies would not be strictly averse to a shut down, and that the times make wage reduction imperative. If this view is generally taken, it is believed that possible strikes, growing out of failures on wage re-adjustments, may be avoided.

A further reduction in newsprint prices is announced by the International Paper Company. Quotations for newsprint in carload lots for delivery during the second quarter of the year are reduced by the revision from 5.7 cents a pound to 5.5 cents a pound.

Improvements and enlargements, costing approximately $75,000, have just been completed at the plant of the Filer Fiber Company, Manistee, Mich.

A new mill to be operated at Commerce, Texas, by the Trinity Paper Mills Co., of Dallas, Tex., will begin about April 1, turning out paper pulp made from cotton linters. The plant will have a capacity of twenty tons of paper per day. While this will be all shipped to eastern markets for a time, company officials say they will be able after some months to turn paper out as a finished product from the Dallas plant, which will specialize in the manufacture of writing, tissue, blotting, book and newsprint paper. The new enterprises will give employment to several hundred unskilled laborers in addition to those now working in the Dallas mill.

The eighth annual banquet of the National Association of Waste Material Dealers, held last week in the Hotel Astor, New York, brought together over 300 representative waste material men, some of whom came from remote parts of the country to attend. A review of the organization's activities during the year, as reported by the officers, indicate that large gains were made in membership and that the outlook for the association's continued expansion is most promising. Frank C. Overton, of Castle, Gottheil and Overton, was elected president for the ensuing year.

The Federal Trade Commission, in a report submitted to the Department of Justice, following a long investigation of the stationers' trade, recommends that charges of operating a trust be brought against the Chicago Stationers' Association, the National Association of Stationers and all affiliated bodies. Action by the department on the commission's recommendations will probably not be taken until the conclusion of the Hardwood Lumber Association case which is now before the Supreme Court.

"The Color Grammar,"—considered by craftsmen in the paper and allied trades to be as essential to the art of printing and paper making as the grammar and dictionary are to the English language—was explained in detail at the recent annual meeting of the Strathmore Mill and Merchans' Association at Springfield, Mass. C. W. Deardon, Strathmore's advertising Manager, told of the three years' effort to produce the "Color Grammar" and the many discouragements encountered by those interested in the work. The copies produced represented an outlay of nearly $100,000, and the men engaged in the research gave their time declining any compensation for their services. Each considered it a part of his life's work and a contribution for the future benefit of the printing and paper industries. The men responsible for the success of the work were: H. A. Moses, president, Strathmore Company; H. H. Munsell, who perfected the Munsell system of color; Arthur S. Allen, of Philip Ruxton, Inc.; Rudolph Ruzicka; E. P. Kendrick of Redfield-Kendrick-Odell, Inc.; T. M. Clelland and C. W. Deardon. The work, it was pointed out, is intended as a training for color perception and the quickening of the instinct for color, thus avoiding to a large degree the outrages upon color harmony which are constantly being committed in every day practice.

Manufacturers of gummed paper have been sent invitations to attend at a luncheon to be given April 13, at the Waldorf Astoria Hotel, New York, for a general discussion of the conditions and developments in the gummed paper field. The main object of the meeting, it is announced, is the formation of an organization of gummed paper makers which will probably be known as the Gummed Paper Manufacturers' Association.

The first of a series of bills affecting water-power rights in New York State was introduced at Albany last week. The measure places water power companies under the jurisdiction of the State Public Service Commission, with conditions, obligations and power similar to those which regulate gas, electric and steam companies. The power of the Conservation Commission to approve of new sources of water-supply are transferred so that the regulation of rates and the regulation of source are placed under the same body.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, March 19.—The chief feature of the pulp and paper trade this week was the announcement by the George H. Mead Company, selling agents for Spanish River and Abitibi, of their new newsprint price for the second quarter of 1921, which is 5½ cents in the United States, where the bulk of the output of the two companies is sold. This is the same price that was announced a few days ago by the International Paper Company, the largest producer of newsprint in the United States. It was stated at the Toronto office of the George H. Mead Company that it was presumed that the Canadian price would be the same, although the Abitibi Company deals directly with Canadian publishers, and the Spanish River Company will likely adopt that policy after the end of the present month. The new price compares with 6½ cents charged for the present quarter. The Canadian Export Paper Company, which markets the exportable output of most of the other Canadian mills, announced the 5½ cents rate for the second quarter some weeks ago, while J. R. Booth, Ottawa, has announced a 5-cent rate. The newsprint market is somewhat dull as compared with the brisk period of a few months ago and several of the mills are running on shorter time. However, the output is being fairly readily disposed of, although pulp stocks are piling up in consequence of a dull market.

BUSINESS PICKING UP.—In paper trade circles generally there has been a decided improvement in most lines during the past week. Jobbers report that while big orders are still unknown the smaller orders are increasing in quantity with the result that a fair volume of business is being done. There is an optimistic feeling in the trade and it is believed that the buying era is gradually returning. Considerable paper is being turned over and stocks in the warehouses are slowly being reduced both by purchases from the mills and by a system of inter-buying between the jobbing houses. While there has been some improvement in trade conditions the paper business is by no means down to a stable basis as yet and there is a feeling that the mills will yet have to make further price recessions before a satisfactory market level and stabilized conditions are reached. One jobber, who is a manufacturer as well, criticised the policy of making so many bites of a cherry in getting the prices down to rock bottom and declared that the sooner the mills rearranged their prices on a basis of a closely figured cost and profit the better it would be for the paper trade all round.

PULP.—The continued declining market has caused great timidity among buyers of both pulp and paper, and it is the opinion of those in the trade that this timidity will continue till the price is stabilized and the buyers are sure the bottom has been reached. Although buyers agree that prices of some lines approach costs, they feel that present costs are not indicative of the price level where prices will stabilize, for costs, they point out, are bound to decline and the prices cannot stabilize until they reach a level which is based on costs several months in advance. Recovery of business, it is conceded, is going to be slow. At the present time very little business is being done in pulp in Canada. From January until the present time ground wood has gone down from $65 to $50 per ton and occasional lots have been sold slightly below that figure. The decline in newsprint production affects news grade sulphite as well as ground wood, although the effect will not be quite so far reaching as the over-production is not as great, and the low prices will, to a large extent, shut off imports. Bleached sulphite is now practically uniform at 6½ cents f.o.b. mill. A small foreign tonnage is being offered in the United States as well as some from the domestic mills. The demand in Canada is practically nil so the lower prices do not arouse much interest. The contract price for soda pulp has declined from 8c to 6c and mills that have been using pulp for the finer grades of paper are now finding it cheaper to use waste paper. They will likely continue to use it as long as they can get paper stock at $40 a ton. One prominent man in the paper trade remarked to the "Pulp and Paper Magazine" that pulp and paper manufacturers need never again look for the artificial conditions that obtained during the years of the boom period and the quicker that was realized the better. He urged that pulp sales and manufacture should be gotten down to a stable basis so that paper manufacturers could figure out their cost with a fair profit. So far, it seemed to him, only a few of the mills realized that prices should be brought down to a basis of a fair price above solid manufacturing costs, a fact that was hindering the trade from getting back to a stable basis. Other paper dealers expressed the opinion that prices of both pulp and paper were still too high and that all lines would have to come down before a normal state of trade was reached.

PULPWOOD.—Toronto representatives of pulpwood firms report that the demand for pulpwood is very light at the present time and those who have wood to sell are more anxious to get rid of it than to stock up. A year ago when pulpwood was commanding all kinds of prices nearly everybody got into the game and there was an over-production. Then the market prices began to tumble and have been on the down grade ever since. A leading Ontario contractor states that there are virtually no current quotations just now. Nominal prices for wood from points south of North Bay are: rough spruce $11.00 to $11.50 per cord, spruce (peeled) $18; north of North Bay the pulpwood is generally of somewhat better quality than south and, of course, the freight rates are a little higher. The average price for rough spruce is $10.00; peeled spruce $16.00 to $17.00 and poplar $9.00. A number of firms which last year contracted for several thousand cars of pulpwood to be delivered on contract to various mills, have not entered into the purchasing game this year at all, in view of the uncertain outlook and the fluctuating character of the demand. From the east word was recently received that pulpwood is likely to increase in value as the summer months come on but this is regarded in Ontario as more or less of a conjecture, as it is impossible to predict with any assurance just what is likely to happen, so far as the requisitions for mechanical and chemical pulp are concerned. The market has been rather quiet for some weeks.

"It takes less time to prevent an accident than to report one," says the Safety League.

NEW YORK MARKETS.

New York, March 19—(Special Correspondence).—Outshining all other developments in the paper market this week is the readjustment of its contract basis on newsprint by the International Paper Company for the second quarter of the year from 5.70 cents per pound to 5.50 cents f.o.b. mills for newsprint in carload lots. In advising customers of the new price, President Philip T. Dodge of the I. P. stated: "This concession is made in spite of the fact that of all orders signed a large proportion is on the quarterly or 5.70 cents basis. It has been our policy to treat all our customers on precisely the same basis and as many have signed riders under our alternative proposition with fixed price for nine months from April 1st, we hereby extend to such customers the option of having 5.50 cents price apply only to the second calendar quarter, leaving price for the last six months of the year to be determined later according to provisions of contract. We trust that these voluntary concessions made in the interest of uniformity for all customers notwithstanding our continued high costs, will tend to further relieve the present situation in the belief that before the year is half spent there will be a decided movement in business conditions."

It was generally expected in the trade that the leading producer of newsprint would revise its contract basis over the second quarter, this belief being prompted by the steady fall in spot prices on newsprint, which even yet are below the contract basis named by the International and several large Canadian mills. There have been sales of roll news in fair-sized lots for spot delivery down to as low as 4.50 cents per pound at mills, and offerings at 5 cents are freely made. Publishers continue to keep very much out of the open market as buyers, claiming to have present requirements amply covered by contract shipments, and the market consequently is in a dull condition. Whether manufacturers are accepting orders for spot deliveries of newsprint at the low prices named in the trade is questionable, but the fact remains that resale lots have been bought by publishers at 4.50 to 5 cents, while there is a considerable supply of newsprint imported from Europe on the market at these figures.

The Federal Trade Commission reports that during December, Germany shipped 14,000 tons of newsprint to the United States. It was only last Summer that Germany resumed paper exports, and opinion in the trade is that December shipments were extraordinary and cannot be continued.

Prices on several other kinds of paper have receded further during the week. A sharp drop in quotations on tissue paper is reported, and No. 1 white tissue, basis 20x30, is now quoted at $1 and less per ream, while No. 2 white and No. 1 manila, basis 24x36, are priced at around 90 cents a ream. Reports from manufacturing centres say that tissue mills are badly in want of orders and that none of them are operating at anything like full time.

Book papers are slightly lower in price. Offerings of machine finished book down to 8.50 cents per pound for spot delivery have been made by mills, and there have been sales of coated book at as low as 12 cents per pound. The situation in the book paper branch of the market has altered but little, if any. Demand is narrow, few publishers being in the market, excepting for small accounts occasionally, and most mills are operating on materially curtailed schedule.

Sales of No. 1 domestic kraft wrapping at 7.50 cents a pound at mills have been reported, placing prices on wrapping papers on a lower basis. Other grades of wrapping are down in relative proportion, the decline averaging about half a cent per pound. Fine papers are quiet, although in some quarters it is said demand for certain of the low-priced lines of bond and ledger papers has broadened somewhat. Sulphite bonds are quoted down to 12 cents per pound, a fairly good bond being obtainable at that figure today, while one of the most widely known and most extensively advertised watermarked bonds is quoted at around 14 cents, contrasted with a price of above 20 cents when the market was at its peak.

The board situation is marked by dullness. A little better movement of those grades of board used by folding box manufacturers is reported, but the demand on the whole is light, and prices have failed to improve their position. Plain chip board is quoted at around $30 per ton at mills and filled news board at between $32.50 and $35.

GROUND WOOD. — Although ground wood is in a weak market position and prices continue to sag—sales of prime spruce ground wood at $40 per ton this week establishing the market on a lower basis—there is a feeling of optimism among dealers that the situation will recover during the next several months. Members of the trade point out that most grinding mills are operating on curtailed schedule and therefore are not piling up their usual surplus stock of pulp, whereas all reports from grinding sections say that there is very little or no snow in the mountains, thus leading to the belief that the usual drought next summer will be more severe than ordinarily, causing production of ground wood to diminish to a larger extent than normally. There are those consequently who expect prices later in the year to be a good deal higher than now prevail and are not endeavoring to put through sales at present. The market, however, is exceedingly quiet, and about the only business current involves supplies available to buyers at the bottom edge of quotational levels.

CHEMICAL PULP. — The market for chemical wood pulp is in a depressed condition and prices have sunk to new low levels for the present downward movement. Papermakers are buying strictly in hand-to-mouth fashion, limiting orders to pulp directly required, and trade therefore is very spotty and in the aggregate is of light volume. About the most important sale reported this week was one involving several hundred tons of domestic strong unbleached sulphite at a price of $82.50 per ton f.o.b. shipping point. The pulp figuring in the transaction was of high quality and commanded about the best price obtainable for domestic unbleached sulphite at present. News grade sulphite has eased off further. Offerings by sellers at 3.50 to 3.75 cents per pound at pulp mills have met with little response and reporots have been heard, though not confirmed, of purchases at lower figures than these. Domestic kraft pulp is down to 4 cents per pound. Dealers frankly say they are unable to induce consumers to pay higher than 4 cents, and in some cases transactions have been made at further concessions. There is little stirring in the imported pulp trade, and importers are confining their activities almost entirely to purchases at primary sources on direct orders.

RAGS — If there is any improvement in demand



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INQUIRIES SOLICITED

for papermaking rags it is not visible on the surface of the market. Some dealers report mill customers to be evincing more buying interest, but the majority say that they are effecting few sales and that regardless of the efforts put forth they cannot induce paper manufacturers to place orders. Prices have undergone no further broad changes this week, yet the tone continues easy and the probabilities favor buyers getting rags at less than the figures quoted by dealers and packers.

Offerings of No. 1 new white shirt cuttings to mills at 12.50 cents a pound at shipping points have brought out few buyers, while old No. 1 repacked whites have been offered down to 7 cents, with 8 cents asked for the better grades, with buyers showing little interest. Roofing rags are moving in small amounts, but in a fairly steady manner at a price basis of around one cent a pound at shipping points for No. 1 packing. Old thirds and blues are offered at 1.75 to 2 cents for rough packing and between 2.50 and 2.75 cents for repacked stock.

PAPER STOCK. — Only a light movement of old paper into consuming channels is noted, and prices on several grades are on lower levels. Offers of No. 1 hard white shavings to mills at 3.75 cents a pound at shipping points and of No. 1 soft white shavings at 2.75 cents have been recorded while ledgers and writings are available at 2 cents a pound, No. 1 heavy book stock at 1.25 cents, No. 1 old kraft at 1.85 cents and white blank new cuttings at 1.90 cents. Consumers have displayed little desire to buy at these prices, their present policy being to limit purchases to material actually and immediately needed. Folded newspapers rule fairly steady at around 55 cents a hundred pounds f.o.b. New York, and No. 1 mixed paper at 45 cents, but board mills are absorbing such grades in small volume.

OLD ROPE AND BAGGING. — Old rope is moving in scattered directions toward consuming mills and in limited quantities at 4 cents per pound or a shade less at shipping points. Mixed strings also are being bought in small lots by consumers at between 1 and 1.25 cents per pound. Old bagging continues to be neglected, and prices are largely nominal, with offerings of No. 1 scrap bagging reported at 1.25 to 1.50 cents per pound, and of roofing bagging at around 75 cents per hundred pounds.

SHE'S TOO MODEST.

Ebb: "Why don't you wear calico any more?"

Flo: "Oh, I just hate to see myself in print."—The Cornell Widow.

News From Our Advertisers

A Visit to Messrs. C. Walmsley & Co's. Works.

(By our Business Representative in Great Britain.)

I had the pleasure of visiting C. Walmsley & Co's. works, Bury, Lancs., Eng., recently and was received by Mr. Wolstenholme, the Managing Director, and Mr. Adamson, Director and Technical Engineer.

After an interesting chat on the position of the engineering trade for paper manufacture, I was shown over Atlas Works, Charles Street Extensions and Wood Street Works. These works rank amongst the largest engineering works devoted to paper-making machinery in the world, and are equipped with the



MR. JOHN WOLSTENHOLME.

latest plant, both for castings and the manufacture of paper mill machinery.

In the Moulding Department I saw the moulding plant prepared to cast cylinders up to 26 ft. long on face, and of all diameters up to 12 ft., these cylinders being cast of a special mixture of metal, producing a very close grained casting, which takes a wonderfully high polish, and in addition is 50 per cent stronger than cast iron. Also, there is a marked difference in the heat conductivity of this special mixture of metal, this being a pronounced feature for drying cylinders.

The troubles, owing to the moulders' strike of a

Scandinavian American Trading Co.

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Write us when you have any surplus of **Ground Wood** Bleached or Unbleached. We are always in the market.

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Methylene Blue B.B. conc.
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SUBSTANTIVE COLOURS

Paramine Fast Pink B.
Paramine Sky Blue F.F.
Paramine Blue 2B.
Paramine Black B.H.
Paramine Yellow R.
Paramine Brown G. conc.
Paramine Brown M.
Paramine Fast Bordeaux B.
Paramine Green G.
Paramine Violet N.
Paraphenine Yellow G.
Diazamine Fast Yellow H.
Rosophenine 10B.
Benzopurpurine 4B.

Paper Black 3181

ACID COLOURS

Orange II.
Orange IV.
Naphthol Blue Black 10B.
Acid Prune V.
Brilliant Bordeaux B.
Ponceau G. conc.
Ponceau 4R conc.
Croceine Scarlet 5R.
Carmoisine S.
Nigrosine W.S.

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Orders supplied direct from Canadian Stocks. New Products will be added from time to time.

year ago, are now almost forgotten, and as a result of the bonus scheme instituted by this firm, the output of the foundries has been greatly increased.

In the Machine Shops some very fine tools are installed for high-speed manufacture.

One special feature of the works is the wide bays of good height, each provided with electrically driven overhead cranes.

I was fortunate in seeing the last of the material being completed for the two mammoth machines, which are now being erected at the Abitibi Power & Paper Co., Ltd., Iroquois Falls, Ont. The chief troubles experienced in the building of these machines have been the obtaining of material, which Messrs. C. Walmsley & Co., are bound to purchase from outside sources.

During the last three years large extensions have been carried out to relieve the congestion of their main works, and the whole of the cylinder plant will be apart from the main part of the works, and is being speeded up for a greater output of cylinders. The organization of this plant is excellently arranged, and the management are to be congratulated on the systematic method of manufacture. The cylinders pass immediately from one machine to another without a pause.

Besides Fourdrinier Paper Machines, Messrs. Walmsleys are manufacturing Board Machines, M. G. Machines, Super Calenders, Winders, Paper Cutters. Beaters, Breakers, Steam Engine and Mill Gearing, and they have an extensive order list.

Large works like these, however, need plenty of orders to keep them busy, and as pointed out by Mr. Wolstenholme, they are in a splendid position to give quick delivery of machines.

In addition to the works at Bury, they have within the last fifteen months purchased a huge works in Manchester, converting half the works into Moulding Shops and the remainder into Machine Shops, where they are installing new tools. The works are in the centre of a great industrial area, where highly skilled labor can be readily obtained. It has taken some little time to get these works in operation but they hope within a short time to have them up to full capacity.

Messrs. Walmsleys' name is known in almost every country of the world, and their products, both in Britain and Canada, are "second to none."

YOU AND THE BOSS.

Remember that the boss has much to do, and many things to think of. He hired you. You may be the whole show. But who guarantees the "gate?"

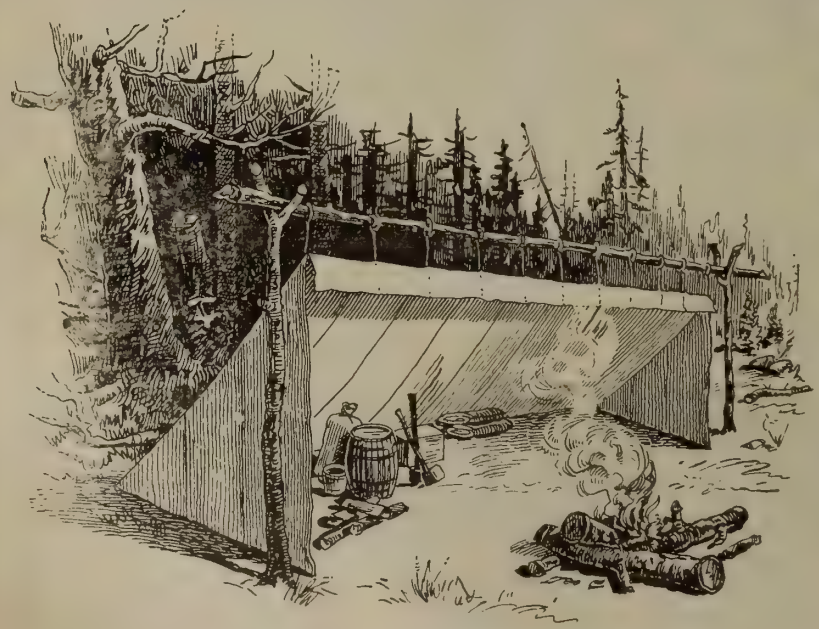
There's just one man can keep raising your pay. Look him square in the eyes and ask him about it —when you shave.

Whose job are you after—the man ahead of you or the one behind? Look out! You may get it.

You're always in business for yourself. It might pay you to give the boss a bargain now and then.

WHO WOULD?

The principal of a school in Superior, Arizona, says J. C. Rouse, Safety Engineer of the Magma Copper Company of that city, included in an examination a first-aid question, to wit: "How would you care for a man with a broken leg?" The answer by a Mexican girl who assumed she would have no use for a man with a hitch in the get-away, was—'I would not care for a man with a broken leg."



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Complete Power Equipment From Liquidating Mill

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BOILERS

CG 431 T.—Three 208 H.P. Smith HRT boilers, 78″ in diameter x 16′, 150 lbs. pressure. 150 tubes 3″ x 16′, 2,000 sq. ft. heating surface, 52 sq. ft. grate surface, ⅝″ shell, 9-16″ heads, longitudinal seam double butt strapped, quadruple riveted, girth seam single riveted. Complete with Coe's shaking grates, Vulcan soot blowers, Burrows automatic water regulator, horizontal return stop and check valve and catalog fittings. Two boilers are equipped with Foster superheaters for 125° super heat. Hartford insurance for 155 lbs. pressure 1920 inspection. Very good condition.

CG 431 U.—One 200 H.P. B. & W. Sterling water tube boiler, 10′ x 15′ 11″ x 18′ 7″ high; 3 steam drums, 36″ diameter x 10′ 3- ⅜″ long, of ⅜″ steel: steam drum tube sheet ⅝″ thick; 160 lbs working pressure, lap joint construction. 42″ mud drum with 7-16″ shell, and 11-16″ tube sheet. 3¼″ tubes. Heating surface 2,000 sq. ft., grate surface 56.25 sq. ft. Complete with Foster superheaters for 125° super heat. Diamond soot blowers, Coe's automatic feed water regulator and low water line, Coe's shaking grates, catalog fittings. Excellent condition.

CG 431 V.—One 218 H.P. Dillon HRT boiler, 78″ dia. x 20′ long, flush ends, flush front, single setting. I-beam suspension, 114-3½″ tubes, 20′ long, 2,200 sq. ft. heating surface. 49 sq. ft. grate surface, shell 19-32″ thick, heads ⅝″ thick, double butt strap, quadruple riveted. 156 lbs. pressure, A.S.M.E. code. Complete with Coe's shaking grates, Vulcan soot blowers, Burrows Automatic water regulator. Excellent condition.

BAROMETRIC CONDENSER

CG 431 Z.—One 14″ Buckley Barometric condenser, 14″ steam inlet, 5″ water supply and tail pipe fitted with 10′ atmospheric relief. Floor space 3′ x 3′, overall height 15′. Good condition.

ENGINES

CG 431 K.—One 125 H.P. Chandler & Taylor horizontal steam engine, size 14″ x 18″, 140 R.P.M., Tangye frame, left hand slide valve, flywheel, 16″ dia. x 16″ face, 4½″ steam, 6″ exhaust, Gardner governor, Nathan lubricator, oil cups and throttle valves. Floor space 8′ 6″ x 12′. Numerous spare parts. Fair condition.

CG 431 D.—One 140 H. P. De LaVergne oil engine, Type D 245, Specification P, Cylinder 20″ diam. x 34″ stroke. 164 R.P.M., flywheel 138″ dia. x 15″ face. Weighing 13 tons. Machine is provided with air compressor for oil feed but no pressure tank for starter. Numerous spare parts.

CG 431 L.—One 150 H.P. Ames horizontal automatic steam engine, 16″ x 18″, 225 R.P.M., with 80 lbs. initial steam pressure and 5 lbs. back pressure, side crank, flywheel governor. Flywheel 70″ x 16″ face, weighing 3,600 lbs. Complete with throttle valves, cylinder lubricator, and gravity oiling system for bearings, vertical steam separator, etc.

CG 431 M.—One 125 H.P. Chandler & Taylor horizontal steam engine 14″ x 18″ Tangye frame, left hand, side crank, slide valve with Gardner governor, 4½″ steam inlet, 6″ exhaust, floor space 9′ x 12′. Numerous spare parts included.

CG 431 N.—One 250 H.P. Improved Green automatic horizontal steam engine, 20″ x 42″ with double ported slide valves, left hand, detached girder frame, 106 R.P.M. with 90 lbs. initial steam pressure. 7″ steam inlet, 9″ exhaust, operating noncondensing, exhausting at atmospheric pressure. Split flywheel 12′ diam. x 30″ face. Complete with throttle valve, steam separator, sight feed lubricator and oil cups. Numerous spare parts included. Fair condition.

CG 431 O.—One 300 H.P. Kerr mixed pressure turbine, size F. 5, speed 2,200 R.P.M. 4″ high pressure, 8″ low pressure steam inlets, 16″ exhaust; 4-1 herring bone speed reducing gear, connected by flexible coupling to rotor shaft; belt pulley 20″ diam. x 31″ face. Provided with force feed lubricating system. Numerous spare parts included.

GG 431 P.—One 10 H.P. Donnegan & Swift Metropolitan horizontal steam engine, 7″ x 8″, side crank self contained. Flywheel 34″ x 8″, belt wheel 38″ x 6″, 1½″ steam, 2″ exhaust. Complete with Gardner governor, throttle valve, one pint Nathan lubricator. Good condition.

CG 431 Q.—One 5″ x 6″ Sturtevant vertical steam engine, self contained, center crank, governor wheel 30″ diam. x 6″ face, belt wheel 30″ diam. x 6″ face, 1″ steam 1¼″ exhaust. Complete with one pint cylinder lubricator and oil cups.

CG 431 R.—One 5¾ x6″ Greenfield, vertical steam engine, self contained, center crank, flywheel governor, flywheel 24″ diam. x 5″ face, 1″ steam, 1¼″ exhaust, one pint cylinder lubricator ant oil cups.

CG 431 S.—One 5″ x 6″ Donnegan & Swift Acme vertical steam engine, 1″ steam inlet, 1¼″ exhaust, self contained side crank, flywheel 24″ diam. x 5″ face. One pint cylinder lubricator and oil cups.

ENGINE GENERATOR SETS

CG 431 X.—One 7 KW General Electric Marine type engine generator set, 5″ x 4½″ vertical steam engine, direct connected to type MP Class 6-7-550 Form C, 110 volt D.C. generator, 64 amps., engine rated at 10 H.P.. Complete with switchboard. Very good condition.

CG 431 Y.—One 10 KW Westinghouse 125 volt D.C. engine generator set 80 amps., 825 R.P.M., frame type S No. 5, belt pulley 12½″ diam. x 8″ face. Complete with slide rails and pulley and switchboard, including field rheostat. Driven by 7″ x 8″ Vim horiz. automatic steam engine, Size No. 3, Center crank, 2 flywheels, 34″ diam. x 9″ face, flywheel governor, steam separator. Good condition.

FEED WATER HEATER

CG 431 W.—One 2,500 H.P. Cochrane open type feed water heater, 9′ 5″ x 4′ 0″ x 8′ 3″ high, with recording meter; cast iron shell with 20 trays 28″ long x 12″ wide, arranged in 4 rows equipped with "V "notch Weir, and single clock driven recorder, with integrator and a flow indicator; capacity of Weir 90,000 lbs. per hour. Equipped with Cochrane baffle plate type oil separator. Excellent condition.

GENERATOR

CG 431 J.—One 20 KW Western Electric generator Type ML, 115 to 125 volts D.C., 1,200 R.P.M., 160 amps.; Compound wound; Belt pulley 8″ diam. x 7″ face. Complete with switchboard, circuit breaker and field rheostat. Excellent condition.

SMOKE STACKS

CG 431 A.—One 54″ x 100′ Guyed steel stack; 55′ of 5-16″ and 45′ of ¼″ steel resting on cast iron bed plate. Fitted with 2 Guy bands. Good condition.

CG 431 B.—One 48″ x 95′ Guyed steel stack ¼″ thick, resting on cast iron bed plate, 2 Guy bands. Good condition.

CG 431 C.—One 54″ x 80′ Guyed steel stack ¼″ thick, resting on top of short brick stack. 2 Guy bands. Good condition.

WATER WHEELS

CG 431 H.—One 37 H.P.vertical water wheel, built by S. Morgan Smith Co., York, Pa.; size 27″, left hand, 150 R.P.M., with 8′ 2″ head. Set in open wheel pit. Fair condition.

CG 431 I.—One 78 H.P. vertical water wheel, built by S. Morgan Smith Co., York, Pa.; size 39″, right hand, 150 R.P.M., with 8′ 2″ head. Set in open wheel pit. Fair condition.

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Transactions of the Technical Section

THE MICROSCOPE AND ITS RELATION TO THE PULP AND PAPER MILL.*

By I. L. GARTLAND.

In presenting this paper, I shall be happy if I can even partially establish with you gentlemen my own conviction that ultimately the miscroscope will be the most used instrument in the laboratories of the pulp and paper industry.

Probably the best way to make a start at an informal discussion of this subject is to say something about the construction and use of the microscope itself—lenses, accessories, types of instruments, etc. In doing this thing I am, of course, facing the danger of repeating matter with which many of my hearers are quite familiar; but there seems to be no other way around it, and I must ask for the indulgence of those already familiar with this matter.

First the lenses; there are six different types of lenses: (1) Convexo-concave (also called "Meniscus"); (2) Plano-convexo; (3) Double convexo; (4) Double concave; (5) Plano-concave; (6) Concave-convex. The mere names of these lenses are probably a sufficient description, if we remember that convex is bent outward and concave is bent inward.

Now the whole system of building objectives is the intelligent use of one or more of the six varieties of lenses (together with prisms) to accomplish the kind of work for which a given objective is intended. Objectives are named from the extreme range at which they will focus — thus every objective falls somewhere between the 16 mm. objective and the 1.9 mm. oil immersion type.

To understand the work of a microscope better, it will also be well to discuss refraction for a moment: Refraction is, in a simple language, the phenomenon that occurs when a ray of light passes through any transparent medium — the medium "bends" the ray of light. This ability of lenses to bend light rays gives them their magnifying power. There are two fundamental laws of refraction which we would well have in mind in going on with this dicussion:

(1) When a ray of light passes from a denser to a rarer medium, it is refracted (or bent) away from a line drawn perpendicular to the plane which divides the medium—and vice versa.

(2) The sines of the angles of incidence and refraction (that is to say, of the angles which the ray makes with the perpendicular immediately before and after it is refracted) bear a constant ratio to one another in a given substance. This ratio is known as the "index of refraction" for that substance.

A medium in addition to the glass slides must be used for high-power objectives in microscopy. This additional medium (a drop of cedar oil is now almost invariably used) having the same index of refraction as the glass, prevents the light rays from diverging from the normal — gathers them, in other words, at the lowest point of the objective, which is exactly where we want them.

There is an index refraction known as the numerical aperture, which is the index of refraction of the sine of half the aperture.

Convexo lenses are chiefly used in microscopy. The other forms, mentioned above, are used to make certain modifications in the rays passing through these convexo lenses so as to exact their performance. It is difficult, however, to construct a convex lens so that all the rays of light that pass through it shall come to the same focus. The rays which transverse each peripheral or marginal portion are of shorter focus than those which pass through the central portion. This naturally distorts the image and is technically known as spherical aberration. Another aberration which, when light transverses a convexo lens and the different colors which compose it, do not all come to the same focus, is known as chromatic or color distortion. The correction for this is the exclusion of the marginal rays and it has been found that lenses whose penetration is greater than "their flatness of field" these color fringes are usually present. The correction of both these aberrations is entirely up to the optician, and when purchasing objectives, should be taken into consideration.

The Principal Types of Objectives.

There are two principal types — dry and immersion. In dry objectives, nothing intervenes between the object and the objective except, of course, air. In the immersion objective, however, some liquid medium, such as water or oil, must be placed on the cover glass over the object and make a contact between the cover glass and the objective. The most commonly used objective is the homogeneous oil immersion, the reason for this being, that with objectives of this type, the oil has the same refractive index as the front lens of the objective, (cedar oil for example).

There are also non-achromatic objects in which the color distortion is not corrected and the image produced is usually bordered by a color fringe.

Chromatic objectives are those in which the color distortions are corrected.

Aplanatic objectives are those in which the spherical aberration is corrected.

Apochromatic objectives are those in which three spectral colors combine to one focus instead of two, as with the chromatic.

There are, of course, a number of special objectives such as those with collar corrections, those with shields for paraboloid condensors used with the ultra microscope, and so on.

Kinds of "Oculars."

Of the oculars or eye lenses, there are the ordinary Huygenian eye piece, the compensating and the projecting oculars. Each one, the objective and the ocular magnifying independent, but combined, give us our ultimate visual magnification. It must always be remembered that the objective's function is to magnify the object and the ocular's function is to magnify again what the objective has already magnified.

Best Sources Of Light.

While on the subject of light, (a sadly neglected necessary), a further word may not be amiss: The very best possible light that could be used in microscopy is the reflection from a white cloud. However,

* Paper read at the annual meeting of the Technical Section, Jan. 19, 1920. Slightly abbreviated by the Editor.

if artificial light is necessary, there are two or three very good makes of lamps on the market. The principle, however, is to use just sufficient light to illuminate evenly the object to be viewed, as an excess of light will not only distort the object, but will flood the objective so much that it is sometimes impossible even to view the object. It is wise to use a filter on the iris diaphragm or at the front point of the lamp for eliminating the intense rays of the filament of the ordinary bulb. Usually a round blue glass accompanies all microscopes and should be used as much as possible.

Microscopic Accessories:

There are, I believe, some important accessories which are quite unfamiliar to the average chemist and which, sometimes, are of a great deal of assistance in short cutting and eliminating unnecessary work. For instance, the dissecting-scope. This is an excellent accessory for surface investigations of coated papers and is also of very much assistance in teasing out fibres preparatory to staining and mounting. The stage of the dissecting-scope is also excellent for mounting, as it is usually of glass and balsam or Ferrant's medium and is very readily removed.

The camera lucida is a very economical, but sometimes tedious methods of keeping records of microscopic slides. It consists of a prism which is silvered on one plane in the center of which is a small hole. The silvered section of this prism is on an angle so that it reflects through the medium of a mirror at the right, the pencil point ten inches below the eyepoint and through an optional illusion it combines with the visual transmission of the object, thus enabling the operator to outline on the paper below the mirror, the object which he sees through this small opening. This is also an excellent instrument for measuring objects.

Abbe condensers are quite frequently neglected and their relationship to the better definition of the object to be viewed often forgotten. Most microscopes having Abbe condensers are fitted so that it is possible to adjust these condensers and raise or lower them so that the cone of light on the object will be either increased or diminished. The iris diaphragm should be about 2/3 the diameter of the field when looking down the tube, with the ocular removed. If this rule is followed, a great deal of unnecessary changing of lights, etc. will be avoided.

Permanent and Temporary Mounting:

A very serious problem has been to distinguish between what should be permanently mounted and what should be temporarily mounted. In the past the objection to permanent mounts was the waste of both cover glasses and slides and frequently specimens which were only temporarily mounted spoiled. It has been found, however, that the most anything that is worth while can be mounted in a permanent form. And, if, at a later date, the slide becomes useless, it can be cleaned with a solution which will save not only the slide but the cover glass. The formula for this is 50 c. c. of water, 45 c. c. of ethyl alcohol and 5 c. c. of ammonia. By using a staining dish and immersing slides to be cleaned in this solution for about one week or ten days, the mounting medium is entirely removed and the slide and cover glass need only be washed with cold water.

There is still another method of mounting permanently and that is with shellac, or gold size and the use of a turn table. This is especially good for mounting permanent slides of microchemical compounds and the cell in which the mount is to be made can be regulated at the will of the microscopist.

Manipulation:

Before passing on to the subject of the use of the microscope in the paper mill, it might be well to mention a few things in regard to the general manipulation of this instrument. When balsam oil drops on the stage, it is advisable to remove it as quickly as possible and a little Xylol is excellent for this purpose. In using an oil immersion lense, it should always be wiped immediately after the immersion has been performed with lense paper. No other oil but regular cedar oil manufactured for immersion purposes should be used.

In attaching a mechanical stage, frequently in the laboratory it is merely adjusted to the scope stage and let go at that, the result being that the stage will sometimes work more easily in one direction than in the other, or it will not work at all. This is overcome by placing a very thin piece of cardboard on the stage and then clamping down the mechanical stage; on removing the cardboard, a space is supplied wherein the stage easily works in both directions.

Quite often the use of the micrometer in measuring fibre length is necessary. Aside from its inconvenience, the simplest and most satisfactory form is the stage and ocular micrometer combination. Many chemists are opposed to this method because they cannot readily find the lines on the stage micrometer. If, in the use of this, a little ink is rubbed horizontally across the slides on both sides and let dry, it finds its way into the grooves of the etching and the lines become perceptible.

Standard Slides.

Properly and intelligently to analyze the microscopic structures of celluolse, silicious, earth, metals, etc. a standard set of slides should be on hand. These may be purchased already prepared, as for example, the accompanying arrangement of diatoms made by Bausch & Lomb, or the microscopist himself may make them. This is far to be preferred, for in the making of slides one becomes more accustomed to the character of the substances being prepared, familiarizing himself with the structure, etc. more so than if purchased slides were merely looked at.

In the wood room of a paper or pulp mill, one will find the greatest variety of woods from which to make one's own slides and it is hardly necessary to purchase standard slides with this material available. This is accomplished by obtaining a section of wood about 5'' x 10'', or thereabouts, and with an ordinary carpenter's plane, shavings can be had both longitudinally and perpendicularly. It is better, in choosing specimens, to take the ends of these shavings as the sections are then much thinner and therefore more transparent. It is often difficult, particularly with cedars, to get a transverse section and it might be necessary to make a bias cut. This shou be noted on the slide.

The most satisfactory permanent method of mounting these cross and longitudinal sections is with the aid of the turn table and the making of cement rings, in other words an air dry mount. The reason for this is that balsam has a tendency eventually to dissolve the cellulose contents in these cross sections and Ferrant's medium is extremely difficult to obtain.

Sometimes it is necessary to permanently mount

cross sections of stems of different trees and plants. This is very easily accomplished by the use of a hand microtome and an ordinary razor. A small piece of the stem, say one inch long is imbedded in the microtome with liquid paraffine and allowed to harden. It is simply a matter of shaving off the finest possible section obtainable. In this way the structure and sometimes the storage granules may be seen.

Microscopic Analysis of Paper.

All of us are, no doubt, familiar with the general course of procedure in the microscopic analysis of paper, so it is, I believe, not necessary to go into detail along these lines. There are one or two hints which might be of great interest to the chemist and that is the application of reagents and stains.

It is wise when your specimen is ready to be stained, to lay the cover glass over it and, taking a drop of reagent on a glass tube, place it on the outer edge of the cover glass. It will then irrigate to the centre and completely stain the object. This have saved a great deal of trouble and often avoided the entire loss of the specimen.

Another suggestion is, in the disintegration of the pulpy mass, it has been customary to shake the test tube containing these ingredients by hand, but a physician's centrifugal urine apparatus has been found very satisfactory and as many as six samples of different kinds of pulp can be shaken at once, again saving considerable time.

Chemical Microscopy.

In the preface of Professor Chamot's work "Elementary Chemical Microscopy," he writes: "The failure of the chemists to obtain from the microscope all that the instrument is capable of yielding is perhaps largely due, first to the fact that few of them are given an opportunity of becoming sufficiently familiar with that instrument and its accessories and second, they are not aware of the great variety of problems which are solvable through the microscope nor of the specific sort of problems for the investigation of which this is the instrument par excellence. Third, there has been a lack of elementary manuals covering the field and for this reason the microscope has been looked upon as an instrument peculiar to the biological laboratory.

Principles of Chemical Microscopy.

As the fundamental principles of chemical microscopy are crystals and indeed the most interesing, I believe they are worth while presenting as a basis for discussion. There are unlimited possibilities for their use in the paper industry, as frequently the samples of some specially treated paper are too small to make an elaborate chemical analysis and the possibilities are that when this field is thoroughly covered, unnecessary work and inconvenience will be entirely eliminated by making the chemical analysis of a sheet paper under the microscope.

At the present time, unfortunately, our source of reference is very much limited. Emil Chamot has produced, so far as I can find, one of the best up-to-date works on Chemical Microscopy and it is my intention to try and interest you in this subject.

Photomicrography.

There are some things which present themselves in our daily laboratory procedure which impress us. These things are more or less imprinted on our minds and when occasion presents itself may be put into use through the recalling of such and such a circumstance.

The Construction Department, for instance, make it their business to record (by the use of the camera) certain developments in the progress of a building. This is done so that it may aid the engineering force in future work.

And so by combining the camera with the microscope, we could record infallibly, exact resultant developments. The mode of procedure is simple and patience the greatest asset. The camera I have used taking microphotographs was a Graflex 8 x 10, the microscope and Seibert (which is equal to Leitz A 1 type) with an objective No. 3 (American equivalent ⅛ inch). For illumination a gas filled 220 volt 110 watt bulb and a bull's-eye condenser were employed. This was done so that the light may not only be concentrated, but the color distortion caused by the filaments eliminated. The average time and exposure was 30 seconds. In one instance the cross section, which was stained with "Eosine", a red filter was used, but in the chemicals, filter No. "H" (Blue) was used. There was lack of detail in construction and the cell walls were so indistinct. This serves to illustrate what would happen if the sample of cellulose was stained with Herzberg stain and if a large percentage of cotton, linen or hemp were present and a red filter used.

With the same cross section but a green filter the difference is certainly apparent. In using the Herzberg stain and photographing after it has been applied to the pulp, care should be taken in the choosing of filters as too much contrast should not be obtained, or a result will be a choking of shadows with the loss of detail, as in the instance of the cross section stained with Eosine. Fundamentally, we have with the application of the Herzberg stain, four prominent colors; red, blue, yellow and violet. Between blue and violet there is liable to be a slight difference and consideration must be made in the choosing of filters for photographing after staining. For instance, it may be necessary to combine filters, based, of course, on their spectral wave lengths. Hence in photographing violet filters D & H with a dominant wave length of 4,500, may be used; or for blue, filters C & H with a wave length of 4,800, or for yellow, filters B & G with a wave length of 5,500 and with red filter "F" with a wave length of 6,250. By dividing filters into pairs, the spectrum is divided into approximately monochromatic portions and as a general rule, when contrast is required for blue use a red filter, for green, red and for red, green, for yellow, blue and for violet, yellow. It is impossible, however, to lay down any laws regarding the use of filters and the operator must use his own judgment after a visual inspection of what should be photographed.

(To be concluded with comment by H. N. Lee.)

HOWARD SMITH PAPER MILLS, LIMITED, ARE OPTIMISTS, N.B.—

When you get right down to facts, business in Canada is not bad—only a little harder to get.

Imports into Canada are increasing month by month, which shows that the demand for goods is active.

If the Canadian manufacturer gets after business in his home market with energy and enthusiasm, imports will be checked and Canadian business stimulated.

A new daily paper, established in Boston, and called the Boston "Telegram", made its appearance last week. It is an evening paper and sells for the old pre-war price of one cent per copy.

News From Europe

The Paper Market in Norway.

The falling off in prices has had little effect, the market has received a fillip, but that is about all. This is perhaps as well. The future may conceivably possess all the virtues attributed to it by optimists, but the fact remains that buying can only commence in a satisfactory measure when the "price ideas of sellers and consumers meet." Apparently the prospect of a more active market is not so remote as it was. Feelers are being put out from various quarters, and some paper makers have purchased considerable amounts of pulp to meet their contract requirements. The truth seems to be that, the market having been unduly depressed by lack of confidence, is likely to appreciate sharply again.—Papir-Journalen, January 29 and February 19, 1921.

Pulpwood Supply of Europe.

Perhaps the most satisfactory feature of the past month in the paper trade of Europe is the exploitation of timber and the distribution of pulp-woods in countries where the laggard development of industry is one of the inevitable consequences of the war. Among other causes of this exploitation is the almost complete absence of American supplies from the markets. The explanation generally accepted is as follows: "From the American point of view the timber trade with France, Belgium and Holland has virtually stopped. Dealers in both of the countries first named regard American prices as exorbitant, and the mills are assisting each other with substitutes. For instance in France and Belgium native ash is preferred. French ash costs about 500 francs a cubic meter, as compared with 1,000 francs for the American variety. In Belgium, ash from Germany and Austria is in good demand. Attempts have also been made to introduce Douglas fir in Belgium as a substitute for pine. Holland, taking advantage of exchange, has imported large quantities of standard sizes from Germany and Austria. Within the past month Lithuania has reappeared as a source of pulpwoods. In Poland conditions continue very obscure. The railways are in need of cars, locomotives, and, above all, repair shops with the skilled labor necessary.—Holz-Welt, December 17, 1920.

Restoration of French Forests—Turn in Prices.

While the forest industries in Europe generally, and even in Austria, appear to be making rapid strides, the latest reports disclose an unsatisfactory state of affairs in France. "The attention of the Committee of the Forest Society is drawn to the lamentable condition of the forests and shrubs in the zone of military operations, in most of which nothing has yet been done to restore the soil to its normal state. The work required consists in cleaning and levelling the ground, removing the wire fences, filling up trenches, excavations, planting, etc."—Le Bois, March 3, 1921.

In connection with prices there is one point which traders should particularly notice. There are certain sizes which have a ready sale, such as 2 x 7, 2½ x 7, 2 x 4, 2 x 3. For 7-inch battens the spot prices may be said to be about 35 to 36 pounds for unassorted red wood. Shippers who endeavor to place large quantities of 6½, 4½, and 5-inch sizes must expect a heavy reduction in price. These dimensions probably account for the high quotations of imported timber on the French and British markets.—Affarsvarlden, February 23, 1921.

The Central Association of Finnish Timber Industries has just issued a report on the economic aspects of the privately owned and companies' forests. Pine predominates on both; pine and fir cover 78 per cent of the companies' holdings and 73 per cent of the private lands. The proportion which the number of deciduous trees on the companies' land bears to those on the private estates is, however, much smaller. But in all that relates to renewal of timber, cutting, and thinning, the value of industrial exploitation is conspicuous.—Finsk Pappers—Och Travarutidskrift. December 31, 1920.

These various reports agree in one particular of no little importance to the paper industry at large, that in the present condition of Europe Germany occupies a relatively favorable position, which may lead to a corresponding development of paper making in that country.

Higher Postal Rates in Germany.

A protest is being made against the Government's proposal to meet the billion mark deficit of the Post Office by raising the rates. The memorial is signed by 55 different trade associations. It is pointed out that the last increase in rates failed utterly to produce the revenue desired. There is not the slightest reason for imposing this additional tax on newspapers and periodicals. One industry—the picture post-card—has been almost entirely ruined. As a matter of fact our industries need a lower postal rate, and it is fairly obvious that business would be increased thereby.—Papier-Market, March, 1921.

Canadian Mill Seen in Norway.

The meeting on February 1, had a special interest, for it was marked by a scenic display, or in ordinary prose, a cinema in which the plant and processes of the Kipawa mills were shown on the film. Mr. C. B. Thorne, Vice President of the Riordon Company, Ltd., and Mr. O. L. Berger, of the G. D. Jenssen Company, were present. Papers on the "Labor Situation in the English Industry" were read by Mr. N. W. Rogstad. Perhaps even more than any others are the Canadian mills objects of interest and admiration; certainly the fact that the films were also displayed in a theatre is an unmistakable sign of the curiosity with which Europeans regard undertakings on a scale larger than that to which they are accustomed.—Papir-Journalen, February 19, 1921.

Polish Paper Situation.

Poland is just now passing through a paper crisis, reports Trade Commissioner Louis E. Van Norman. A carload of poor quality paper which before the war cost about 2,000 marks now costs 500,000 marks. A carload of vellum paper that previously cast 5,000 marks is hard to get now at 1,000,000 marks. The publishing of books is almost at a standstill, even schoolbooks being a luxury.

The minimum production for local consumption should be at least 30 carloads of cellulose per day. The only Polish factory for cellulose, in Wloclawek, produced 7 carloads per day before the war, and Finland supplies the rest. Today, England is importing most of what Finland manufactures, and the factory at Wloclawek produces only 5 carloads daily.

Before the war this factory belonged to German capitalists, and it is now owned by "the paper company of Robert Saenger in Pabianice." Its cellulose is distributed among paper factories in Wloclawek, Pabianice, Myszkowiec, Czestochowa, and a few smaller factories.

Belgian Paper Industry in 1920

(Special contribution to Pulp and Paper Magazine.)

1919 was a quite abnormal year owing to the general disturbance of Belgian industries, as a result of the deportation of machinery and raw materials during the German occupation. It was not until the second half of the year that the paper industry was in a position to meet on a more or less normal way, the increasing demands of the domestic market.

On account of this situation exports were relatively low. They amounted for 1920 to 40 per cent. to 50 per cent. of those of 1913.

The total production of board and paper amounted for the same year to about 130,000 tons, being 25 to 30 per cent. more than in the immediate years before the war. It is noteworthy that this higher production was obtained with less machines than in said years, which may be explained chiefly by the fact that because of brisk demand, mills were constantly dominating the situation and could arbitrarily impose such conditions with regard to size, substance and smallest quantity, as to suit best the requirements of their respective machines.

The activity grew more and more intense, till the middle of the year. Increase of foreign rates of exchange, and consequently of the cost of pulp and of other raw materials, higher wages were followed step by step by advances of paper prices without discouraging buyers, inducing them rather to cover their needs by ample supplies, in order to anticipate further possible rises.

Is it to be wondered, that in such conditions stocks soon grew larger than they reasonably ought to have been? That in more than one sound business, transactions degenerated in speculative operations, with all their temptations, but also with all their dangers?

As soon as the wage reduction was announced from America, purchasers got hesitating and refrained from buying. Mills took the matter up calmly, partly because they considered this abstinence as a temporary caprice, as a regular feature of holiday seasons, but chiefly because most of them were behind with their deliveries and had orders on their books for several months.

Another factor, to which till then too little importance had been attached, viz., the German competition, began to alarm buyers and to unsettle the market. German offers were overflowing the country in August at prices—reported at that time in "Pulp and Paper" —about 40 per cent. under the current prices.

To what degree they met with success is shown in the following:

Imports of paper and board for 1920 aggregated 29,126,288, of which 31.6 per cent. came from Germany, 28.8 per cent. from Holland, 14.8 per cent. from Great Britain, 3.2 per cent. from Norway, 7.3 per cent. from Sweden, and 14.3 from other countries, increasing from 37 per cent. to 59 per cent. of the total from September to December.

Orders passed for a great deal into German hands. From that moment it was impossible to liquidate accumulated stocks, under conditions which may have safeguarded , to some extent, the mutual interests of the parties concerned, and all efforts, even at serious sacrifice, to realize a revival of the trade proved vain. After having been working for several weeks at short time, mills started in December to shut down part or all of their machines for an indefinite period. At pre-

Imports and Exports 1919-1920.

NEWSPRINT (DUTIABLE)

	(Origin) Imports.		(Destination)	Exports.
	1919	1920	1919	1920.
China				127.082
France				352.813
Germany		1.381.648		
Gt. Brit:	1.102.361			
Holland	6.217.206	3.584.223		
Othr. Ctrs:	816.844	441.041	99.801	480.769
Total Kg.	8.136.411	5.406.912	99.801	960.669
Value F.e.s	8.025.547	9.895.140	150.527	2.499.036

NON DENOMINATED PAPERS (DUTIABLE)

Argentine				399.884
Australia				297.480
Brazil				294.734
Brit: India				734.106
Germany	1.288.472	5.367.315		
Gt. Brit:	2.617.712	2.841.476	1.799.406	5.286.238
France	1.000.161	1.735.772	580.195	10.096.828
Holland	3.299.399	2.367.538	340.259	1.711.638
Norway	637.981	661.083		
Sweden	1.157.445	1.625.102		
Switzld:				316.485
Utd: States				767.170
Othr. Ctrs:	325.747	899.581	754.780	3.351.606
Total Kg.	10.326.917	15.487.867	3.474.640	23.563.669
Value F.e.s	18.900.897	42.795.260	10.291.652	78.079.011

WOOD PULP. (FREE).

	(Origin) Imports.		(Destination)	Exports.
	1919	1920	1919	1920
Canada		1.618.388		
Finland		5.661.958		
France			1.206.962	14.710.281
Germany	416.372	1.997.799		
Holland	4.447.987	1.490.247		
Norway	23.072.578	51.194.361		
Sweden	20.777.860	50.995.705		
Othr. Ctrs.	6.291.904	1.573.257	151.831	971.422
Total Kg.	54.978.061	114.531.715	1.445.113	15.681.703
Value Fcs.	37.264.444	153.612.544	1.413.562	22.585.631

WALLPAPER (DUTIABLE).

France	482.753	583.231	330.037	1.552.991
Germany	191.996	487.515		
Gt. Brit:	1.416.019	779.171		
Othr. Ctrs.	158.438	153.538	199.251	707.626
Total Kg.	1.889.206	2.003.500	529.288	2.240.617
Value Fcs.	5.307.416	8.389.608	1.967.395	8.941.948

BOARD. (DUTIABLE).

Finland		395.240		
France				629.455
Germany		1.938.315		
Gt. Brit:	729.703	679.848		315.120
Holland	2.990.000	2.265.168		
Sweden	536.932	322.497		
Othr. Ctrs:	258.188	626.941	52.075	105.446
Total Kg.	4.524.823	6.228.009	52.075	1.049.021
Value Fcs.	4.641.493	10.119.126	62.431	2.101.306

Summary of Imports and Exports.

IMPORTS.

	Quantity Kg.	Value Fcs.	(Increase %) Quantity	Value.
		Wood Pulp.		
1919	54.978.061	37.264.444		
1920	114.531.715	153.612.544	108	312
		Board and Paper.		
1919	24.867.357	36.875.353		
1920	29.126.288	71.199.134	17	93

EXPORTS.

	Quantity Kg.	Value Fcs.	(Increase %) Quantity	Value.
		Wood Pulp.		
1919	1.445.113	1.413.562		
1920	15.681.703	22.585.631	1054	1497
		Board and Paper.		
1919	4.155.804	12.467.007		
1920	27.813.976	91.621.301	569	634

sent more than 50 per cent. of the 94 paper and board machines are inactive. Employees are kept at work on repairs and upkeep, so that they may be available in case the depression should come unexpectedly to an end.

That mills are anxiously looking out for this moment will be easily understood, if one considers that most of them are handicapped by large stocks of pulp, purchased at high prices, that several mills have still to take delivery of lots contracted for months ago, and that in the meantime paper prices are continually going down, and have attained at present a level far below the cost price of the pulp.

Prices are today about as follows, per kg. at the mill: Straw board, 0.75 fr; brown wrapping, 1.95 fr.; kraft, 2.10 fr.; ordinary wrapping, 2.10 fr.; strong sulphite, 2.60 fr.; butchers' imitation parchment, 2.50 fr.; bleached, 3.40 fr.; grease proof, 2.90 to 3.70 fr.; newsprint, 1.65 fr.; ordinary printing, 2.25 fr.; woodfree printing, 3.25 fr.; vegetable parchment, 5.25 fr.

The impression is reigning that these prices will still go back. Notwithstanding repeated and important reductions granted these last months, few transactions are being made, and orders are only passed on condition of immediate delivery.

It is clear that in the conditions explained, the pulp market is more than quiet. No transactions at all are being made and there are no regular prices, as these also are continually going down.

Quotations were these last days about as follows, per 100 kg., f.o.b. Antwerp: Bleached sulphite 240 frs.; easy bleaching, 210 frs.; strong sulphite, 190 to 200 frs.; kraft, 150 to 160 frs.; mechanical, 120 to 130 frs.

The market in the other materials is somewhat better, although purchases are only made in very limited quantities: Sulpate of alumina is quoted 80 fr. per 100 kg,; rosin, 125 fr. per 100 kg.; rags, 65 fr. for common, up to 350 fr. per 100 kg. for the better sorts.

A NEW AMERICAN CLAY FOR LOADING PAPER.

A highly colloidal clay which exists in large deposits in the intermountain region of the United States has been found by the U. S. Forest Products Laboratory to be valuable as a loading material for giving finish and printing qualities to book paper. When this clay is used in conjunction with English China clay, the retention of the English clay is materially increased, and the paper produced has a superior finish and appearance and a more velvety feel. The admixture of this clay similarly improves the retention of other fillers, and is especially desirable with some which have a low retention.

The ability of the new clay to remain in suspension may make feasible the installation in paper mills of a central mixing plant, from which the loading material can be piped a considerable distance to the beaters, without danger of settling or clogging of the pipe lines, and with the assurance that the concentration will remain uniform. The properties and use of the new loading material are more fully described in a report which may be obtained from the laboratory on request.

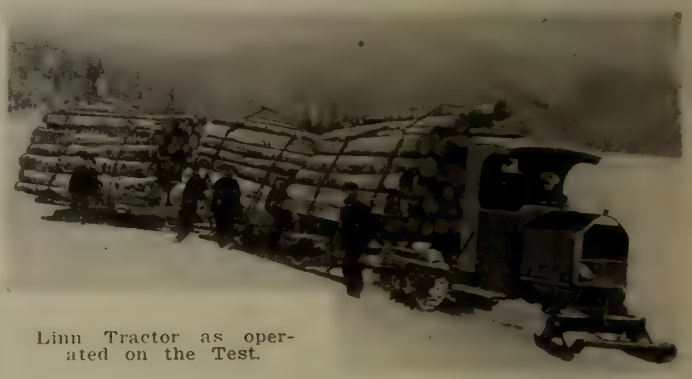
It costs a man to live today much more than it cost yesterday, but don't you think it's worth it ?

It takes a strong man to keep his face closed.

SUCCESSFUL TRACTOR TEST ON TIMBER.

The St. Maurice Paper Co. of Cap Madeleine, P. Q., have recently completed a test of Tractor Efficiency in the movement of logs—at their operations carried on at St. Donat—which is located 35 miles north of St. Agathe des Monts, Quebec.

The test was carried on over woods roads—newly opened this season—and over a governing grade of 18 per cent. It was found possible to continually haul three trailers over this four mile route, and move 180 logs on each trip, and, with a minimum of four round trips each day, a total of 720 logs a day, and by the same schedule 4,320 logs per week. It is estimated that with one tractor and three trailers to each train (9 trailers in all) one of these tractors can



Linn Tractor as operated on the Test.

accomplish the work of 12 teams. The trailers used were not special equipment but were built complete by the St. Maurice Paper Co. in their blacksmith shop at St. Donat. They are of the conventional type of heavy duty sled as manufactured by the Adams Wagon Co. at Woodstock, with but slight changes made for purpose of proper tracking with tractor on curves.

During the entire test the tractor was operated by an employe of the St. Maurice Paper Co. The machine used in this test was developed in the timber hauling business in the Catskill mountains and is probably the only heavy duty tractor developed purely to meet requirements of the timber producer. The St. Maurice Paper Company have placed an initial order for one of these machines.

NEW MEMBERS OF TECHNICAL SECTION.

Members of the Technical Section of the Canadian Pulp and Paper Association will be glad to know that R. W. Sterns, Abitibi Co., Iroquois Falls, Ont., and H. M. Lewis, of Provincial Paper Mills, Port Arthur, Ont., have been elected members of this Section.

A French Scientist states that the process followed in making paper does not eliminate micro-organisms. Living micro-organisms were found in Chinese MSS. 1,000 years old and in a piece of Egyptian papyrus more than 2,000 years old. These minute beings can rest immobile for 20 centuries apparently dead, but after immersion in sterilized water for 3 hours start wriggling as if newly come to life.

The paper mill at Sandford-on-Thames has been closed down and as a consequence over 100 employees have been thrown out of work. It is stated that all orders have been cancelled, the reason for the slump being that German mills have been sending paper into the country which undercut in prices the home product.

Some of the pulp mills are stopped in Sweden owing to the workers' strike.

British Trade News

(From Our London Correspondent.)

London, March 15, 1920.—Last month I commented on the attacks that were being made on Imperial Government Departments, by anti-waste advocates, in regard to expenditure on paper supplies. This week a concrete case has been given by the Government Stationery Office of what this Department has been doing and it is a nice set-back for the anti-wasters, who are always complaining of the cost of paper. The case was quoted in the House of Commons by Mr. Baldwin, who said that the total stocks of paper held by the Stationery Office were: January, 1914, 3,625 tons valued at £118,320; January, 1921, 7,700 tons valued at £639,000. He had no reason to believe that the purchase of paper by the Stationery Office had at any time a material effect on the advance of prices of paper. The office did not buy much paper at the high prices ruling in 1920, as since the Armistice the department had been living to a great extent on surplus war stocks and no Government control existed over paper mills in the United Kingdom. The inference to be drawn is, because contracts were given out to paper mills the anti-wasters thought the Government had some control over them, but the bubble is now pricked.

The Paper Situation.

There is no change in the paper market to announce, everything being dull and buyers standing aloof.

Sir Charles Eves, addressing the shareholders of the "Illustrated London News" and "Sketch," two pictorial papers printed on fine art and other high-class papers, said the cost of paper, which during 1919 had risen to what appeared then nearly the breaking point, had still further increased and during the latter months of the period under review it was between 30 per cent and 40 per cent higher than in the corresponding months of the previous year. The net result was a loss in trading profit and no dividend would be paid. With the return to more normal conditions—with a reduction in the price of paper, which was now in prospect and with a reduction in wages, he could not help thinking that there were very much better times in front of the papers.

As a result of high expenses the Leicester "Daily Post" ceases publication at the end of March. It was established in 1872. This is the third of England's oldest newspapers to close down since the new year and it shows how newsprint sellers and newspaper owners are being hit just now.

George Newnes, Ltd., and C. Arthur Pearson, Ltd., two of London's publishers whose names are world-wide, are amalgamating. The merging of these firms show how the publishing firms are being taxed and the high cost of production.

Swedish and Canadian papers are looked upon just now as very fair competitors with the home production. In some of the provincial newspapers I see a good share of Canadian newsprint. Makers of sulphite printing paper have agreed between themselves not to alter the present prices until April 30, when they will come up for revision. Reports from Norway and Sweden, however, say the market is steadier.

The Pulp Market.

The pulp market is also in a state of despondency and although sellers are prepared to meet buyers on reasonable grounds the dullness of the paper industry prevents business being done.

The imports of ground wood in tons for February last have been as follows: From Sweden, 105; Norway, 22,994; Canada, 90.

The total quantities of ground wood reached 23,189 tons in February, and the total for January-February is 51,342 tons, compared with 51,075 tons in 1920, the values being respectively £679,310 and £470,260.

In these figures the depression that has prevailed in the paper industry is keenly reflected.

Turning to chemical pulps the imports in tons were as follows:

	Bleached Sulphite.		Unbleached Sulphite.	
	Feb.	Jan.-Feb.	Feb.	Jan.-Feb.
Finland	1	1	927	1,028
Sweden	..	99	2,052	14,086
Norway	1,413	2,884	3,150	6,441
Germany	2	140	482	990
Other places	139	205	195	732

The imports of sulphite for January and February reached 3,389 tons, valued at £213,843, as against 6,443 tons in 1920, valued at £230,645. Unbleached imports 23,277 tons, valued at £1,025,164, compared with 80,615 tons in 1920 at £2,088,360. The supplies from "other places" include Canada.

Newsprint and Other Imports.

There is a falling-off in Canadian supplies of newsprint to the British market and this is much to be regretted (particularly when one considers the imports from Germany and Scandinavia). The imports reached 4,920 cwts., valued at £14,377, as against 36,748 cwts. valued at £57,130 for the corresponding period—that is January and February—in 1920.

The supplies from all sources of newsprint and writing paper in cwts. for February in 1920 and 1921, respectively, were as follows: Sweden, 35,755 and 59,-619; Norway, 58,701 and 10,110; Germany, 290 and 7,355; Belgium, 719 and 6,566; U.S.A., 2,148 and 65; Canada, 25,043; Other Places, 20,333 and 71,901; totals, 142,989 for 1920 and 155,615 for 1921.

The imports of packing and wrapping paper show a very material reduction of 91,765 cwts. in February, as against 304,906 cwts. for the corresponding period in 1920, the two months supplies reaching 192,419 cwts. for 1921 and 667,952 cwts. in 1920. The countries of supply with imports in cwt. for February, 1920 and 1921 are: Finland, 24,940 and 11,303; Sweden, 132,614 and 31,324; Norway, 99,848 and 12,773; Germany, 8,557 and 22,111; Belgium, 8,536 and 5,084; Canada, 14,865 and 1,610; Other Places, 18,546 and 7,560.

Coated papers also show a reduction in the imports 2,500 cwts. for the two months—9,433 cwts. as against 11,933 cwts. in 1920. Taking the imports and the exports figures of all kinds of paper and boards they are as follows:

	Feb.		Jan.-Feb.	
	1920	1921	1920	1921
Imports, cwts	853,104	472,572	1,861,932	874,845
Exports, cwt.	115,261	130,870	273,680	352,337

It will be seen that the exports of the British mills show a substantial increase and bear out what I have been recently commenting on, viz., that British mills were working up their export and concentrating their attention on it to keep the mills running. The coun-

tries to which exports were sent in February were as follows:

	Printing Paper,		Writing Paper,	
	1920	1921	1920	1921
France	6,123	875	2,950	289
U.S.A.	363	238	79	...
Other Foreign Places	15,810	11,429	2,715	2,502
B. Sth. Africa	1,918	9,722	154	876
B. India	7,814	10,417	3,699	1,696
Sts. Settlements	872	2,080	273	282
Ceylon	664	436	97	433
Australia	2,105	19,642	1,519	2,892
N. Zealand	480	7,852	455	2,657
Canada	72	436	4	42
Other British Places	3,686	3,717	476	1,104
Total cwts	39,907	66,844	12,421	12,763

A notable feature of the exports is the large increase in millboard, strawboard and cardboard shipments from the United Kingdom. Canada does a big trade with the British market in these lines. The exports during January and February reached 20,202 cwts. as against 5,628 cwts. in the same period of 1920.

The exports are not to say large, numerically, but they are sufficient to show that this section of the trade is being developed.

Finance.

The present situation is squeezing out small agents, in some cases, financially, but manufacturers are in a healthy position generally though the shares of their mills are quoted low at times. The British public have great confidence in the paper mill, as for instance 1,200 £1 (fully paid) shares in the Roach Paper Coy., near Preston, when offered were sold for £1 10s. each.

THE SECRET OF PREVENTING FOREST FIRES.

Mr. Henry Sorgius, manager of the St. Maurice Forest Protective Association of Three Rivers, Que., says:

"I can say that I am more than ever convinced that the chief method to be used in forest protection is a serious campaign of propaganda, and more money should be spent in educating the people to prevent forest fires. Through experience and data obtained by this association since 1912, it is proven that outside of a very small number of fires caused by lightning and fires caused by railway locomotives, all fires could be prevented. It is far more essential to prevent forest fires than to detect and extinguish them. I would suggest that greater effort should be made in educating the people, especially those whose work is in connection with the lumbering operations, also the fisherman and hunter. The settlers in our territory during the past season caused four fires, burning an area of only 19 acres. We have no trouble whatever through this source, and the good results we believe were obtained through the educational efforts carried on by this association since several years. It will be remembered that only a few years ago the settlers were the cause of 100 to 185 fires a year and damaging large areas, and this, we believe, is sufficient proof to show the value of publicity in forest protection."

Few things come to those who wait for others to bring them.

PROGRAM OF THE TECHNICAL ASSOCIATION.

Since the Fall meeting of the Technical Association, eighteen applications for membership have been received. Thirteen of the candidates have been approved by the Executive Committee and admitted to membership, the latest being Gardner C. Derry, manager of the power apparatus department of B. F. Sturtevant Company, Hyde Park, Mass.

Several reports of unusual interest and value will be presented by standing committees. Reference has previously been made to the work of the Committee on Heat, Light and Power, which is planning a symposium on Pulverized Fuel and Steam Economy. The subject of Steam Economy is one that is almost unlimited in its scope. The leading paper in the symposium will deal with certain definite conditions in steam plants and discussions will afterwards be centered on individual problems in different mills. The chairman of this committee is Howard S. Taylor, of the Management Engineering and Developing Company, Dayton, Ohio.

An illustrated paper on water wheel testing, based on the results of twenty years' experience in testing water wheels in the grinder rooms of mills in the United States and Canada, will be presented by a New England expert, who has developed a simple scheme of showing results and indicating methods of operating to insure maximum efficiency.

Will Report on New Groundwood Process.

The Committee on Groundwood or Mechanical Pulp, headed by W. A. Munro, of the Wisconsin River Paper and Pulp Company, has conducted a searching investigation into the merits of the Hall process of grinding wood and a most suggestive and valuable report has been compiled from communications made by users or licensees of the process. The subject has been investigated from three angles, that of the grinder room, paper machine room, and press room. The resistance of paper made from Hall process pulp to strain in turning the angle bars of big newspaper printing presses forms part of the study, the committee being in possession of several interesting letters from the press rooms of the larger dailies.

Individual Papers in Prospect.

Among contributions to the session on scientific papers, one is promised from the Forest Products Laboratory, dealing with a new method of pulping in which the cooking time is shortened by preliminary impregnations. It is certain that contributions of reports and papers wll be up to the high standard set at previous meetings of T.A.P.P.I. A number of individual papers will be presented on such subjects as methods of drying paper on paper machines, the testing of crude rosin, measuring moisture in chips for cooking, facts and figures on power required for paper machines, etc.

Frank Sisson to Direct Entertainment at Banquet.

Arrangement for the annual banquet of the T. A. P. P. I., which is to be held at the Hotel Astor, New York, on Tuesday evening, April 12, are progressing satisfactorily. The entertainment features, musical, recitative, etc., will be in charge of Frank T. E. Sisson, of the Racquet River Paper Company, Pottsdam, N.Y. Mr. Sisson's ability as a musical director received the supreme stamp of approval at the last fall meeting of the association at Saratoga Springs. The entertainment at the annual meeting will not be on the same extensive scale as that given at Saratoga Springs, but it goes without saying that it will be highly enjoyable.

PULP AND PAPER NEWS

Announcement was made in Toronto this week of a new publication to be launched by Findlay I. Weaver, who for ten years was editor and manager of Bookseller and Stationer, put out by the MacLean Publishing Company. The new periodical is to be known as the Canadian Stationer and Book Trades Journal. Mr. Weaver had been a retail bookseller and stationer in Kitchener, Ont., and at one time was a reporter on the staff of the Toronto Mail and Empire.

I. H. Weldon, of the head office at Toronto, of the Provincial Paper Mills, Limited, has gone on a trip to Vancouver and other western points.

Mr. James Thompson, of Thompson & Heyland Company, who are large pulpwood contractors and lumber dealers, are extending their operations to the United States and will handle southern hard woods and pines in the Canadian market in addition to their pulpwood activities.

Mr. James Whalen, the well known pulpwood and lumber men from the west, was in Toronto for a few days last week. Mr. Whalen stated that the proposal of the Robert Dollar steamship interests to take over the British Columbia paper plants, may have a very important bearing on the development of this industry. T. W. McGarry, president of the Whalen Company, is now in British Columbia and is probably in touch with Mr. Dollar in the matter of the proposed arrangement.

Mr. F. Moines, of the Dayton office of the George H. Mead Company, of Dayton, Ohio, and Mr. R. I. Worrell, manager of the pulp sales department of the company, were in Toronto last week.

Plans to end the strike at the Beaver Board plant at Thorold are under way and it is hoped to bring them to a successful conclusion. A conference has been held between the strikers and officials of the company, with the result, it is believed, the strike will be brought to a close within a short time. The strike was called by the International Patternmakers Union because the men claim the Beaver Board Company refused to treat with them as a union in connection with wage adjustment. The strike has already cost an immense amount of money. For a time a hundred Mounted Police were on duty and there are now 22 members of the force there.

Middows, Limited, with a capital stock of $40,000 and head office in Toronto, has been incorporated to carry on business as paper merchants, wholesale stationers, printers, engravers, etc.

Mitchell Brothers Company, Limited, with a capital stock of $50,000 and headquarters in Toronto, has been granted a charter to carry on the business of general manufacturers and dealers in pulp and paper and the products thereof.

A charter has been granted to the Canadian Printing Company, Limited, of Sarnia, Ont., with a capital stock of $40,000, to engage in the printing and publishing business, as well as bookbinding, paper box manufacturer, stationer, etc. Among the incorporators are J. MacAdams, L. M. MacAdams, and Robert MacAdams.

The town of Hawkesbury, Ont., in which is located the large pulp mill of the Riordon Company, is seeking separation from the counties of Prescott and Russell.

B. M. Wyle, formerly crown timber agent for the Port Arthur district, before leaving Port Arthur for Toronto, expressed the opinion that reforesting was a great question for both the people and the Government of the country and said that townships unfitted for agricultural pursuits have been thrown open to settlement, while good agricultural lands have been left untouched by the plough. He feels that the settlers on the poor lands should be removed to the good lands and the land from which they have been trying to make a living, be reforested.

Mr. Bruce D. Clegg, who has been for some time in the pulp and paper machinery department of the Canadian Ingersoll-Rand Co, in Montreal, has been appointed manager of the Vancouver office of the company, 803-4 Birks Bldg., Vancouver, B.C.

Mr. Geo. F. Steele, Manager of the Canadian Export Paper Co. has gone to England on business for the company.

PULP AND PAPER LEAGUE BANQUET.

A very fitting wind-up to a successful season was given by the Pulp and Paper Hockey League last week at the Queen's Hotel, Montreal. One hundred and fifty players and guests assembled in the breakfast room at 7·30 and after a sumptuous repast were entertained by Jimmy Rice, who surpassed himself on this occasion. J. Beauchamp also contributed with songs that were much appreciated. The J. Eckstein orchestra supplied the music.

W. H. Aird, the president of the league was in the chair and in his remarks referred to the keenly-contested and clean hockey games that had been played throughout the season. Canadian Export Paper team well deserved to win, he stated, as they had played consistently throughout the series.

After thanking C. Howard Smith for his kindness in presenting to the league a magnificent cup, he called upon Mr. Smith to present same to the winners.

Mr. Smith in a few remarks praised the winners, saying that it had been his privilege to witness some of the games and was pleased with the good sportsmanship displayed by the different players.

Other presentations took place. Thomas Riddle received a percolator set and Jos. Riddle, a diamond platinum pin in recognition of the capable and efficient way they refereed the games for this league throughout the season. The league was fortunate in having the Riddle boys in the paper trade. Their reputations are well known in Montreal amateur sport.

Technical Section

REVIEW OF RECENT LITERATURE.

E-2. Determination of methyl alcohol in sulfite liquor. Papierfab., **18,** 611-5, (1920): Paper, 28, (Sept. 22, 1920). Abstracted by C. J. West. Heuser and Aschkenasi studied Dugré's and W. Konig's methods of detg. MeOH. Dugré's method consists in oxidizing the alc. with CrO_3-H_2SO_4 mixt., the MeOH giving CO_2 and the EtOH AcOH which is distd. with steam and titrated: the method was not found satisfactory. In the Konig method the CO_2 from the oxidation of the MeOH is absorbed in a suitable train and weighed. By using the method the following results were obtained.

	Sp. Gr. 15°C/15°C	% Alc. by Wt.	% MeOH	% MeOH of Total Alc.
I	0.8133	93.48	2.51	2.686
II	0.8125	93.77	3.12	3.32
III	0.8116	94.10	3.60	3.82
Swedish Alcohol.	0.81485	92.85	2.44	2.62
Swiss Alcohol . .	0.8113	94.19	3.76	3.99

—A.P.-C.

PATENTS.

K-6. Method of treating straw and the like for making paper pulp. J. Soc. Chem. Ind., **39,** 624A, (Sept. 30, 1920) U. S. patent No. 1,347,979, E. E. Werner, July 27, 1920. Straw or the like is treated with an excess of an alkaline soln., and, before further treatment, a portion of the soln. is expressed to reduce the alkalinity of the material to a given degree.—A.P.-C.

K-18-Bevelling millboard edges. Br. patent No. 144,-090, Wilmar Engineering Co. Ltd., Glasgow. Paper, 30, (Sept. 22, 1920). An improved contrivance of the type in which a rotary knife is mounted on a spindled journal in a frame ready to cut edges of card-board blanks held by a guide plate. The improvement consists in the provision of a grinder for sharpening the knives, and which is driven by the knife-grinding gear.—A.P.-C.

K-18. Improvements in corrugated cardboard. Br. patent No. 145,854, Wm. Grant Fiske, Director of Thames Paper Co. Ltd., Purfleet, Essex, England, June 29, 1920. Paper, 26-7, (Sept. 29, 1920). Corrugated cardboard, strawboard, and the like, is composed of a plurality of layers of boards which are corrugated prior to their becoming mutually immobile owing to the action therebetween of an adhesive when dried or set. The corrugating of the several layers whereof the completed board is built up may be effected before or after the adhesive is applied thereto and the corrugations of the layers may be effected individually or collectively, or some may be corrugated individually and some collectively, or the totality may be built up of layers which are corrugated as they are superimposed. In accordance with one form of the invention, webs of comparatively thin pliable board are fed from supply rolls and with the exception of the lowest web each is passed over mechanism for applying to the under surface thereof a layer of adhesive, and the webs are passed thence through a pair of rollers grooved peripherally so that there is a sinuous space therebetween, and the assembled webs are corrugated in the direction of their length. The pairs of rollers are arranged and shaped so that their action is progressive, the portions of larger diameter being more closely spaced lengthwise of the rollers and overlapping to a greater extent as the treatment proceeds, so that the corrugations are progressively deepened and the width of the webs is reduced. According to another form of this invention, the webs, instead of being assembled to constitute a board before they pass through the corrugating rollers just described, are corrugated transversely as they are superimposed—A.P.-C.

K-23. Varnishing and gumming paper. Paper, 30, (Sept. 22, 1920). The sheets of paper, etc., are carried on endless tapes through a longitudinal drying chamber having a continuous circulation of hot-air maintained by a fan; the outlet of the fan casing is connected to the external heater through which the air is forced to the chamber through a series of pipes to hoods or canopies forming the roof of the chamber, the top of which is wholly covered by a perforated plate. The pipes may be controlled by dampers; and the plate divided into sections corresponding with the canopies.—A.P.-C.

K-23. Machine for making imitation hand-made paper. Paper, 27, 32, (Sept. 15, 1920). An invention to produce sheets of paper in imitation of hand-made paper of any required size or shape and automatically to deliver the sheets without the aid of hand labor. A wire cloth covered drum or cylinder is employed on the surface of which are formed the moulds and the drum is caused to rotate beside a pulp containing trough in the manner of the fountain roller of a printing press. The sheets are withdrawn on to an endless felt from which they are taken on to a conveyor and delivered. —A.P.-C.

K-0. Machine for delivering predetermined lengths of paper, tape, etc. Paper, 30, (Sept. 22, 1920). —A.P.-C.

K-0. Machine for the manufacture of paper excelsior. Can. patent No. 197,583, I. HOFFMAN, Assignor of a third interest to K. KREIZER, Ford City, Pa., U.S.A., Feb. 24, 1920. Claims allowed 15.—A.P.-C.

K-0. Use of paper in the manufacture of calcium cyanamide. Can. patent No. 203,558, The American Cyanamide Co., New York City, Assignee of GEO. E. COX, Niagara Falls, Ont., Aug. 31, 1920. The process of producing $CaCN_2$ from $Ca(CN)_2$ which consists in introducing into a cyanamide furnace a suitable removable form, inserting in said form a sleeve of perforated paper, charging finely ground carbide into the sleeve, covering the mass of carbide with a heat insulating cover, removing said form, and proceeding with the nitrification of the carbide. Claims allowed 5. (See also U. S. patent No. 1,315,678, Chem. Met. Eng., **22,** 89, Jan. 14, 1920.)—A.P.-C.

L-4. Paper box blank. Can. patent No. 202,752, H. B. SMITH, Brooklyn, N.Y., U.S.A., Aug. 10, 1920. Claims allowed 32.—A.P.-C.

L-4. Apparatus for manufacturing seamless envelopes. Can. patent No. 204,561, TORAKICHI UMEDA, No. 2233 Tennoji-Mura, Prefecture of Osaka, Japan, Oct, 5, 1920. Claims allowed 3. (Same as Fr. patent

No. 502,185, Papier, **23**, 103-4, May, 1920; Pulp & Paper, **18**, 926, L-4,, Sept. 2, 1920.)—A.P.-C.

L-4. Process for compacting, batting and felting cellulose fibrous material out of liquids. Can. patent No. 204,656, WM. F. BOYSEN, Buffalo, N.Y., U.S.A., Oct. 12, 1920. The process of forming articles of fibrous material which consists in depositing a liquid diffused pulp onto a perforated former drawing the liquid down through and compacting said pulp on said former by means of a suddenly applied vacuum below said former, the application of a vapour re-agent drawn down though said pulp by said vacuum, depositing an adhesive compound on to said compacted pulp and drawing said compound through said pulp by a further application of a suddenly applied vacuum whereby pulp is cemented. Claims allowed 7.—A.P.-C.

L-4. Envelope making machine. Can. patent No. 204,-899, FRED. J. PARKS, New York City, Oct. 19, 1920. Claims allowed 5.—A.P.C.

L-5. Production of hydrated derivatives of cellulose. Can. patent No. 204,250, C. F. CROSS and E. BEVAN, London, England, Sept. 28, 1920. A process of treating fibrous cellulose which consists in subjecting the cellulose to the action of alkaline lye of strength between 6 and 11% (NaOH) and then to the action of CS_2, and finally washing the product. As a new product, hydrated fibrous cellulose having a thickened cell wall and an exaggerated central canal defined by symmetrical sinuous outlines. Claims allowed 7.—A.P.-C.

L-5. Process of dissolving cellulose. U. S. patent No. 1,348,731, Z. OSTENBERG, Assignor to INTERNATIONAL CELLULOSE CO., Aug. 3, 1920. J. Soc. Chem. Ind., **39**, 624A, (Sept. 20, 1920). Cellulose is dissolved in a highly-coned. HCl in which a portion of the HCl has been replaced by 1½ times its quantity of concd. H_2SO_4 below 50°C.—A.P.-C.

L-5. Treatment of pulp with thiocyanates. Can. patent No. 203,364, The Manchester Oxide Co. Ltd., Assignee of R. H. CLAYTON and H. R. WILLIAM all of Manchester, and of J. HUEBNER, Chadle Hulme, Chester, all in England, Aug. 24, 1920. The process of treating a cellulose substance in the production of solutions and viscous or gelatinous bodies or masses thereof, which consists in treating the cellulose with a mixt. of a soln. of thiocyanates and a soln. of a salt which does not adversely affect the action of the thiocyanates and which may itself have no dissolving action upon the cellulose; or in treating it with an acidified soln. of thiocyanates. Claims allowed 4. Same as Br. patent 124,-979, U. S. patent No. 1,333,465, Fr. patent No. 500,504. See Pulp & Paper, **17**, 851, (Oct. 2, 1919); **18**, 953, K-20, (Sept. 9, 1920).—A.P.-C.

L-5. Paper feeding device for wrapping machines. Can. patent No. 197,991, R. LEUMANN, Lausanne, Switzerland, March 9, 1920. Claims allowed 4.—A.P.-C.

L-6. Composition for coating airplane and similar fabrics. Can patent No. 198,265, Pratt & Lambert Co., Buffalo and New York City Assignee of H. Ross, Buffalo, N.Y., U. S. A., March 16, 1920. 100 parts of acetyl cellulose and 40-60 parts triphenyl phosphate are dissolved in a suitable solvent. Claims allowed 12. —A.P.C.

L-7. Manufacture of viscose filaments. Can. patent No. 203,160, E. BRONNERT, Dornach, Neidermorschweiler near Mulhausen, Germany, Aug. 17, 1920. A process for the manuf of glossy filaments or threads from crude viscose by means of warm mineral acid, characterized in that crude viscose which has stood abt. 8 days or more at a temp. of 15-20°C and has been filtered (preferably several times) is expressed into warm 20% H_2SO_4 of a temp. of abt. 40°C, wound on suitable spools, and thereupon or afterwards washed with warm water and dried in a known manner under tension and desulferized substantially as described. Claim allowed 1.—A.P.-C.

L-7. Conditioning paper for subsequent spinning. Br. patent No. 144,057. H. Wood, Bolton, England. Paper, 30, (Sept. 22, 1920). Patent issued covering a machine which simultaneously cuts and conditions paper ready for spinning. The conditioning liquid is applied during the cutting, and varies in quantity as the diameter of the paper strips on the roll increases.—A.P.-C.

K-7. Automatic continuous mixing system for paper stock. EDWARD J. TRIMBEY. Paper, 13-4, (Sept. 22, 1920); Pulp & Paper, **18**, 965-6, (Sept. 16, 1920). Groundwood and sulfite are furnished continuously either by gravity or by pumping, to their respective compartments of a double vat; each compartment is provided with an overflow dam and a float valve of special design, for maintaining a const. level in the compartment regardless of the rate of flow of the stock. Mounted in one end of this double vat is an outlet spout communicating with both of the groundwood and sulfite compartments and so arranged with a sepg. partition and an adjustable top that the cross sectional areas from the outflows of groundwood and sulfite will give the desired proportions of each and at the same time the total flow can be varied to meet the changing requirements of the paper machines. In addition to being adjustable for both total vol. of flow and relative proportions of groundwood and sulfite this outlet spout has valuable regulating features which automatically compensate for minor variations in the consistency of each. With const. head and varying vel. and consistency, by proper design the decrease in vel. can be made to counterbalance the increase in consistency so that within a given consistency range there will be a const. rate of discharge of dry stock per unit of time. It is expected that the stock coming to the vats of the continuous mixing system will be controlled by consistency regulators but this automatic compensating feature is of value as a second control to smooth off temporary variations and to act in cases of emergency. The other ingredients, clay, color, and alum, are supplied in soln. or in liquid form to receiving vats in which a definite head is maintained by means of overflow dams. The amt. of chem. soln. is exactly proportioned to the amt. of stock by means of a double overflow weir having a separator between the 2 weirs. The discharge from one weir goes into the mixt. of sulfite and groundwood, and that from the upper weir joins the overflow from the upper vat and is returned to its supply tank. The separator between the 2 weirs is mechanically connected to the mechanism for raising and lowering the adjustable tops of the stock spouts for groundwood and sulfite in such a way that when the pulp discharge ports are closed the weir discharging into the pulp mixt. is also closed and the liquid all goes out at the overflow. As the stock ports open the separator is automatically shifted to keep the length of the weir always proportional to the area of the stock ports. This continuous mixing system is not limited to newsprint mills alone, but can be adapted to any mill where the furnish is entirely in the form of soft stock, or where it can be reduced to soft stock by means of a pulper or shredder, and it is necessary to add definite amts. of chemical or liquids.—A.P.-C.

UNITED STATES NOTES

The machine shops of the Bagley & Sewell Company, manufacturers of paper making machinery, are still running day and night to meet the heavy demand for equipment ordered for the industry all over the country. While the concern has been carrying on work on this basis for several years, paper men in Northern New York regard as a most hopeful sign the fact that orders continue to pile up for the Bagley-Sewell people without any indication of a letup. The company is one of the few Watertown industries to be unaffected by the present business slump. While many men in other shops have been thrown out of employment, and are seen daily on the streets anxious to get work, the employes of the Bagley & Sewell Company are busy. It is said that the company already has on hand orders sufficient to require night and day operation for more than two years to come were no more orders received in the meantime.

L. M Alexander, of the Nekoosa-Edwards Paper Company, Port Edwards, Wis., and W. J. Raybold, vice-president and treasurer of the B. D. Rising Paper Company, Housatonic, Mass., will represent the American Paper and Pulp Association at the Ninth Annual Meeting of the Chamber of Commerce of the United States. Mr. Alexander, as National Councillor of the American Paper and Pulp Association, is automatically entitled to go as a regular delegate. Mr. Raybold's selection as a delegate was made by Geo. W. Sisson, Jr. president of the Association.

The Union Bag and Paper Company reports for 1920 net earnings, after charges and taxes, of $3,474,926, or $23.20 a share on the $14,977,850 common stock outstanding. In 1919, the earnings totalled $1,680,619, or 16,81 a share of the $10,000,000 stock then outstanding. Net earnings were 5,046,300 and depreciation charges $428,173. Interest charges and taxes exceeded $1,000,000 and dividends of $1,081,896 were distributed, leaving a surplus for the year of $2,393,030. After making surplus readjustments, setting up a reserve for dividends and writing off from surplus the $4,977,850 stock dividends paid during the year, the total profit and loss stood at $1,874,305.

The Post Office Department, as an economy measure, is using for official correspondence a huge stock of old purple 3 cent stamped envelopes. Finding a large supply of these envelopes on hand, the postal officials sent them all back to the printer, who imprinted the penalty warning across the stamp as a sort of cancellation. The envelopes are now being used for official correspondence. Even the envelopes upon which were printed the return address for various banks and other business establishments during the war have been treated in the same manner.

The Carton Club of Chicago, whose membership is made up of all the prominent Chicago paper box manufacturers, recently held its annual meeting at the Traffic Club, Chicago. The gathering proved to be the largest yet held by the organization. Optimism as to the future outlook in the trade marked the talks of most of the speakers.

A marked increase in operations at the mills in Holyoke, Mass., is reported, particularly at the plant of the American Writing Company. Officials of this concern state that the week ending, March 26 has been the busiest experienced so far this year.

Damage, estimated at about $25,000, was sustained through a fire which last week destroyed the plant of the Russell Product Company, South Camden, N. J. Stock and machinery were almost entirely destroyed, but the loss is fully covered by insurance.

The Boston Paper Trade Association at its annual meeting and banquet, held recently at the Algonquin Club, Boston, re-elected Herbert W. Mason president of the organization. Other officers chosen for the ensuing year are: John A. Andrew, first vice president; Alfred Leeds, second vice president; T. H. Casey, treasurer, and W. B. Stevenson, secretary. Alvin W. Simonds, president of the Simonds Manufacturing Company, Fitchburg, Mass., one of the principal speakers at the affair, chose as his topic "Business and Industrial Conditions." Mr. Simonds expressed himself as being highly optimistic as to the future of business, and although his attitude since the day of the armistice had been a decidedly pessimistic one.

With the signing of an agreement by the Bryant Paper Company and the Kalamazoo Union of the International Brotherhood of Papermakers, and the acceptance by the employes of the Vegetable Parchment Company of a revised wage scale, the likelihood of a strike over the wage question in the Kalamazoo Valley has probably been averted. The employes of the Bryant Paper Company decided to accept a cut of 16 2-3 per cent for all grades of workers, both union and non-union, from now until May 1, when the agreement for the following year will be reached.

Wage re-adjustments have been effected in the paper mills of Crane & Co., Pittsfield, Mass. A wage reduction of from 10 to 15 per cent was announced by the Cranes and Byron Weston last Friday, to be effective beginning March 28.

The S. D. Warren Company, Westbrook, Mass., announced a reduction in its working schedule to a five-day week, beginning April 2, until further notice. Business conditions are said to have necessitated a curtailment of production.

Protesting against a wage cut amounting to approximately 17½ per cent, most of the 500 employes of the Northern Paper Mills, Green Bay, Wis., quit their jobs last week. At the present writing the differences remain unadjusted, the strikers claiming that the plant is paralyzed due to the walkout. The company officials, on the other hand, hold that a large number of the employes have returned to work and that the mill will be running at normal capacity within a few days. Perry S. Wagner, general manager of the mill, in a statement to the workers and to the public, insists that the reduction was not made because of lowering living costs but because the mills could not continue operating unless production costs are reduced. The strike is the first this year in Wisconsin called to protest against wage cuts.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, March 26.—Although there is a good deal of optimism concerning the future of the pulp and paper trade the fact remains that a number of undertakings planned for this spring will not be gone on with the present time. One of the leading officials of a big Canadian pulp and paper mill told the Pulp and Paper Magazine that his company had decided on a policy of retrenchment as far as expansion went and that the outlook would have to present a more certain aspect before the program of improvements and additions that had been planned for the present season would be gone on with. This caution marks the trade generally although in many cases the original plans for expansion are proceeding in the conviction that the era of the big business is only temporarily suspended. It is confidently expected that the trade is going to come back strong and while some of the mills are deferring their enlargements as a result of a natural hesitancy, due to the quiet period, it is generally believed that it will be only a matter of a short time before the big improvements planned some months ago will be in full swing. In the meantime the pulp and paper trade is undoubtedly dull. Most of the mills are running light and it is not easy to dispose of paper products, despite the activities of salesmen. In some lines, however, there has been a distinct improvement, jobbers reporting a better demand and a bigger bulk of small orders, although big business is still unprocurable. Generally speaking there is an ever-increasing optimism in the future of the trade although business is undeniably hard to get and a stable basis for pulp and paper transactions has not yet been reached.

Pulp.—A prominent dealer in Montreal says there is no market for pulp and is of the opinion that when a mill, not receiving pulp on contract, gets an order for paper, it buys a car or two of pulp. Ground wood can probably be had for $40; news grade sulphite for $70-$75; bleached for $120, and kraft for $80.

Pulpwood.—A large pulpwood contracting firm informed the Pulp and Paper Magazine that all the mills were supplied with wood at the present time and no one is in the market for the commodity. Ontario shipments are well cleaned up and very little unsold wood is on hand. The 1922 season will open in May and what is being shipped out now is on the present year's contracts. New contracts will not be made until after May 1, and in the meantime there are no definite market prices. In the opinion of the contractor referred to present appearances indicated that the coming season's price will be at least ten per cent under those prevailing during the past season.

Coated Paper.—Coated paper mills report a fairly good volume of business and most of them are busy. A recent reduction of between eight and nine per cent leaves these quotations: No. 1, $17.85; No. 2, $16.85; No. 3, $16.10; tints, $18.10.

Bonds.—Sulfite bonds are quoted at 16½ cents for white, tints 17½ cents, and colored at 18½ cents, which list represents a recent reduction of 2 cents per pound. The cheapest writing paper is 15 cents per pound.

Book Papers.—One manufacturing firm gives the following prices on book papers: No. 1 book, $13.50; No. 2, $13.35; No. 3, 12½ cents, with M.F. book half a cent lower. Book papers are down a cent and a half.

Tissues and Toilets.—Tissues and toilet paper manufacturers report that business has picked up considerably during the past couple of weeks. The mills are busy and for the most part are running full. One mill reports that it has orders for two months ahead and that the outlook for the trade is very bright.

Rag and Paper Stocks.—Reports from paper manufacturers using blue cotton cuttings indicate that the operations have been decreasing rather than expanding so that there has been little need for mills to enter the market for these cuttings. There have been rumors of actual sales of new cotton cuttings made at far below the prices quoted, and no doubt smaller lots can be bought even cheaper from some of the smaller dealers. The most optimistic dealers in old cotton rags have been unable to see any change for the better in this market. In fact the demand from consuming mills has been so small that the tone has continued very uncertain, some descriptions showing further declines in price. Mills pay little attention to offerings of rags, and most dealers have not been looking for business as mills come into the market for what little they want at very low prices. The concensus of opinion is less optimistic as regards price advances in the future on account of the continuing lack of consuming demand in most quarters. The situation is sized up as very uncertain. The fact that at present prices rag collection is bound to continue small, and that prices offered for foreign rags are not attractive to overseas sellers, is not lost sight of, but the weak position of the consuming mills is the overshadowing factor. Nominally quotations are about the same as last week, but there have been reports of fairly large lots bought at very much lower figures. In the opinion of some of the oldest members of the paper stock trade the present market is the quietest they have experienced. Mills have continued out of the market, and only occasional small-sized orders are given, and then, such demand as there is, is directed towards a few grades only. Dealers, who are usually in the market for miscellaneous cars from country points, absolutely refuse to quote prices, and the larger packers claim to be having difficulty in disposing of their local collections without going into the market to buy outside packing. Buying by board manufacturers has been light. Prices have been easier on No. 1 mixed papers, and miscellaneous packings of this grade have been impossible to sell. Mills have been firm in their demand for repacked stock and the dealer who fails to put up material properly is having considerable difficulty in moving his stock. Shavings showed another sharp drop which was followed by newsblank and manila cuttings. Old kraft papers are again weaker, and taking it altogether the general tone of the waste paper market is anything but encouraging.

The following list shows a few reductions. Prices are per cwt., F.O.B. Toronto:

	F.O.B. Toronto.
No. 1 white envelope cuttings	$ 3·50— $ 4·50
No. 1 soft white shavings	3·00— 3·25
White Blanks	1·50— 1·60
Heavy ledger stock	2·75— 3·00
No. 1 magazine	1·65— 1·85
No. 1 book stock	1·25— 1·45
No. 1 manila cuttings	1·50— 1·60
No. 1 print manila	·75— ·85
Folded news	·65— ·75
Over issue, news	1·00— 1·15
Kraft	1·60— 1·80
No. 1 cleaned mixed papers	·35— ·45

NEW YORK MARKETS.

New York, March 26—(Special Correspondence)—The present week has been a quiet one in the paper industry. Buyers have continued to operate in very cautious fashion, and while it is true that the movement of some grades of paper has broadened slightly, the situation as a whole displays no appreciable improvement. Publishers, papeterie manufacturers, box makers and other large consumers of paper and paper board still evince an attitude of indifference in respect to the absorption of supplies excepting, of course, such supplies as they immediately require, and current buying is confined almost exclusively to small amounts of paper directly needed.

Reports from mill centres tell of most papermaking plants operating on materially reduced schedule. Manufacturers are pursuing a policy of producing paper only against actual orders, as most of them have ample stocks of their product on hand to fill the bulk of orders coming in. The greater part of these stocks are paper made from high-priced raw material, and manufacturers obviously are desirous of liquidating holdings before resuming production on a more normal scale.

An encouraging feature of the market situation is that jobbers' stocks are at a minimum. Taking New York, which is probably the largest paper distributing centre of the country, as an example, it can be stated without fear of contradiction, that local jobbers' shelves are practically bare of paper. For some months past jobbers have bought only when receiving orders from customers and have purposedly reduced their holdings to as low a point as possible and still be able to take care of the small commitments of buyers. The opinion is expressed by one of the leading jobbers in this city that if demand for paper should expand and jobbers should resume buying from mills in something like usual volume that it would not require more than a month for mills the country over to completely liquidate their stocks of finished paper. This means, of course, that as soon as consumers commence to increase their buying, manufacturers will almost immediately feel the effects of the improved market condition because jobbers will be obliged to go to mills to obtain the paper necessary to cover their orders.

The newsprint situation is unchanged. If anything, spot stocks are increasing and quotations on prompt deliveries display an easing tone. Offerings of roll news for spot shipment at around 5 cents per pound at mills are quite numerous, and there is every reason to believe that the reports of sales down to 4.50 cents are true. The Federal Trade Commission's report on the newsprint industry for February shows that mill stocks increased during that month notwithstanding that production was cut down considerably. The contract basis on newsprint continues to be between 5 and 5.50 cents f.o.b. mills for the second quarter of the year, with the largest producing company quoting the higher figure.

The book paper market is quiet and lacking in feature. Manufacturers are maintaining contract prices at last announced levels, it being their contention that they are taking a loss on such business because of the fact that the paper involved is being made from raw material contracted for at high costs, but signs are not wanting that spot lots of book papers are being offered at surprisingly low figures. The wrapping paper situation also is quiet. Routine business is passing but there is no concerted movement of supplies and mills in general are in want of business. Tissues are in light demand, and are quoted at a basis of around $1 per ream for No. 1 white at mills.

Fine papers are sought only in small lots. Jobbers are buying sparingly as their needs arise, and demand from consumers reflects the quietness prevailing in the job printing trade. Quotations on writing and bond papers are very uncertain and on a broad range. There is no such thing as an established price basis as mills are changing quotations as the occasion warrants in the hope of securing the business.

A little better demand is noted for some kinds of box board. Folding box boards are in increased call and corrugating board for fibre shipping containers is said to be moving in larger volume. Chip and news board, however, continue quiet. The set-up box trade is dull and box manufacturers are buying board merely to cover immediate requirements. Quotations on plain chip range between $30 and $35 per ton at mills, and on filled news board at $35 to $40.

GROUND WOOD.—There is a lack of important trade activity in ground wood pulp. Consumers are coming into view off and on to absorb small lots needed to fill in contract deliveries, but the aggregate movement of mechanical pulp, other than to contract customers, is of slight consequence. It is difficult to say exactly what constitutes market values. Sales of prime spruce ground wood have been reported at $40 per ton at grinding mills, and there have been rumors of purchases at even below this level. Board mills are doing little or no buying, while newsprint manufacturers are confining their purchasing operations strictly to minor quantities of pulp actually needed.

CHEMICAL PULP.—The market for chemical wood pulp continues to display a waiting condition. There are few important buyers in sight, and the scattered transactions accomplished involve in the aggregate no sizable amount of pulp. Consuming mills are at present more intent on using up stocks on hand and pulp coming in on contract than in augmenting their holdings, and are refusing firmly to buy regardless of how attractive are the prices named by sellers. It is reported that one of the leading domestic producers of bleached soda is offering this grade of pulp at 5.75 cents per pound at the producing mill, which, if true, represents another fall in prices. Bleached sulphite of domestic origin is quoted at 6 to 6.50 cents, No. 1 domestic unbleached sulphite at between 4.25 and 4.50 cents at shipping points.

There is very little foreign pulp coming into the United States. As an apt illustration, the Federal Trade Commission's review of the newsprint market for February places importations of chemical wood pulp in January at 25,872 net tons, or 32,161 tons less than was imported in the same month of 1920. Im-



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INQUIRIES SOLICITED

porters are buying in Scandinavia almost solely against direct orders from mill customers and are bringing in little or no pulp on their own account.

RAGS.—Papermaking rags are moving toward mills in but small quantities. Consumers are holding definitely aloof as buyers unless in immediate need of stock and even then are absorbing only limited amounts required to fill in stocks at hand. With the spring commenced, dealers in numerous cases are attempting to move present holdings in preparation for incoming collections during the next several months, and there is a decidedly easy tone to values. In fact, it is questionable at just how low some grades of rags can be bought in certain quarters. Prices today depend in large measure on how desirous the seller is to liquidate stocks or how keenly the buyer needs rags. Some packers are holding back in trying to market rags in the belief that more favorable conditions will exist later on; others are in that mood where they will accept almost any prices within reason they are offered so long as they can rid themselves of rag holdings.

Roofing rags continue to constitute the most generally sought description of stock. Felt mills are buying cautiously but are, on the whole, absorbing fair amounts of satinets and strippings. No. 1 roofing is selling at $1 to $1.10 per 100 pounds f.o.b. New York, and cloth strippings have fetched a little higher than these figures. Old whites are in demand here and there, with quotations ranging around 7.50 cents a pound for choice No. 1 repacked and at about 6 cents for No. 1 miscellaneous packing. Thirds and blues are little wanted and are quoted at 2.50 to 2.75 cents at shipping points for repacked and 1.75 to 2 cents for rough packing. New cuttings are gradually easing lower in price.

PAPER STOCK.—The present week has been an exceedingly quiet period for the paper stock trade. Consuming mills have done little buying, evidently having their requirements covered for a time, and prices on several grades have receded to new low levels. Offers by dealers of No. 1 hard white shavings at 3.50 cents per pound f.o.b. New York and of soft white shavings of No. 1 quality at 2.50 cents have met with scant response, and reports allege that shavings can be bought at another quarter of a cent below these quotations. Old books and magazines have dropped to about 1.10 cents at shipping points, while old No. 1 kraft paper is offered fairly freely at 1.65 to 1.75 cents without attracting many takers. Folded newspapers command only in the vicinity of 50 cents per 100 pounds New York and No. 1 mixed paper has sold to mills down to 35 cents f.o.b. this city. The market in its entirety displays a weak undertone, and indications are that the only reason values are not breaking faster than they are is that prices are already so low that packers derive practically no profit in collecting and grading waste paper at ruling market levels.

OLD ROPE AND BAGGING.—Paper manufacturers are buying little old rope and bagging. Occasional orders are placed for old manila rope at a price basis of 4 cents per pound, or slightly less, at shipping points for No. 1 rope, but there is no concerted movement in any direction. Scrap bagging is offered freely at 1.25 cents a pound and less and is finding few buyers.

INDEX NUMBERS OF PAPER PRODUCTION COSTS

No. 9
February 1st, 1921

ISSUED BY THE AMERICAN WRITING PAPER COMPANY, HOLYOKE, MASS.

	1921		1920							1919	1918	1917
	FEB. 1	JAN. 1	DEC. 1	NOV. 1	OCT. 1	SEPT. 1	AUG. 1	JULY 1	JAN. 1	JAN. 1	JAN. 1	JAN. 1
WOOD PULP	285	327	324	329	316	308	283	274	226	218	206	205
RAGS	219	227	269	311	323	321	311	315	253	211	140	136
PAPER SCRAP	216	220	258	324	416	423	407	416	271	190	150	166
SUPPLIES	231	225	256	293	297	296	292	247	181	178	178	138
CHEMICALS	206	220	229	252	256	260	260	273	223	191	179	188
ALL MATERIALS	247	271	288	312	317	313	298	290	230	207	180	175
LABOR	276	276	276	276	276	276	276	276	225	197	168	130
MATERIALS and LABOR	**256**	**272**	**286**	**305**	**308**	**305**	**293**	**287**	**229**	**205**	**178**	**166**
A. W. P. Mill Brand Bonds, Ledgers, Covers and Flats	257	299	299	299	299	287	287	287	258	207	167	166

For more complete information, see our report issued October, 1920. In the last line we give, for purposes of comparison, index numbers of the average selling prices of about twenty of our mill brand lines. In every case, 1913 prices are taken as 100.

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OF CANADA

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VOL. XVIX. **GARDENVALE, P. Que., April 7th, 1921.** **No. 14**

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal,
'Phone Uptown 7773.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

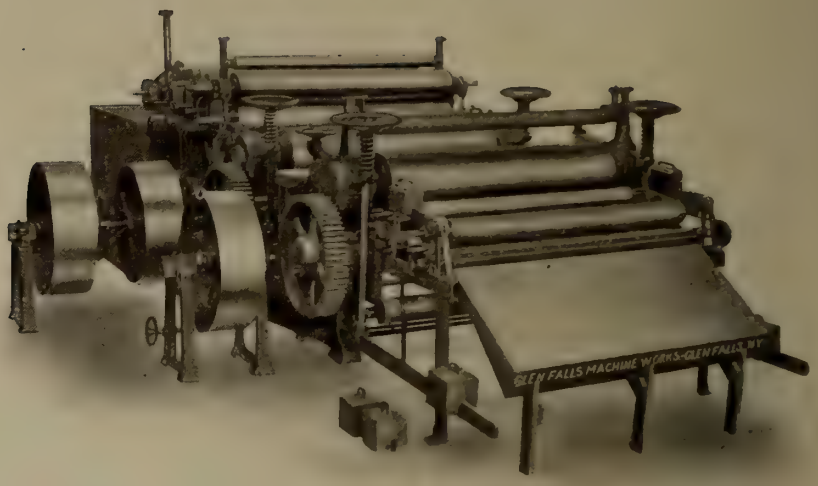
J. NEWELL STEPHENSON, M.Sc., Editor.

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EDITORIAL

THE COMMISSION OF CONSERVATION.

We had the misfortune once, in the course of a track race to tumble. This had two effects. It distracted our attention from the matter in hand and the brief interruption made it impossible to recover the lost position. The Commission of Conservation is to be abolished, or, at the least, its activities are to be temporarily suspended. The Commission of Conservation was making excellent progress along certain important lines of work in connection with the conserving of Canada's natural resources and this interruption of progress, if actually put into effect, will never be made good. For one thing, the spirit of an enthusiastic organization was considerably dampened even by the rumors that the work might be discontinued. The breaking up of the organization will mean that the members will establish themselves elsewhere and, once bitten, are not likely to return.

The effect of dropping the Commission will have a wide effect on several lines of research work in Canada because members of the various branches have been co-operating so cordially and smoothly with other organizations working along similar lines. This is especially true with regard to the forest study wherein the foresters of the Commission have been working side by side with a number of the large pulp and paper and lumber companies. We could fill an issue of this magazine with instances of valuable work which has been accomplished through such co-operative effort. We are sure that this early demise of a perfectly healthy organization will be a severe setback to forestry progress in Canada. A number of investigations have been planned out and carried far enough to show that results of the utmost importance and significance are certain of attainment and a number of difficult forestry problems are well on the way to solution. It will surely be a great pity if this work is allowed to slip back and the ground, which was won at such expense of energy and money, lost for want of continued activity.

The principal reason for abolishing the Commission is the desire of the Government to keep more nearly within its means. Certainly this is a laudable desire and if there are no other items of expense that can be eliminated then there will be regret without censure for this particular action. It does seem, however, a great pity that the momentum acquired during these past few years of fruitful activity should be sacrificed. It would seem far more desirable to curtail expense in a number of departments by concentrating efforts on work of a narrower scope so as to maintain the organization. This seems especially true when a government department is tying together important research work in several provinces, carried on by several agencies for the purpose of preserving one of Canada's principal natural resources.

In the event of its being finally decided that the Commission of Conservation must go it is our earnest recommendation to the Government that the forest growth studies of the Commission be continued by the Council of Scientific and Industrial Research. For this purpose the members of the Commission who have been doing this work could be attached to the staff of the Central Research Institute which is being established. This institute will have, among other functions, the purpose of investigating problems relating to the utilization of wood and it seems rather like building on the sand to investigate very deeply into such matters if the only source of the material is to be entirely neglected with the very imminent danger that the supply of raw material fail and investigations of processes dependent thereon consequently come to nought.

FOREIGN TRADE.

Some countries and some peoples seem to be predestined to manufacture about all the goods required for home consumption, and then some. The surplus must be sold in non-manufacturing countries or in a competitor's home market. Even in a country where a product is made it is strange how much foreign goods can be sold. This is partly due to the demand for special grades and partly to supplement domestic supplies. For instance, United States mills make all kinds of paper, but that country imports large quantities from other sources, partly, as in the case of newsprint, because there is not enough made at home, but in other cases, because some imported papers have peculiar properties which enable them to compete with the domestic product. There are also circumstances which sometimes enable the foreigner to undersell the local product. Sometimes this ability is found to lie in the marketing of an inferior article.

The case is somewhat different where several competitors meet in the same market which is foreign to both. Such meetings are frequent with nations that export a large proportion of their product. Great Britain, Germany and the United States have in past years been the principal rivals in such markets. More recently Japan has become a factor and in certain lines, Canada is becoming more important as a source of important manufactured products. During the war, when European countries found it difficult to manufacture material in excess of what was required for military operations, and when it was quite as difficult to trans-

port what was manufactured, customers in South America, Australia and other far away places had great difficulty in finding supplies. As the United States did not become involved in the struggle until British plants where almost entirely devoted to war work, it was natural that customers of both German and British concerns should turn to America for placing their orders. In fact, orders flooded in to American exporters so rapidly that many manufacturers were practically submerged with business. Many new connections were made with little or no effort and a large volume of business was done. About the only limit was the available shipping space and the capacity of the producing plant. The sentiment against Germany and German made goods was a large factor in the rapidity with which many foreign importers changed their affiliations.

During the period of stress the competition was mostly among buyers for the restricted amount of material available, but this has all changed during the last two years. Even before the end of the war was definitely in sight, British manufacturers in co-operation with Government agencies, were planning a vigorous resumption of effort in the foreign field. British industry could not live without export connections. The well laid plans of export trade associations were put promptly into effect at the first opportunity and indications point to a rapid recovery of British trade in overseas markets. Where before the war it was a triangular contest with Germany, England, and the United States fighting it out on the far away commercial front, it is now settled down in most lines to a matched race between the English and the American. Well informed authorities intimate that the rapidity with which the English manufacturer and merchant has recovered his wind has been a great surprise while the easy business without strenuous competition for several years has somewhat diminished the aggressiveness of the Yankee salesman. The American, however, does not readily admit defeat and it is entirely unlikely that there will ever come the time when either of these rivals, whose friends at home and whose governments are so entirely friendly and cordial, will ever step out of the ring.

While the giants are busily competing for first honors, there are other aspirants for foreign business coming into the field. In some lines of manufacture, Canadian producers are not to be overlooked. Canadian goods as well as products from the United States found acceptance and favor in many countries in which they were strangers before the war. We are not likely to be contradicted in saying that many connections made by Canadian firms are less likely to be disputed by the British than in cases where the American or Jap has taken over British, German or Scandinavian customers.

One point which is most prominent in reference to development of foreign trade is the necessity for keeping after it and of ensuring the customer with a definite supply of goods that are desired. At the present time markets are dormant almost the world over, but it has been noticed that the countries which were first affected by financial troubles and commercial dullness, have already begun to show signs of revival, the period having lasted approximately eighteen months. If this tendency spreads and recuperation is general at about the same rate, we may expect a fair amount of foreign business to be coming in. Connections made, therefore, by Canadian firms during times of difficulty and kept fresh by the best possible service should bring satisfactory returns in the near future.

"TRADE ASSOCIATIONS."

The relation of the trade association to the trade journal is only one of the many live points discussed in the new book, "Trade Associations," by Emmett Hay Naylor, Secretary-Treasurer of the Book Paper, Cover Paper and Writing Paper Manufacturers' Association, just off the press. Mr. Naylor is not only widely known in the paper industry through his work as secretary for these Associations, but is nationally known in the trade association field as president of the American Trade Association Executives, and his new book which has been published only after thorough study and long and careful preparation therefore carries a double stamp of authority.

He discusses the efforts of some association to publish their own trade journals, and adds: "This at least may be said: When a trade association undertakes a publication of any considerable size, for instance a monthly magazine, it may expect innumerable difficulties. The ideal arrangement in an industry is to have one or two good publications issued independently by private parties, and then for the association to have its own regular bulletin, of whatever size may be convenient, but issued as a matter of intimate information to the members each month, and in no way dependent upon subscriptions or advertising."

Mr. Naylor's book, however, goes much more deeply than this into the general work and field of the trade association, and not the least importane portion is, in view of governmental activities in industrial fields, his discussion of the legal scope of an assocation, and particularly an avoidance of any attempt to even evade the law.

The value of the association to its industry and to the general public welfare is well analyzed, in the earlier chapters, and then goes into association routine, commercial and industrial functions, service activities, such as informative and protective, cost systems, statistical information, and concludes with two chapters on fair prices and the association and the law.

The entire book, which includes legal reference and a list of trade associations, is replete with references to the paper industry, and its associations, as examples of various means of providing service to association members.

WORLD TO ENLARGE PULP MILL.

The New York World Publishing Co., Park Row, New York City, has plans under way for enlargements in its mills at St. George, New Brunswick, recently acquired from the St. George Pulp Co. It is proposed to increase the capacity from 30 to 100 tons of pulp daily. The company is also planning for the erection of a new pulp mill in the vicinity of Ogdensburg, N.Y., and will call for bids on this latter work early in the spring.

The Purification of Water by the Continuous Blow-Off Method

By G. PARIS.

(Abridged translation prepared for the "Pulp and Paper Magazine" by A. Papineau-Couture, from "Chimie et Industrie", **4**, 722,730, Dec. 1920.)

The generation of steam, like so many other industrial processes, has been profoundly affected by the war, and requires to be watched more closely than ever before. The cost of the equipment required for the production of steam and for its transformation into mechanical energy has followed the general trend and has risen tremendously. The quality of the water used will have a considerable influence on the life of this equipment, and consequently also on the cost of the steam or power. It is therefore evident that the problem of the purification of the water assumes a very great importance.

In a purifying system, certain requirements must be met: it must be able to furnish large quantities of non-incrusting water, at a minimum cost and with an apparatus of such size that it will not be cumbersome. In the case of large central power stations (where as much as 1,000 tons of water per hour are evaporated) the older methods of purification, which have been successfully employed for many years, become inapplicable because of the excessive size of the equipment required to handle the huge quantities of water to be purified, the high cost of the equipment, and the large consumption of chemicals. One solution of the problem consists in supplying distilled water to the boiler. This, though very satisfactory in many respects, still has certain defects. Industrially distilled water contains a certain amount of entrained salts, which gradually concentrate in the boiler, and their concentration may become quite high. Moreover, it has been proved that distilled water more readily dissolves atmospheric gases (and more particularly oxygen) than those waters containing a certain amount of salts in solution: hence in such a plant the scaling of the boilers is replaced by corrosion due to the dissolved gases.

The continuous blow-off method of water purification, together with the elimination of the dissolved gases in the water, can completely eliminate both the scaling up of the boiler and the corrosion due to the dissolved gases, and it can be used in conjunction with the use of distilled water in the boilers. This is effected with a very compact apparatus and in a very economical manner, so that the process has a very brilliant future ahead of it. As a matter of fact it is being installed in the largest and most modern central power stations.

We shall study the principle of this process, which, though known for some time past, has not yet received the recognition which it deserves.

General discussion of water purification:

The object of water purification is to free boiler water of the alkaline earth salts which it contains and which on decomposing in the boiler deposit a scale. These salts can be divided into two classes, the carbonates and the non-carbonates. In the majority of natural waters salts of the first kind predominate and the most important of them are the bicarbonates of lime and magnesia. In the usual processes of purification these are eliminated by the addition of lime or of baryta, or by the addition of caustic soda, or by the addition of soda ash, the reactions coming into play being as follows:

$$Ca(HCO_3)_2 + CaO = 2CaCO_3 + H_2O$$
$$Ca(HCO_3)_2 + 2NaOH = CaCO_3 + Na_2CO_3 + 2H_2O$$
$$Ca(HCO_3)_2 + Na_2CO_3 = CaCO_3 + 2NaHCO_3$$

carbonate of lime or of magnesia being precipitated in every case. The bicarbonates of lime and magnesia can also be eliminated by permutation (Permutit process), in which case they are replaced by an equivalent amount of bicarbonate of soda. The water which is introduced in the boiler is always alkaline.

To the second class of salts, viz., the non-carbonates, belong a very large number of compounds, of which we shall mention only sulphate of lime (gypsum) and magnesium chloride. It is practically impossible to remove sodium chloride from any water. The reactions of carbonate of soda on gypsum and magnesium chloride are as follows:

$$Na_2CO_3 + CaSO_4 = Na_2SO_4 + CaCO_3$$
$$Na_2CO_3 + MgCl_2 = 2NaCl + MgCO_3$$

Here again the lime and magnesia are precipitated as carbonates, while the quantity of alkaline salts in the water is increased. These salts can also be removed by permutation.

Except in the case of the Permutit process, none of the above reactions are quantitative. They reach a state of equilibrium and in order to displace the equilibrium point in the direction required to precipitate as much of the lime as possible it is necessary to add an excess of the precipitating reagent, so that in every case the water added to the boiler is alkaline and contains some sodium carbonate. The concentration of water-soluble salts in the boiler rapidly rises, and also its alkalinity. Moreover, lime salts, which had not been completely precipitated before the water entered the boiler, give rise to sludge and to scale in the boiler. When the concentration reaches a certain stage the water foams and consequently the steam entrains a certain amount of water. At this stage it is necessary to empty the boiler, at least partially, and this causes a considerable loss of water, of heat, and of sodium carbonate.

Continuous blow-off method:

This is a soda purification process, which eliminates the above-mentioned losses, maintains the solids content of the water at a practically constant and relatively low value, considerably reduces the amount of soda ash required for the treatment of the water, and allows the water to be fed into the boiler at a high temperature, which is particularly favorable to the elimination of the dissolved gases.

This method of purification works in a closed cycle, and to explain it we must start at some point in the cycle. We shall choose the boiler.

The water in the boiler contains a greater or less amount of sodium carbonate, which, at the high temperature prevailing in the boiler, is partially decomposed into caustic soda and carbonic acid, the amount of decomposition being increased by high temperature, prolonged boiling, and low concentration, (owing to dissociation). Concurrently with this decomposition, the lime salts which have been carried into the boiler are concentrated and precipitated. But in the method under consideration this precipitation never results in

the formation of scale owing to the continual circulation and renewal of the water in the boiler.

The blow-off valve of the boiler is permanently left open, so that a certain proportion of the water escapes. The blow-off, which consists of a mixture of water and steam at a very high temperature, enters tangentially into a steam separator, **S**, Fig. 1, at the base of a raw water heater, **R**. The steam, on bubbling up through the water, condenses, and at the same time

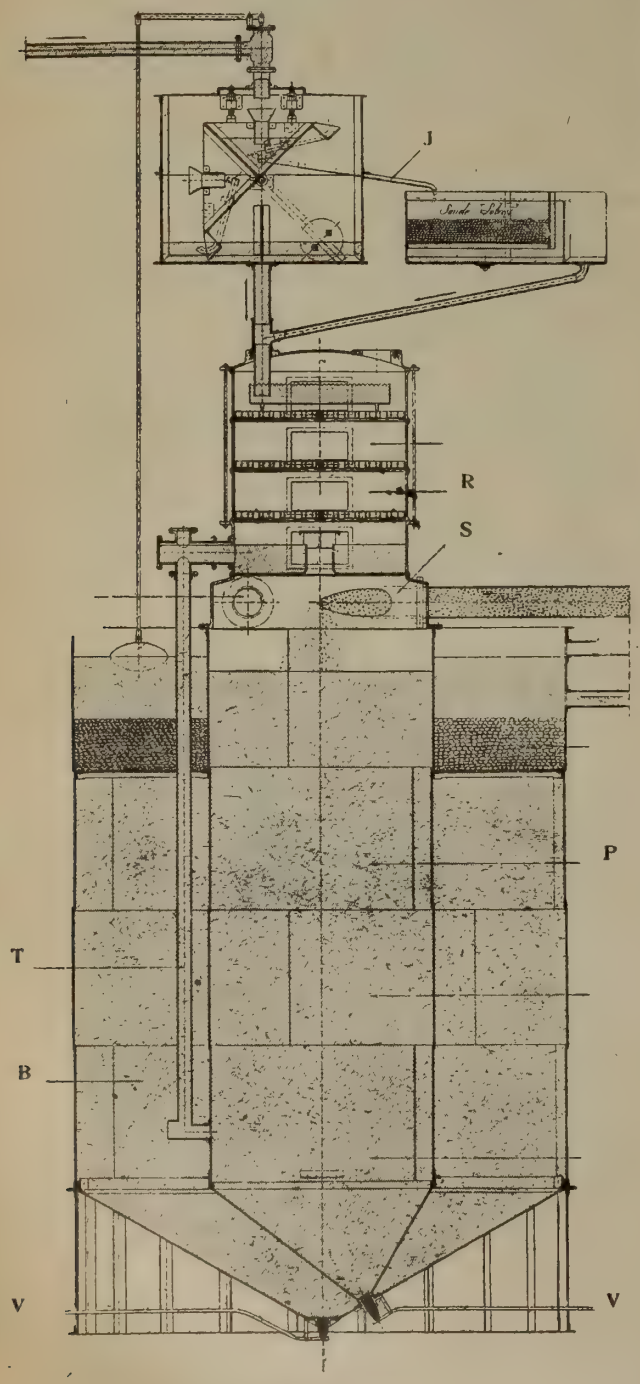


Fig. 1.

precipitates the bicarbonates of lime and magnesia by raising the temperature of the water. Before the water is delivered into the heater **R**, it is measured and the amount of soda ash equivalent to the noncarbonate incrusting solids is added at **J**. The blow-off water from the separator **S** falls into the central tank **P**, in which it slowly travels downwards, thereby favoring the settling out of the sludge which it contains. Further, the cooling of this water by the raw water precipitates lime salts which were soluble at high temperatures. This precipitate, together with the sludge, settles at the bottom of the tank **P** and is periodically drawn off through **V**. The raw water comes down through the pipe **T** at a temperature in the neighborhood of 100°C and mixes with the blow-off water; and the mixture is drawn off through $\mathbf{V}^1$ at the bottom of the outer tank **B**.

The caustic and carbonated alkali of the blow-off water react with the raw water, precipitating the alkaline earth bicarbonates; as shown in the above equations. It is to be noted that the alkali contained in the blow-off water completely remains in the water, the caustic alkali being quantitatively transformed into carbonate while the carbonate is quantitatively transformed into bicarbonate. The first reaction takes place more readily than the latter, which requires a greater excess of reagent, and they can both occur simultaneously.

The precipitation, which requires two and a half hours in the cold, is complete in 15 to 30 minutes at the temperature of boiling water, so that the size of the apparatus can be reduced very considerably.

The water from the purifier is at a temperature of nearly 100°C and contains no alkaline-earth salts. It contains the exact equivalent as bicarbonate and carbonate, of the alkali which was present in the blow-off water as carbonated and caustic alkali, since the amount of soda ash added to the raw water was just sufficient to decompose the non-carbonate alkaline-earth salts. Consequently, the alkalinity of the salts in the water in the boiler is maintained constant.

In the boiler, the bicarbonate of soda is transformed into carbonate by loss of carbonic acid, and the carbonate is partly decomposed into caustic alkali, thereby completing the cycle.

Theoretically it should be sufficient to add just enough soda ash to precipitate the alkaline earth salts other than the carbonates; but in practice a little more than this is required to make up the slight losses which occur when the sludge is withdrawn from tank **P**.

When first starting up a boiler, it is necessary to add a considerable excess of soda ash over that required for the precipitation of the incrusting solids in the water contained in the system boiler-purifier-separator. The amount cannot be determined beforehand, as the excess required depends on the amount of caustic soda formed (which in turn depends largely on the temperature of the water in the boiler) and on the temperature at which the precipitation is carried out. The only guidance is that the greater the amount of caustic the less the excess of soda ash required, and the lower the temperature of precipitation the greater the excess of soda ash to be added and the greater the time required for the settling of the precipitate. If there is a deficiency of soda, it may be added to the raw water until the proper amount has been introduced into the system; while if there is too great an excess, its addition to the raw water is stopped for a short time until the amount has been sufficiently reduced.

In the case of boilers operating on distilled water this system can be applied: it may be used for the purification of the water fed to the distilling boiler (in which case the problem is the same as the one just described), and it may also be used for the boilers operating on condensation water. Water distilled in

a boiler still contains numerous salts, though in very much smaller quantities than the raw water. Nevertheless, these would gradually accumulate in the boilers and would have to be removed by blowing off the boiler periodically. Further the entrainment of organic solids is relatively ten times as great as that of mineral salts, and small amounts of the former have a much greater power for inducing foaming of the water. These are brought down by the precipitation of the calcium carbonate in the purifier.

Chemical Balance of the Process:

We have just seen that the consumption of soda ash is diminished over that required by the usual processes by the amount required to precipitate the alkaline-earth carbonates present in the water; so that this process is particularly economical for the treatment of waters containing large amounts of calcium and magnesium bicarbonates, as is generally the case. This can best be brought out by means of a concrete example, and we shall take the case of a central station taking its water from the Seine, which has the following composition in grains per litre:

Sodium chloride	0.0065
Magnesium carbonate	0.0130
Calcium carbonate	0.1816
Calcium sulphate	0.0208
Iron and aluminium oxides	0.0015
Silica	0.0030

The purpose of the purification is to eliminate the carbonates of calcium and magnesium and the sulphate of calcium.

If the continuous blow-off process is used, when the boiler is first started up enough soda ash must be added to precipitate all the incrusting solids of the water contained in the boiler, in the tank containing the purified water, and in the purifying apparatus. This would theoretically require 226.6 g. of soda ash per metric ton of water, if only raw water was fed to the boiler. Once this required amount of soda ash has been added to the system, there need only be added sufficient soda to precipitate the calcium sulphate (16.70 g.) of soda ash per ton of raw water) and a slight excess required to make up the losses through the withdrawal of the sludges. This excess must be determined by practice; but it is always very much less than the amount required for the precipitation of the calcium sulphate. The theoretically minimum of sodium carbonate in the boiler is therefore 219.9 g. per ton of water. But in practice these theoretical minima of 226.6 g. and 219.9 g. of soda ash are never attained. The raw water loses a considerable amount of its bicarbonates in the heater **R**, up to 75% if its temperature is raised to near the boiling point, and even more if it remains sufficiently long in the heater. Moreover, the raw water constitutes at the most 1/40 of the feed water, so that the alkalinity of the water in boiler can be reduced to $\frac{1}{40} \times \frac{1}{4} = \frac{1}{160}$ of the value given off, i.e., the soda content can be considered as being practically 2 g. per cubic meter of water.

The precipitation of bicarbonates of lime and of magnesia by means of soda ash is very slow at low temperatures, but much more rapid at higher temperatures. But at 80°C it still requires 4 times the theoretical amount of soda ash to obtain a complete precipitation from the Seine water in 20 minutes. This is due to the fact that the formation of bicarbonate of soda from the bicarbonate of calcium is a very slow process, and as it is due to a double decomposition a very considerable excess of reagent is required to displace the equilibrium point so as to increase the precipitation. But in the continuous blow-off method the precipitating reagent is sodium carbonate containing a considerable proportion of caustic soda, resulting in a complete precipitation when there is an excess of 40 to 60% of the caustic soda over the theoretical amount of soda ash required. Moreover, this excess does not entail any consumption of chemicals, as it always remains within the cycle of operations. Finally the precipitate from caustic soda is much coarser and settles very much more rapidly than the precipitate from sodium carbonate. Numerous experiments have shown that the corrosive action of soda ash on boilers is greater than that of caustic soda. The latter is a maximum for a concentration of 0.1% of NaOH, and then falls off very rapidly with increase in the concentration, becoming practically zero at a concentration of 1%. Moreover, the elimination of the dissolved gases eliminates corrosion.

The following are a few typical analyses of waters taken from boilers operating under this method:

	1	2	3	4	5
Raw Water.					
Total hardness	33.3	25.7	16.6	33.3	75.24
NaOH required for the precipitation of the carbonates	377	278	168	371	479
Na_2CO_3 required for the precipitation of the non-carbonate incrusting solids	51	83	33	52	34
Blow-off Water.					
Hardness	1.1	1.8	1.6	1.8	0.97
Na_2CO_3 content	567	411	1451	227	536
NaOH content	500	310	1752	118	100
Total alkalinity (as Na_2CO_3)	1230	822	3775	384	669
Percent of Na_2CO_3 converted into NaOH	33.9	50	61.5	40.9	19.9
Purified Water.					
Proportion of raw water	60.7	65.6	83.9	55.7	67.1
Proportion of blow-off water	39.3	34.4	16.1	44.3	32.9
Hardness of purified water	1.7	4.3	1.8	3.9	1.23
Na_2CO_3 content	502	273	306	115	273
NaOH content	0	0	126	0	0
Temperature (degrees)	84	50	70	82	

Thermal Balance.

From a thermal point of view, the object to be attained is the heating of the feed water to a temperature of 80 deg. C., or more, by mixing with blow-off water. The calories contained in the blow-off water are completely absorbed by the feed water, except for loss through radiation from the piping and equipment. But this loss can be reduced to a minimum by covering with some suitable heat-insulating material.

Disregarding the loss of heat through radiation, the proportions of raw water and of blow-off water at various temperatures required to bring the feed water up to 80 deg. C. may be calculated and will be found to be as follows:

Raw Water		Blow-Off Water	
Temperature (degrees C.)	Percent of Mixture	Temp. of boiler (degrees C.)	Percent of Mixture
0	46.7	150	53.3
0	56.6	180	44.4
0	60.0	200	40.0
0	64.9	225	35.1
10	50.0	150	50.0
10	58.9	180	41.1
10	63.2	200	36.8
10	67.4	225	32.6
20	53.9	150	46.1
20	62.5	180	37.5
20	66.6	200	33.4
20	70.8	225	29.2

It is thus seen that when the temperature of the raw water is between 0 deg. and 20 deg. C., and that of the boiler between 150 deg. and 225 deg. C., the blow-off must constitute from 30 to 50 per cent of the purified mixture. In the case of the maximum amount of blow-off water, viz., 50 p.c., the amount of blow-off is equal to the amount of raw water used. Now, in a central station the amount of make-up water is about 2 to 5 per cent; and hence in the present instance, the amount of the blow-off will also be about 2 to 5 per cent of the water in the system. This means that the water in the boiler will be completely replaced in from 20 to 50 hours, and it is thus seen that under these circumstances, even when the steam consumption is very high, there can be no scaling in the boiler.

Of course conditions may be such as to make it advisable to work under slightly different conditions, either to modify the conditions of purification or the concentration of the salts in the boiler. Purification at 100 deg. C., for instance, would allow of reducing the size of the purifying apparatus; while in other cases, owing to the use of economizers, it is not practical for the precipitation to be carried out at a higher temperature than 70 deg. C., in which case the settling of the precipitates is somewhat slower.

Advantages of the Continuous Blow-Off Method.

The advantages of this method can be grouped under three headings: chemical, thermal, equipment.

1) The chief advantage from a chemical point of view resides in the very greatly reduced consumption of the purifying chemical reagent. In the case of the Seine water above referred to, the consumption of chemicals when purifying by the more usual processes are as follows (theoretical minimum required for the treatment of one metric ton of water):

Soda ash method — 226.60 g. soda ash.
Lime and soda ash method — 110.89 g. of lime; 16.70 g. of soda ash.
Baryta process — 366.43 g. baryta.
Permutit process (required for the regeneration of the reagent) — 160.70 g. of sodium chloride.
Continuous blow-off method — 16.70 g. of soda ash.

These figures speak for themselves and are more eloquent than words.

2) From a thermal point of view, the continuous blow-off process possesses the advantage of feeding into the boiler a water at a high temperature. This point is too well known to require further explanation. We shall merely mention that, even when the water leaves the purifier at 100 deg. C., it is still possible to use economizers and obtain a very appreciable saving with them; and should the use of economizers require it, it is always possible to carry out the purification at 70 deg. C. If a device is placed between the purifier and the economizer to eliminate the dissolved gases out of the water, iron equipment may be safely used without danger of corrosion, in spite of the high temperatures.

3) As far as the equipment is concerned, the size of the purifying apparatus is much smaller than that of the usual cold precipitation processes, because the precipitation and settling are much more rapid and complete. The water can be measured by means of a simple weighing machine, which does not occupy much space and can be placed in some corner of the boiler room. The apparatus is thus in a position where it can be operated all the year round; while those which are so large that they must be placed in the yard cannot be operated in winter as they would freeze up.

The amount of the blow-off can be automatically regulated by a thermostat so as to give a constant temperature to the water in the purifier. By means of the arrangement shown in figure 2, there is no danger of the water getting too low in the boiler. The intake

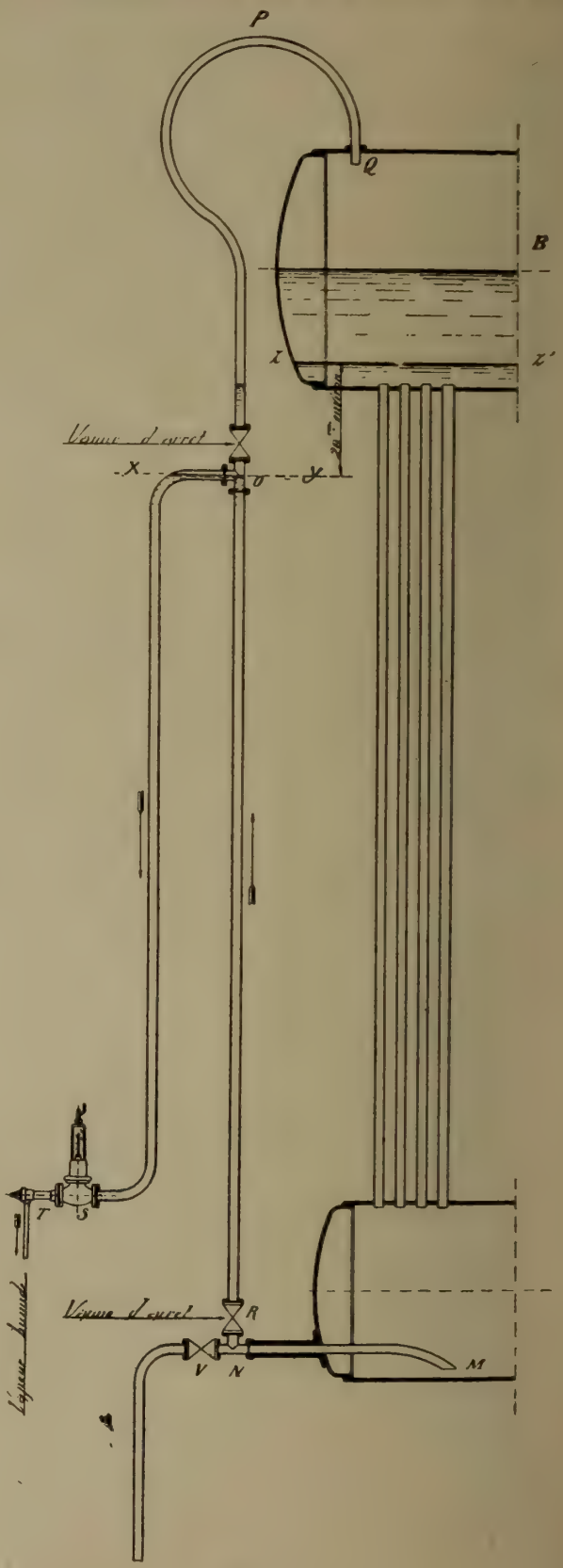


Fig. 2.

of the blow-off is at M and when the apparatus is working normally the mixture of water and steam follows the path MNOS, the valve V being closed. S is a reducing valve to relieve the pressure, and

from there the mixture of water and steam goes to the separator and water purifier. At O there is a connection leading to the steam space of the boiler. The normal water-line in the boiler is about A B. Should the amount of water withdrawn be to great, when the water-line drops to a predetermined level, say ZZ', the level at O drops to XY, so that only steam escapes, and it is made to operate an alarm to warn the fireman.

It is thus seen that the use of the continuous blow-off is quite safe. It can be adapted to all existing boilers; and during the last few years it has earned for itself a very enviable reputation in the large central power stations of Germany.

British Trade News

(From OUR LONDON CORRESPONDENT.)

London, March 22, 1921.

The seventh of a series of informative luncheon addresses, arranged by the Livery Committee of the Stationers Company, was given the other day at Stationers Hall, London, when Mr. R. W. Sindall F.C.S. (of Sindall & Bacon, the paper chemists) gave an interesting address entitled "What is Paper?" Mr. Sindall made reference to the demands sometimes made upon the papermaker by the printer who, if he only had some knowledge of the principles of papermaking, might not put forward so many requests which seem to the expert papermakers to be more or less unreasonable. Mr. R. A. Austen-Leigh, President of the London Master Printers' Association, was in the chair.

Depression Still Rife.

Depression still continues in the British paper industry. One well-known papermaker said to me this week that "There was no life in things at all and some of the mills are being badly hit." This about sums up the whole situation. Papermakers are now looking for work for their machinery, they cannot get enough to keep it running; but prices do not show any material drop. For pure printing paper a minimum has been agreed upon by the makers, which will stand good until the end of April, so that it will be seen the mill men are holding out as long as they can for their prices. Indeed it is said that some mills are selling pure papers at a loss in order to reduce the stocks.

Forestry.

The Forestry Commission are getting a move on in the right direction and if their recommendations are carried out it is estimated 2,000,000 acres of land in the United Kingdom will be turned into state forests. Experts say that in 30 or 40 years' time the United Kingdom would be independent of foreign sources for timber supplies of ordinary sorts. This, of course, would not include pulp wood, though an expert pointed out sometime ago that if the waste ground of England, Wales and Scotland was planted with enough spruce in 20 years time there would be sufficient supplies of raw material to meet our normal output of paper, or even more. Forestry, however, is receiving more attention in the United Kingdom as the war was responsible for the depletion of extensive forests in order to provide material for huts and duck-boards and a thousand other incidentals in Belguim and France.

Imports from Canada.

At this period of the year there is always a falling-off in the imports from Canada and Newfoundland. This is noticeable in the supplies of strawboard, millboards, and cardboard. Of millboards Canada sent in February 424¾ tons and U.S.A. 151 tons. Canada holds a conspicuous place in supplying millboards to the British market, which is a notable place for consuming all kinds of boards—straw, card, paste, leather, and millboards. The total imports, in tons, in February were, roughly: strawboard, 8,174; millboards, 1,492; card and pasteboard, 422; leatherboards, 109. Most of the strawboard supplies come from the Netherlands.

Pulp Situation.

The pulp market continues dull and only a few spot lots of chemical pulp have changed hands during the past week. Groundwood is also neglected and the market shows no signs of a revival. As mentioned in the "Pulp and Paper Magazine" some weeks ago, there is still a strike on in Sweden and many mills are remaining closed. Quotations run: Sulphite (Bleached) No. 1., £46—£49; Easy Bleaching, £35—£38; Sulphite News, £30—£34; Unbleached Soda, £30—£35; Soda Kraft, £28—£29; Groundwood (Wet), £10; Groundwood (Dry), £19 10s.—£20.

According to advices received in London the Swedish Pulp Association has decided that all questions regarding the fulfillment of contracts should be left to the buyers and sellers to settle individually between themselves. "Affarsvarlden" says "Pulp makers cannot take into consideration proposals to simply cancel running contracts, which certain papermakers in England and on the Continent try to carry through. A pulp contract cannot be cancelled by one party only because it has proved to be unfavorable for that party." All this discussion arises out of the revision of contracts brought about by the depression in the paper industry. The great majority of the pulp men have met the papermakers in a very fair manner but, of course, there are bound to be grievances on the buyers side.

British Columbian Prospects.

A writer in the "Times," commenting on the pulp and paper trade of British Columbia, says that "far from indicating a further period of inactivity, lower prices at the present time are the only hope of a trade revival. Costs of production must come down, and are doing so. When normal is again registered on the trade thermometer, the pulp and paper trade in British Columbia will get into its stride. Stocks in the United States paper mills were seldom lower than now."

Hand-made Paper Mill Re-opened.

The hand-made paper trade of England is enjoying very fair prosperity just now and after seven years being shut down the Shoreham Mill, in Kent, is being re-opened under the guidance of Mr. Wm. A. J. Foster, who has had great experience in the hand-made product, and who has secured the shares and debentures of the Shoreham Mill. There are 3 vats in the mill and papers are produced for books and writing.

Problem's of the Papermaker.

Mr. Wm. A. Aitken, the works manager of the Westmill of the Imperial Paper Mills Ltd., Gravesend, and practical adviser to the Empire Paper Mills Ltd., Greenhithe, has published an interesting booklet called "Some Problems of the Papermaker—Their Practical Solution," which relates to a series of patents Mr. Aitken has taken out. He has visited Canada and the U.S.A. for the purpose of studying conditions there and as a practical papermaker has had wide experience.

His booklet is very interesting and worthy of the attention of Canadian papermakers.

The President of the W.P.A.

Mr. L. P. Andrews, President of the Wood Pulp Association, has done a good deal of travelling within the last six months. He has visited Canada and now he is in Scandinavia studying conditions. Mr. Andrews is a gentleman who will insist on first-hand information about pulp and he likes to investigate things from his own particular point of view.

Long Service.

Mr. Robert Gilroy, has been presented with a smoking cabinet by the workers of the three mills owned by Messrs. A. M. Peebles & Son, Ltd., as a memento of his 25 years service. Mr. Gilroy is one of the best known men in the British paper industry. He is a great organizer and most determined in anything he undertakes.

Notelets.

Hon. Rupert Beckett says last year his firm paid on an average 11 cents a lb. for newsprint as compared with 2½ cents a lb. in the pre war days. Had paper been less costly expansion would have been still larger than it had actually been.

Mr. Wm. Barlow, a director of the Burnley Paper Works, and a nephew of Lord Doverdale, a former President of the Papermakers' Association, has died at the age of 64 years.

The Siamese Government intend purchasing a small experimental paper mill and an American is to set things going for them.

Strawboards are selling in London at £8 8s. a ton.

Japanese Paper Manufacturers Union has decided to subsidise the export trade. They will allow five sen on every pound of paper sent abroad from their mills.

U.S. IMPORTS OF PAPER AND PULP.

During the month of December the United States imported 58,275 tons of newsprint from Canada and 23,514 tons from abroad. Germany contributed 14,206, Sweden 5,267 and Finland 2,297 tons. The overseas imports for the one month were nearly as large as for the preceding eleven months of the year, which totalled only 27,622 tons. The total imports of newsprint for the calendar year 1920 were 678,732 tons from Canada and 51,136 tons from overseas countries. The Canadian imports represented about 32 p.c. of the total U.S. consumption.

For the first time in the history of the United States the total exports of newsprint paper during 1920 were exceeded by the imports from abroad, the former totalling only about 45,000 tons for the year as compared with overseas imports of 51,136 tons.

U.S. imports of groundwood during 1920 aggregated 176,740 tons from Canada and 30,731 tons from other countries. The Canadian imports represented nearly 10 per cent. of the total domestic consumption. The imports of news-grade sulphite from Canada in 1920 amounted to 187,493 tons or 18 per cent. of the total consumption. Imports of unbleached sulphite from abroad amounted to over 100,000 tons, but this was not used in the manufacture of newsprint.—Spanish River News.

Blessed is he who has to pay an income tax, for, verily, he hath an income.

EXPECTS REVIVAL IN ENGLAND.

That business conditions in Great Britain are similar to those existing in Canada is the opinion of H. W. Sherriff of the Hodge-Sherriff Paper Co., who has just returned to Toronto after three months spent in the British Isles on business connected with the Wayagamack products. He adds however, that there is a difference between the situation as it exists in the Motherland and Canada in the fact that dealers over there are saddled with large stocks of paper and other commodities as well, which cannot be considered the case in this country. In conversation with the Pulp and Paper Magazine, Mr. Sherriff said the paper trade generally over there was slack and as a consequence the jobbers could not get rid of their stocks. It came under Mr. Sherriff's observation that the name of Canada was held in very high esteem in the old land and there was a disposition to speak with deep appreciation of the considerate treatment meted out by the Canadian pulp and paper mills to the Old Country trade as compared with the dealings of the foreign mills. The English paper dealers, said Mr. Sherriff, realized that during the eighteen months of abnormal trade the home trade had to be looked after but the Canadian dealers are generally given the credit for having done the best they could by their confreres, in the trade across the water, under somewhat difficult circumstances, with the result that as soon as paper requirements become pronounced again Canadian manufacturers will be given the preference. At the present time the relations between those in the paper trade in the Motherland and Canada are on a sound and friendly footing and it is Mr. Sherriff's opinion that these relations can be still further cemented by the Canadian dealers adapting themselves, as far as business interests will allow, to Old Country methods and making allowances for the difference in the two systems. Despite the hard knocks the mother country was getting through labor troubles, and strikes, and the generally unsettled condition of affairs in Europe, it is Mr. Sherriff's opinion that business will pick up within the next few months, but it will be largely contingent upon the settlement of the German reparation question. In this coming business revival Canadian manufacturers are destined to get a good share if they are careful to adjust themselves to business methods and conditions in England.

During his visit to England Mr. Sherriff was invited by the Canadian authorities in London to attend a conference in reference to the proposal to establish a Canadian Chamber of Commerce in London, which was held at the office of the Agent General of British Columbia and which was attended by many of the leading Canadian business men in the capital. At the meeting the opinion was expressed that the time was now ripe for an organization of the kind which would be of great service to the business interests of the Empire and to the business representatives of firms in Canada, the United States and other countries.

Since his return Mr. Sherriff has visited a large section of the paper trade in Toronto and Montreal and he states that he found business conditions not nearly as bad as he had been lead to believe, while in England.

Poland, in its fir trees, has an abundance of raw material for production of cellulose, and several factories are needed to supply local paper factories with enough cellulose for home demands.

Transactions of the Technical Section

THE MICROSCOPE AND ITS RELATION TO THE PULP AND PAPER MILL.

(Continued from last issue.)

Spectral Transmission of Filters.

The spectral transmission of the above mentioned filters in connection with photographing pulp having already been stained with Hersberg stain, is

Name of Filter	Visual Color	Spectral Transmission
B	Green	From 5,800 to red end
C	Blue violet	4,000 to 5,100
D	Purple	3,800 to 4,600 or from 6,400 to red end.
H	Blue	4,200 to 5,400
G	Strong Yellow	5,100 to red end
F	Red	6,100 to red end

These filters can be obtained from the Eastern Kodak Company Rochester, New York, and all the available information regarding the use of them is described in three or four booklets which they publish and which, if it is intended to go into photomicrography extensively, should be consulted.

Another important consideration is the relation of the color of light to the resolving power; as aforesaid, the distance between two lines which can just be resolved by a microscope objective is equal to half the wave length of the light by which it is observed, divided by the numerical aperture of the objective.

Formula Distance $= \frac{\frac{1}{2} W L}{N A}$ For instance, with a numerical aperture of 1.0 and an F filter (F filter pure red spectro transmission 6,100 to red end) and we will be able to go to 80,000 lines to an inch.

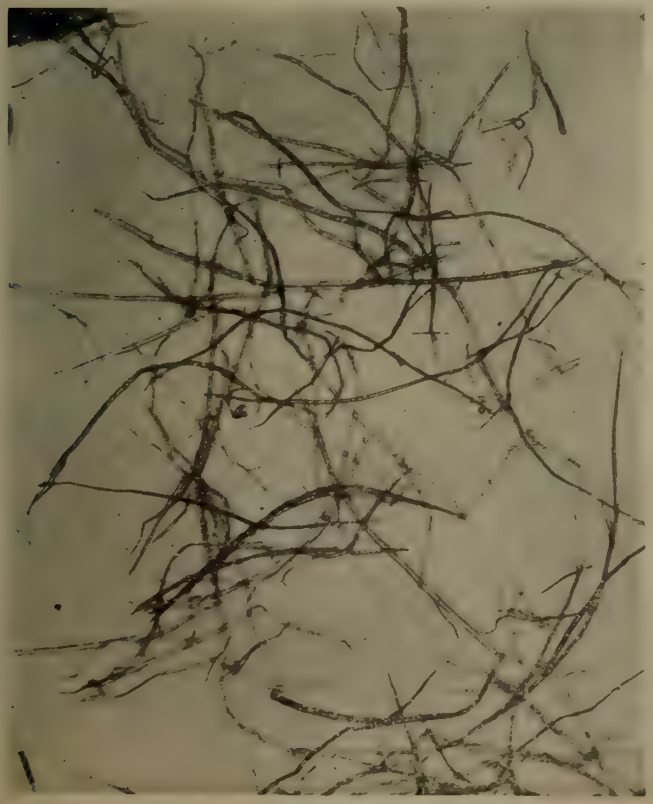


Fig. 1. Properly cooked, unbleached sulphite. Note long, straight fibres. — Magnified 20 times.

Time of Exposure.

Another important factor is exposure and the Eastman Kodak pamphlet on micrography gives a table showing the effect of the numerical aperture in regard to the variation of exposure and also the exposure factor. It is hereby repeated:

Effect of Numerical Aperture.

Exposure varies as $\frac{1}{(N.A.)^2}$

Focal Length.	Average N.A.	Approximate Exposure Factor.
4 in., 100 mm.	.08	40
3 in., 75 "	.09	30
2 in., 50 "	.15	10
1 in., 25 "	.25	4
2-3 in., 16 "	.35	2
½ in., 12 "	.45	1¼
1-3 in., 8 "	.50	1
1-4 in., 6 "	.8	2-5
1-6 in., 4 "	.85	1-3
⅛ in., 3 "	.9	1-3
1-12 in., 2 "	1.3*	

*(Only 1.0 for photography).

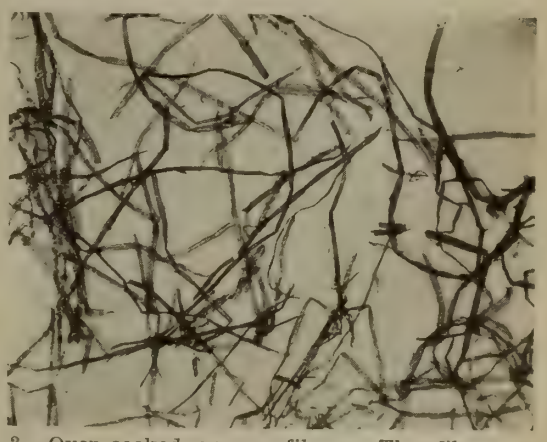


Fig. 2. Over-cooked spruce fibres. The fibres are very brittle and easily broken. — Magnified 20 times.

Light for Microphotography.

Light is one of the most important factors in this work, particularly as to its steadiness and for this reason the concentrated filament gas filled bulb has displaced the arc light in many instances, as the bulb gives a steady wave of light, while the least draft or displacement of some part of the arc producing apparatus causes considerable fluctuations and above all a steady source of light is absolutely necessary.

It is really a pleasure to contribute anything which, in more capable hands, might prove of value to the industry, but I am sure you will understand me when I say that a subject such as this, involving practically every phase of our industry, cannot be satisfactorily presented, or the matter completely covered, in a fashion such as I have given.

Further, as my work has been of a nature of sales rather than of manufacturing, my progress has been somewhat hindered and I must leave it more or less entirely up to you gentlemen to take the suggestions



Fig. 3. Properly bleached sulphite pulp. The fibres are long, but not so stiff or straight as in unbleached pulp. — Magnified 20 times.

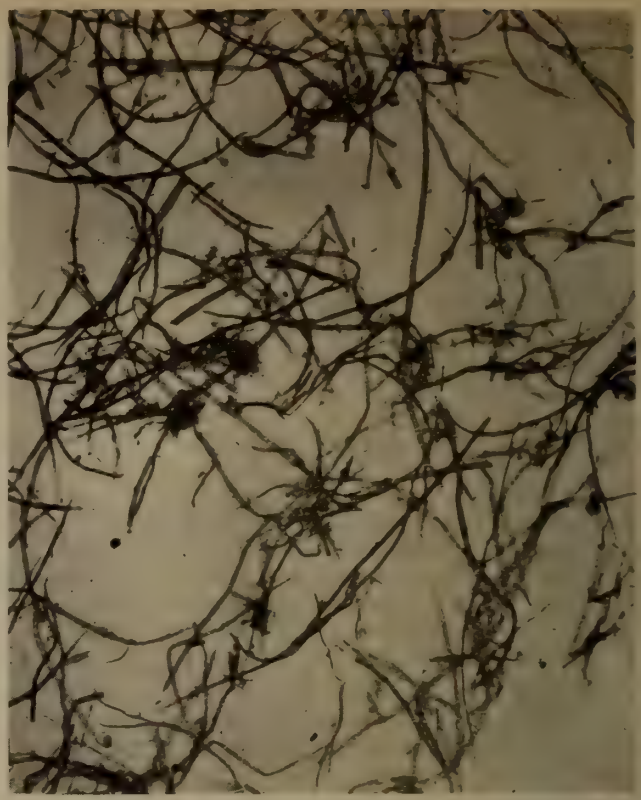


Fig. 5. Properly beaten sulphite pulp. The fibres are still fairly long, but some have been ground up into fine material which helps to cement the longer fibres together in paper. — Magnified 20 times.

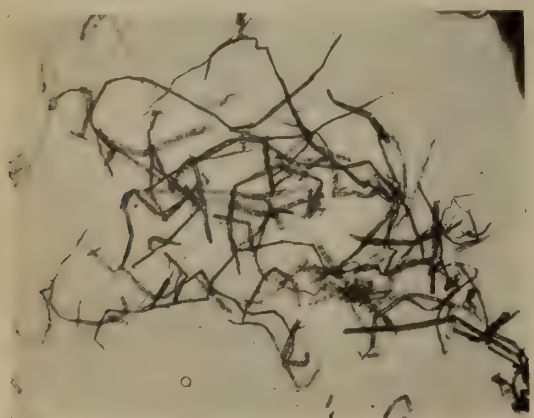


Fig. 4. Overbleached spruce fibres. The fibres are extremely brittle and easily broken. Specks showing on the fibres are due to deposits of calcium salts from the bleaching agent. — Magnified 20 times.

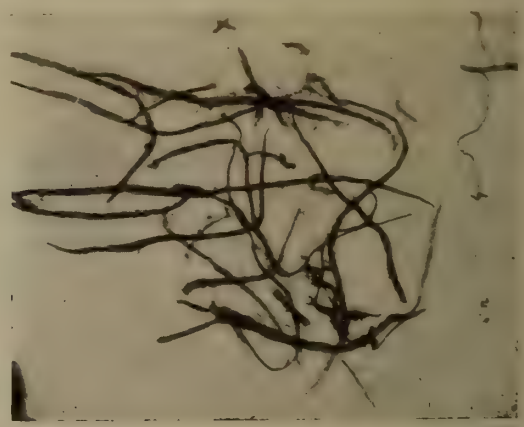
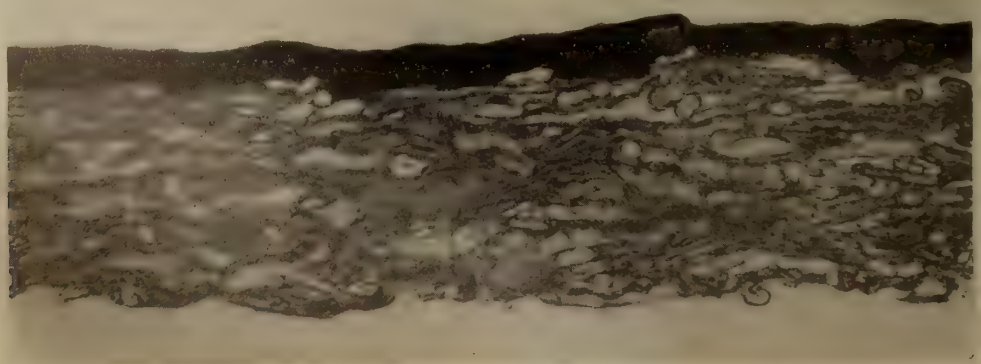


Fig. 6. Over-beaten spruce fibres. Note that fibres are greatly mashed and frayed with a large amount of very fine material. — Magnified 20 times.



Cross section of Azo, Hard X photo paper showing gelatine layer carrying silver emulsion and general lay of fibres. Cut across machine direction. — Magnified 225 times.

I have made as at least a thought for furthering activities along these lines.

DISCUSSION.

Some Specific Uses of the Microscope in the Pulp and Paper Industry.

Following Mr. Gartland's address, Mr. H. N. Lee, of the Hammermill Paper Co., Erie, Pa., squeezed some very helpful comments into the short time intervening before the showing of the Riordon film on Sulphite Manufacture. He stated that a person need not be daunted by anticipated difficulties in using a microscope, nor should one expect this instrument to solve all his troubles.

Mr. Lee has summarized his remarks as follows:

1. Identification of fibres in paper, identifcation of wood, tests to distinguish bleached and unbleached pulps, sulphite and sulphate pulps, identification of certain sizing and loading materials, examination of water, and other tests are so well known in the pulp and paper industry that they do not need to be discussed here. But there are other ways of putting the microscope to good use that are not so commonly employed.

2. In many cases the best value is not received from microscopical examinations if they are conducted apart from other tests. The man making microscopical investigations should be well acquainted with the processes in the mill, or if this is not possible, he should be in close contact with someone who does know the manufacturing methods. Microscopical observations may also be advantageously linked with chemical research with the result that both will profit.

3. The microscope, and particularly photomicrographs, may be made of great value in showing the men in actual production the effects which improper handling of the stock has on the fibre. The accompanying photomicrographs illustrate some possibilities in this direction. To see some of the actual effects on the fibre means more to the operator than to have only word description.

4. We have recently made some comparative studies of pulp made in different mills or under varied conditions in the same mill, and these have brought many things to light. For example, breakage of fibre, straightness of fibre, the presence of certain types of dirt, indications of over-bleaching, and other features can be distinguished and used to considerable advantage in locating and correcting causes of trouble. Possibly the identification of the nature of dirt offers the field in which the most profit may be quickly secured. Similar studies may be made on paper and in the case of dirt it may be found that the specks are not present in the pulp, but have been added in the later processes. Leather and other packing materials are sometimes found and lead to detecting sources of dirt and repairs or changes to eliminate it.

5. It appears that pitch is blamed for much trouble in the paper mill. The use of the dye Soudan III. will show whether or not pitch is present, and sometimes it will be found that pitch is not the cause of the trouble.

6. A line of investigation which has not yet been much attempted is that of the study of sections of papers. (See illustrations). It looks as though such problems as the kind, condition, and distribution of the fibres, the lay of the fibre, the penetration and distribution of sizing material and many other points may be very advantageously looked into by means of this method.

7. The apparatus necessary to carry out such studies is neither very extensive or expensive. The results obtainable depend on the time and energy devoted to the work, but considerable can be accomplished with a comparatively small equipment and a very reasonable amount of time.

BROMPTON TO ISSUE ATTRACTIVE BONDS.

Shareholders of the Brompton Pulp and Paper Company Limited, yesterday afternoon approved of the proposal of the directors of the enterprise in respect to the creation of a new issue of $3,000,000 twenty year 8 per cent. convertible bonds, and passed a by-law authorizing such action on the part of the board.

As previously announced, the new securities will carry the right of conversion into the common stock of the Brompton Company, on the basis of two shares of no par value common for each $100 par value of bonds. The option in this respect will be good for a a period of ten years.

Of the total $3,000,000 bonds created under the new by-law, the directors have authorized the issue of $2,500,000, but it was stated that it was the intention of the board to confine the amount sold to the lowest minimum in view of the high cost of new financing at present, and that it was unlikely that more than $2,000,000 worth of the securities would be sold in the near future.

Mr. McCrea stated that for the first five months of the Brompton fiscal year, which began on November 1, last, earnings after deducting depreciation and bond interest, amounted to $560,000. Dividends on the common stock would depend on the maintenance of the profits from operations necessary to make such disbursements, as it was not the intention of the board to pay dearly for borrowed money and then distribute it among the shareholders.

January, it was stated after the meeting, was the poorest month of the current fiscal year in respect to earnings, but the decrease was a seasonal one. Results obtained in February, however, were much better than those of January, with a further improvement effected in March.

ABITIBI SHAREHOLDERS SATISFIED.

The satisfaction of shareholders of the Abitibi Power and Paper Company with the statement recently tendered them was manifest yesterday noon when only one or two outside the members of the board of directors appeared at the annual meeting of shareholders, held at the company's offices in the Sun Life Building.

President F. H. Anson commented upon the situation, saying that it was only following a poor statement that shareholders turned out in large numbers at annual meetings.

The board of directors remains the same as last year, the following gentlemen being re-elected to their seats: F. H. Anson, president; W. A. Black, G. E. Challes, W. K. George, G. H. Kilmer, K.C.; Victor E. Mitchell, K.C., D.C.L.; Shirley Ogilvie, Alexander Smith and Sir Thomas Tait.

KAPUSKASING WORK STOPS.

Cobalt, March 24.—Workmen returning here from Kapuskasing state that all construction work on the dam being built there for the Spruce Falls Company has been suspended, and the machinery taken out. Over 400 men are thrown out of work, it is declared, through the cessation of operations.

HEAVY CHEMICAL MARKET.

Chemical and Metallurgical Engineering of New York, under date of March 28th, says:—

"There are persistent reports from several directions of curtailed chemical production, while in some cases production has been temporarily suspended, as there is enough stock in second hands to take care of the demand at lower prices than producers can name. This condition is true among leading manufacturers of caustic soda.

In trying to analyze the chemical market, it is well to look into other markets, as conditions are practically similar and a great deal rests upon the materialization of developments there. The primary and wholesale markets, which for a time have shown a spotty improvement, have in many cases become dormant again. Railway traffic and earnings are decreasing continually. Steel output has fallen to less than one-half of mill capacity. Production of coal has fallen to the lowest point in the past few years and building operations are lagging far behind the total of new construction known to be in immediate demand.

Buyers as a result of existing conditions remain unwilling to contract for other than immediate necessities, which are at an extremely low figure.

The disposition on the part of some interests to sell English soda ash at $1.90 per 100 lb. ex-dock N. Y. is being watched very cautiously. Caustic soda held well owing to the suspension of production and consuming orders came into the market in better volume than in the past month.

Standard brands of caustic soda appear to be well held at the present time. Buyers demanding special makes are finding a stiff market. The general range was from $3.70 to $3.80 per 100 lb. ex-warehouse and $3.80 to $3.85 F. a. s. Occasionally arrivals from interior points go at a slight concession, while outside makes can be purchased in the neighborhood of 3½ cents per pound. Resale light soda ash is generally quoted at $1.95 to $2.05 per lb. in single bags. Offerings of English material have left the market in a somewhat unsettled condition. The feeling is prevalent in the trade that producers will be found to meet foreign competition, but as yet they have failed to do so. Barrels are quoted from $2.10 to $2.25 per 100 lb., according to quantity. Contract prices remain unchanged at $1.72½ per 100 lb., basis 48 per cent, in carlots F.o.b. works."

From Chicago the following is reported, under date of March 25th:—

"Consumers are still averse to anticipate and are buying only for their immediate requirements.

Soda ash, 58 per cent, continues to be firm and is quoted in barrels at $3.10 per 100 lbs. for small quantities. Caustic soda, 76 per cent, is quoted as high as $4.25 per 100 lb. in ton lots. Salsoda is moving in a small way at 2½ cents per pound. Bleaching powder is very dull, and is quoted at 3½ cents in 700 lb. drums."

The following general market prices prevail as of March 30th at New York:—

		Carlots		Less carlots	
Acid, acetic, 56 p.c.	100 lb.	$4.00	$4.25	$4.50	$5.50
Acid, glacial, 99½ per cent carboys	100 lb.	9.00	9.50	10.00	10.50
Acid, hydrochloric	100 lb.	1.75	2.00	2.10	2.25
Acid, sulphuric, 60 deg. drums	ton	....	....	15.00	16.00
Alcohol, Ethyl	gal.	....	....	4.90	5.25
Alcohol, Methyl (see methanol)					
Alcohol, denatured 188 proof	gal.	....	....	.40	.45
Aluminum sulphate, commercial	lb.	.02¼	.02½	.02¾	.03
— iron free	lb.	.03	.03¼	.03½	.03¾
Ammonium chloride, granular (white salammoniac)	lb.	.07½	.07¾	.08	.08½
Ammonium chloride, granular (grey salammoniac)	lb.	.08	.08½	.09	.09½
Barium sulphate (prec.) (blanc fixe)	lb.	.04½	.05	.05½	.06
Calcium hypochlorite (bleaching powder)	lb.	.02½	.02¾	.03	.03¼
Chlorine, gas, 100-lb. liquid-cylinders	lb.	.08	.09	.09½	.10
Glycerine, C.P. drums extra	lb.	....	....	.18	.19
Lead nitrate	lb.	....	....	.15	.20
Litharge	lb.	.08¾	.09	.09½	.10
Methanol, 95 per cent	gal.	....	....	.75	.77
Potassium bichromate	lb.	.12	.13	.13½	.14
Potassium hydroxide (caustic potash)	lb.	.09½	.10	.10½	.11½
— Prussiate, yellow	lb.	.25	.26	.27	.28
Salt cake	ton	....	....	32.00	34.00
Soda, light	100 lb.	1.95	2.10	2.15	2.40
Soda ash, dense	100 lb.	2.20	2.30	2.40	2.60
Sodium borate (borax)	lb.	.07½	.08	.08¼	.08½
Sodium Carbonate (sal soda)	100 lb.	1.90	2.00	2.25	2.50
Sodium hydroxide (caustic soda	100 lb.	3.60	3.70	3.80	4.00
Sodium prussiate, yellow	lb.	.13	.13¼	.13½	.14
Sulphur, crude	ton	18.00	20.00	....	....
Sulphur dioxide, liquid, cylinders	lb.	.08	.08½	.09	.10
Zinc oxide XX	lb.	.08½	.09½	.09½	.10

ST. MAURICE MADE MORE MONEY.

One of the most satisfactory annual financial reports issued this year by a Canadian pulp and paper company is now going forward to shareholders of the St. Maurice Paper Company, Limited, Canadian subsidiary of the Union Bag & Paper Company. The report, covering the year ended December 31 last, shows net earnings on the common stock equivalent to 22·68 per cent, or $1,769,988, as compared with 11.27 per cent on the lower capital a year ago, or $563,924. Through a stock dividend outstanding stock was increased from $5,000,000 to $7,899,900.

The net profit and loss account shows operating profits at $2,440,250 as against $1,320,621.

Gross profits totalled $2,976,646 against $1,418,804. Deductions included depreciation allowance and the setting aside of $800,000 as a contingent reserve and against Government taxes as compared with $100,000 written off a year ago.

The company's working capital position improved during the year, surplus of current assets at December 31 being $3,308,890 as compared with $2,449,891 in 1919. Inventories and expenditures on logging operations tatalled $2,863,689, an increase of nearly $400,000 over the 1920 figures, while bank loans appearing at $475,000 in the 1919 statement find no counterpart in the 1920 figures.

Properties, timber limits, equipment, etc., are shown in the statement at $8,053,038, net additions during the twelve months involving an outlay of $1,002,850. The capital stock of the company was increased from $5,000,000 to $7,899,000, the change in this respect being due to the distribution of the 30 per cent stock dividend and the exchange of all but $47,000 of the outstanding bonds, shown a year ago at $1,440,000, into the common stock of the enterprise on a par for par basis during the year.

Depreciation and contingent reserves were substantially increased, the former now standing at $1,427,281, against $1,067,101 at the end of 1919, and the latter at $871,172, compared with $246,172 last year.

The "Why" of Pulp and Paper Financing

By A. R. R. JONES.

In certain quarters, probably not very fully informed as to the facts, surprise is expressed that most of the Canadian pulp and paper companies, after a period of unprecedented progress and prosperity should now be resorting to new financing, or, in other words, that they should be borrowing new capital. But, just as there is financing and financing, so are there causes and causes for financing. There are industrial concerns that one knows of which are driven to financing in order to cover losses that have been incurred. There are other industrial concerns that would fain seek the solace of financing were it not that they are in too bad shape for any plan of sound financing to avail them anything. But far different is the case with the Canadian pulp and paper companies. They, on the other hand, are financing in order to recoup themselves for heavy capital expenditures, incurred partly out of income and partly at the expense of a fluid position. And they are fortunate in the possession of a vast margin of unpledged assets and earning power.

It must be borne in mind that it is within the last six years or so that the pulp and paper industry in Canada has developed—or, rather, has been transformed—from an industry of comparatively modest dimensions to one of enormous magnitude. Within the period named it has become the leader in the world. Thus, those six years have been years of unprecedented and unparalleled demand for the products of the industry. In order to keep pace with, and to be equal to, the demand, the leading pulp and paper concerns have spent very large sums either in adding to their timber holdings or in increasing their plant facilities or both. One company that one could name has recently spent $5,000,000 in extensions and improvements. Many other large pulp and paper concerns are in like case. The sums thus expended have been drawn directly from earnings, supplemented by bank loans. The financing, to which resort is now being made, by means of the issue of bonds, etc., is for the purpose of liquidating such bank loans and of putting the companies once more in what may be termed a fluid position. In the words of Mr. R. O. Johnson, of Messrs. Greenshields and Company, investment bankers of Montreal, with whom the writer, the other day, had the advantage of discussing the whole situation, "it is a natural and necessary sequence to a great development in a great business."

Of course, one is aware that a certain amount of criticism has been levelled at some of the companies by reason of the circumstance that, after having paid dividends of considerable size in the not remote past, they are now finding it necessary to seek new capital. But criticism of this nature does not take sufficient account of the fact that, as Mr. Johnson pointed out, in many cases, for every dollar paid out by them in dividends, pulp and paper companies have put a dollar —and more—into their properties. And, after all, as he very pertinently added, "to provide for posterity is not the whole duty of shareholders."

In corroboration of the assertion that many of the pulp and paper companies have put more than a dollar into their properties for every dollar paid out in dividends, it may be mentioned that, in the last issue of "Investment Items," published by the Royal Securities Corporation, it is stated that "it is reliably estimated that well over 60 per cent of the recent capital expenditure of the leading Canadian pulp and paper companies has been met from this source. The Spanish River Company, for example, has invested $7,000,000 in extensions since 1915, with a resultant doubling of output, and without the addition of a dollar to the Company's funded debt until its recent issue of $3,000,000 of bonds to fund about 40 per cent of this $7,000,000 of capital expenditure. Many other large pulp, paper and lumber companies are in a similar position."

One is somewhat at a loss to understand why recent pulp and paper financing should have attracted so much attention—and some of it of a not too friendly kind. After all, there is surely nothing new in the idea of selling securities, while the pulp and paper companies are extremely fortunate in having securities of such unimpeachable character to sell for the purpose of providing the working capital they need in this period of readjustment. It may be surmised that but little of the "hullabaloo" would have been raised had not certain newspapers, conceiving that they have a grievance in the price that they have had to pay for newsprint, adopted a somewhat hyper-critical, as well as narrow, attitude. In the adoption of that attitude they seem to have short-sightedly overlooked the fact that anything which tends to impede the development of the paper industry must react to their own detriment. For, the more the paper industry develops, the cheaper newsprint must ultimately become. At any rate, the financing contemplated since the "hullabaloo" has been on, is only to the extent of some $17,000,000, which, as it is estimated that about $300,000,000 is invested in the industry in Canada, is not much more than five per cent of the capital invested.

Six months ago, it was probably the general view that business in the industry would keep on at high speed pressure for quite a while longer than it actually did. The industry, in fact, probably got caught, so to speak, three quarters developed. The result is that the last quarter of development, instead of coming out of earnings, has come out of the sale of securities. In the changed circumstances of today, the sale of such securities, in order to ensure ample working capital, is financial policy of unassailable soundness. It amply justifies the market price paid for the new capital.

Moreover, there is every indication that the public are alive to the favorable opportunities offered by investments of this nature. The distribution of the securities is general all over the country and in the United States as well. The pulp and paper concerns are well in the limelight. And the fact that they are able to finance under present conditions is cogent evidence of securities at their disposal.

When all is said and done, the fundamental laws of business still stand. The ebb succeeds the flow, and the flow again, in turn, succeeds the ebb. Business is reviving again—one can see the signs on all hands—as it has always revived in the past. It was the temporary breakdown of credit that made business temporarily slack. Now, bank reserves are accumulating, credit will become available and business brisk once more. Meanwhile, their present financing will enable the pulp and paper companies to pass through what is only a temporary condition, necessarily incidental to the readjustment period, with colors flying and with credit unimpaired.

An Odd Use of Paper

A long strip of tarred paper wrapped about a wooden cylinder seems a slight foundation for concrete pilings, which must bear up many tons weight, but that is exactly how the "cores" of these pilings are made.

The device for rolling the cores is a long wooden cylinder, turned by hand, with a trough of the same length beneath filled with hot glue. The first strip of tarred paper is as long as this section of the piling is to be, and is simply wrapped about the cylinder, and glued along its free edge. The paper is fastened by wire in three places. The next operation is a long narrow strip of paper wound on as the cylinder revolves, going through a little wooden device constructed for the purpose, which winds it on diagonally very much as a bandage is wrapped about a broken arm. A man with a brush stands ready to slap on some hot glue as each lap of the paper folds down. Wire is now wound on in the same fashion from a reel, beginning at one end and finishing up at the other. Two thicknesses of paper are rolled on in this way, and wired, making three layers in all. The hollow paper cylinder



Fig. 1.—Paper cores and reinforcing wire ready for coating with cement mixture.

is then slipped from the wooden one on which it was rolled, and a wire mesh put on for reinforcement.

The cores are rolled in two sections, a long one for the body of the piling, and a shorter one for the base. A conical cap of paper is formed for one end of the base section.

The short lengths of the cores are set on a wooden platform, and fastened down. They are now ready for the first coating of cement and sand, which is applied by a large rubber hose, through a metel, rubber-lined nozzle. Air pressure of thirty-five pounds to the square inch is the power that forces the cement mixture out of the hose, water being applied at the same moment as the cement mixture. This process is known as "shooting" the piles, and has been used in making concrete buildings, barges, etc. The force with which the mixture is driven renders it very hard and flinty. A man with the hose moves all around the core, applying the cement evenly all around.

Next, comes the casing of reinforcing rods, and when it is put on, the man with the hose again gets busy, and builds up a sort of bulbous hood at the top, which will be the end resting on the ground. Rows of these sections, with their odd, mushroom-like hoods, somewhat resemble headstones in a cemetery, and are dubbed the "graveyard" by the workmen.

These sections are wheeled to the pile-moulding rack,



Fig. 2.—Building up the base section of the pile.

a sort of scaffolding to support the cores while they are being shot. Here in one of the compartments, a foundation of cement, reinforced by a section of iron rail, is made for the piling's base. The long portion is now added, reinforcing rods wired on to the base, and the shooting of the long section of the piling begins. The big hose is carried up from "story" to story of the rack, and little by little, the work is completed.



Fig. 3.—Crane carrying finished concrete piles to the curing rack.

The pilings were first placed some distance apart in the moulding rack, but as the work progressed, it was found that it was better to have them closer together, so now, six in a row are usually shot at one time.

The inventors of this sort of piling claim that the hollow core construction is more durable than pilings of solid concrete, and that cement applied in this way is impervious to the ravages of insects. It would be a hardy insect that would tackle so flinty a substance.

Another way of spelling success is application.

No use to wait for our ship to come unless we have sent one out.

ONE YEAR OF GROUP INSURANCE.

On the 21st of February 1920 the Spanish River Pulp & Paper Mills, Limited, instituted a system of insurance to cover all salaried and mill employees, and all salaried staff of the Woods Department. This insurance was placed with the Metropolitan Life Insurance Company; without cost to the employee and without medical examination.

The benefits which come to employees are based on the length of service with the Spanish River Company. As soon as a man has been employed by the Company for three months he is automatically insured for $500, and names the person to whom the amount is to be paid in case he dies. From $500 this amount of insurance increases, covering a period of ten years, until at the completion of ten years an employee is insured for $3,000 at death. At the same time the employee is insured against total disability. If an employee becomes permanently and totally incapacitated while working for the Company he will receive the full amount of his insurance in installments.

In addition to these benefits there is the visiting nurse service feature, at the Soo and Espanola. Under this plan there is available at the Soo and Espanola a registered nurse who will visit employees in case of illness when requested to do so by the employee or his family. The full benefit of this service has not been taken advantage of by the employees. Employees in the Soo who are taken ill and who are under the group insurance plan get in touch with Sister Dorothea at the General Hospital, who will immediately send a nurse to the home to give advice in the case. This nurse does not remain at the home, but makes visits as often as necessary, staying from a few minutes to several hours each visit as the case may require. At Espanola employees get in touch with the hospital, where the company nurse is always available for these particular cases. The service has not yet been put into operation at Sturgeon Falls because all efforts on the part of the Company and the Metropolitan Insurance Company have failed to secure the services of a nurse for that town.

Literature has been distributed every few months to all employees. This literature has covered various subjects in health and hygiene.

The following are the death claims which have been paid during the twelve months ending February 21st, 1921:

W. P. Cooper	Sault Ste. Marie	$ 500.00
M. Dooner	"	750.00
C. Lennox	"	500.00
J. James	"	2,250.00
J. B. Hughes	Espanola	1,000.00
G. P. Harris	"	500.00
J. Divett	"	500.00
D. McInnis	Sturgeon Falls	500.00
A. Kavanaugh	"	2,500.00
F. W. Rogers	Sudbury	2,750.00

These benefits total $12,250, which sum has been paid to the beneficiaries named by the deceased employees. The settlement of these claims, that is, the payment of these sums to the persons designated by the employees has taken anywhere from six to eight days after the necessary papers have been submitted.

Happiness depends quite as much on what we don't do as upon what we do.

SENATOR McCORMICK TO SPEAK AT BANQUET.

United States Senator Medill McCormick, of Illinois, former publisher of the Chicago Tribune, one of the leaders of the Roosevelt wing of the Republican Party in the campaign of 1912, has accepted an invitation to appear as the chief speaker at the convention banquet of the American Paper and Pulp Association, on Thursday, April 14. His subject has not yet been definitely announced, but he will discuss the relations of the paper industry and business in general to the developments of the day in the effort to bring the country back to normal conditions.

While the banquet is thus given its particular bright light, the arrangements are progressing rapidly for the regular business session earlier in the day. President Geo. W. Sisson, Jr., will deliver his address, and the report of the Secretary-Treasurer will be followed by committee reports, and then the symposium of discussions on various phases of the industry, as seen by prominent manufacturers from the different groups.

JOHN R. BOOTH AGED 94.

Ottawa, April 5.—John Rudolphus Booth, veteran lumberman and manufacturer, today celebrated his ninety-fourth birthday, and in a manner very much to



his distaste, as, owing to a cold which he contracted some time ago, Mr. Booth has been confined to his bed.

NEWSPRINT REDUCTION.

Cut of $17 per Ton Announced by M. & O.

Minneapolis, April 5.—Directors of the Minnesota and Ontario Paper Company today announced a further reduction of $17 a ton on newsprint paper to publishers.

This concession, together with that of $8.00 per ton made on January 1, reduces the price from $138, as fixed by contract until July 1 next, to $113 per ton for the next three months.

ST. MAURICE EXTENDING.

The St. Maurice Paper Co., Ltd., of Cal de la Madeleine, Que., has awarded a contract to the George A. Fuller Construction Co., Montreal, for the erection of a number of additions to its plant, including mill extension, machine shop, pattern shop and other mechanical buildings. The work is estimated to cost about $400,000 including equipment.

A FORWARD STEP IN WELFARE WORK.

The welfare building of the Laurentide Company, Limited, which was completed last summer, is another indication of the forward-looking and progressive policy of the concern. The building is the centre of all community work and serves as the headquarters for the classes in Domestic Science, for the instruction of nurses' aides, for lectures to mothers on the care of the baby, and kindred welfare work. Moreover, all physical examinations of employees of the Laurentide Company are carried on there by a physician in charge of this work, and the building is fitted with a laboratory, complete surgical equipment and an X-ray plant not excelled in the province. Everything about the building and equipment is strictly up-to-date, and no expense has been spared to provide the best obtainable. The services of the building are available to all the local physicians.

The building is destined eventually to serve as a nucleus for a modern, 50-bed hospital, which will be built within the next few years. At present, the nursing staff, provided by the Victorian Order, live on the upper floor. These nurses, six in number, use the welfare building as their headquarters and carry the ideas which prompted its erection to the members of the community they serve, to the end that better conditions of health, and in that way greater efficiency and earning power may be developed.

One of the developments of the work has been the inspection of the children of the Laurentide School. This consists of a periodic examination of the children by a special nurse, for weak eyes, poor teeth and other defects that are sometimes overlooked by parents. It is planned shortly to institute educational work against contagious disease by means of a special nurse.

A feature of the work at the Welfare building is the holding each week of an infants' clinic. This is carried on by the local physicians who instruct the mothers in the care of the children. It is hoped during the summer months to have tents where the babies may be kept, should be there need of it.



Photo—Courtesy of "The Digester."

UNIFORMITY OF DIGESTER CHIP CHARGES.

How uniform are the weights of wood in the digester charge, the unit commonly used in chemical pulp-mill operation, is indicated by data obtained in a mill-scale study by the U. S. Forest Products Laboratory. For a period of three months at a certain mill, it was possible to weigh all the chips entering one digester, to make accurate determinations of their moisture content, and so to compute the actual amount of wood substance in each charge.

The chip charges for thirty-eight cooks showed the following variation in weight, after deducting for moisture.

7 charges weighed between 11,600 and 12,600 pounds.
24 charges weighed between 12,600 and 13,600 pounds.
7 charges weighed between 13,600 and 14,600 pounds.

Fifty per cent of the charges contained between 13,000 and 13,770 pounds of chips,—a variation in weight within the limits of plus and minus 2½ per cent. Delays of more than twenty-four hours occurred in starting all the cooks with charges of more than 13,770 pounds; and since it was customary before bolting down the cover to fill with additional chips the space left by the settling of the charge, the longer filling periods account for the larger amounts of wood in these charges. The cooks with charges of less than 12,600 pounds were started without refilling after the liquor charge was added, and it was anticipated that they would be light.

The weighing experiments indicate that the digester charge is, in most instances, a reliable unit for pulp-mill operation, provided the operation is uninterrupted and the soundness and species of pulpwood do not vary.

PULP AND PAPER NEWS

E. Stewart, director of the Spruce Falls Company, Limited, denies the report in a recent despatch from the north country that 1,000 men have been discharged from Kapuskasing. He says that about 300 bushmen have been paid off as their work has been completed. The sulphite mill will not be ready for operation before about July 1. So far as possible all help has been secured from Canadian agencies. Only a few experts were brought from the United States.

In Toronto paper stock circles it was felt that the declaration of the quarterly dividend of one per cent on the no-par-value stock of the Abitibi company has cleared the air, not only for Abitibi, but for other issues, particularly Brompton, as it is thought that it indicates dividend reductions only and not the passing of distributions.

The contract between the Ontario Government and the Provincial Paper Mills Limited, whereby the company gets a pulp limit of 1220 square miles and agrees to erect a paper mill in Port Arthur, includes a clause to the effect that the mill will supply all the book paper wanted by the Ontario Department of Education for a period of twenty-one years.

A. P. Rawsthorn, until recently connected with a London paper export house, has joined the selling force of the Fred. W. Halls Paper Co., Limited, Adelaide Street, W. Toronto.

F. L. Ratcliffe, of the Ratcliffe Paper Company, Limited, York Street, Toronto, has returned from a two months trip to Bermuda and Atlantic City.

The many friends in the paper trade of Charles S. Taylor, sales representative of Ritchie & Ramsay, paper manufacturers, Toronto, are congratulating him on his marriage a few day ago to Miss Monica Wood of Oakville.

At the annual meeting of the Barber-Ellis Company, Limited, Toronto, held a few days ago the following officers were elected: J. F. Ellis, president; F. M. Ellis, vice-president; C. G. Ellis, Brantford, George Scott, Toronto; Wallace Murphy, Winnipeg; Garfield Graham, Calgary; Lorne Graham, Vancouver; H. Holt, secretary-treasurer.

The Toronto office of the George H. Mead Company, of Dayton, Ohio, which was opened in the Bank of Hamilton Building about a year ago, was closed on April 1st and L. E. L. Harvey, who for some months has been the manager, has gone to Montreal. The Canadian sales of the Spanish River Pulp and Paper Mills, Limited, which had previously been handled by the George H. Mead Company, as selling agents, will now be handled from the Spanish River office at Sault Ste. Marie. The office in the Bank of Hamilton Building vacated by the Mead Company, has been taken by T. H. Watson of the Canadian Machinery Corporation, Limited, Galt, Mr. Watson being also a director of the Spanish River Company.

According to word from Haileybury a great deal of interest is developing in that district over the report that negotiations are under way with a view to erecting a large pulp mill on the shore of Lake Temiskaming, at Dickson's Creek, about half way between Haileybury and Liskeard. It is stated that those behind the project have already advanced several thousand dollars in securing the site and an endeavor is being made to secure assurance from the township of Bucke that the fixed assessment of the plant shall not exceed $20,000 for a term of twelve years. Provided the project is carried through, it will be of vital importance to Haileybury, the county seat of Temiskaming, owing to the declining support coming to the town from Cobalt, where the number of men employed has declined nearly 60 per cent during the past year. It would also provide use for the Hydro-electric power being generated at the plants which have supplied the mines of Cobalt.

The death took place in Toronto last week of Harvey Nelson Barry, business manager of the Farmers' Sun, at the age of 60 years. Deceased had been a resident of Toronto for the past twenty years, having joined the staff of the Sun which the late Goldwin Smith was associated with.

Mr. W. L. Bulman of Bulman Bros. Winnipeg was in Montreal this week.

Gen. J. B. White, Chief Forester for the Riordon Company, states that his department has been very successful this year in getting the company's requirements for logs cut early and hauled to the landings. He says it is not time yet to worry about whether there will be sufficient water for driving.

Word is received from St. Johns, N.B. that the Paper Box Mill, established there by Clark Bros. will be in operation this week and that the Sulphate Pulp Mill of the company at Bear River, N.S., will be in operation next week.

Mr. G. C. Piche, Chief Forester for the Province of Quebec, has booked passage for France for April 21st. He will sail direct to Havre and after touring the forest regions of France and interviewing the Forest Departments, will proceed to Scandinavia where he will join some of his students who have preceeded him.

Messrs. Guay and Landry of the Provincial Forest Service, are studying aerial photography in France and Belgium in preparation for extensive mapping of Quebec forests by this method during the coming summer.

Mr. Lussier has been studying forestry conditions in France and Switzerland and is now in Scandinavia. His studies have carried him beyond the Arctic Circle in Lapland and he has obtained much valuable information and experience which will be made use of in improving forest conditions in Quebec.

Mr. Edward Beck, in charge of publicity for the Canadian Pulp and Paper Association is confined to his house this week by illness. His many friends will wish him a speedy recovery.

Technical Section

REVIEW OF RECENT LITERATURE.

B-9. Alaska the future source of newsprint supply. Paper, 9-10, 34, (Aug. 4, 1920). A discussion of the possibilities of establishing a newsprint industry in Alaska, showing that "within 5 yrs. newsprint from Alaska, should be a fairly common commodity on the market in the U. S."—A.P.-C.

F-5; H-3. Curtailing bleach consumption by adding sulfur to digester liquor (in the soda process). GEORGE K. SPENCE, Soda Pulp Committee, T. A. P. P. I. Paper, 19-21, (Sept. 8, 1920); Pulp & Paper, **18**, 1039-40, (Oct. 7 1920). The data and results of 35 exptl. cooks in which no S or Na_2S was used and of 35 exptl. cooks in which 1.1 lb. of S was used per 100 lb. of stock cooked are given. The use of 1.1 lb. of S in the liquor resulted in a saving of 0.92 lb. of 35% bleaching powder. If this were the only virtue to be considered there would be very little advantage in its use under normal conditions. As it is claimed, however, that the use of S increases the yield and strength of stock, this will be investigated.—A.P.-C.

K-6. Pitch in waste paper stock. THOMAS F. HEBERLY, Schmidt & Ault Paper Co., York, Pa. Paper, 12, 48, (Sept. 22, 1920). Description of the trouble and harm caused on the paper machine by pitch and asphaltum from waste container board and impregnated paper. So far the only remedy has been to cull out that grade of paper; but this is not always an easy thing to do. A reclaiming process is being perfected; but this will entirely destroy the paper and reclaim the insulating and waterproofing materials.—A.P.-C.

K-9. The use of China clay in tinted papers. China Clay Trade Rev. Paper, 22 36, 46, (Sept. 22, 1920). A discussion of the important function China clay performs by combining with dyestuffs in the beater, thereby preventing mottling.—A.P.-C.

K-10. Substitutes for alum in paper sizing. W. E. BYRON BAKER. Paper, 16, 30, (Sept. 29, 1920). Sizing paper in the beater depends upon the decomposition of rosin size soln. in the beater by the action of a soln. of an acid or a salt containing a large proportion of acid in a neutralized form. The decompn. of the size soln. consists of the liberation of free rosin in a finely divided condition, which takes place because the soda in the size soln. has a stronger affinity for the strong mineral acid in the pptg. agent. The bulkier the size ppt. the better will be the distribution of a given wt. of size (rosin) among the fibers in the beater. The bulkiness of the ppt. produced is therefore as important in the selection of pptant. as its size pptg. power. Alum produces the bulkiest ppt. because of the affinity of the basic Al compds. for the water, and their ability to form highly colloidal and gelatinous ppts. by absorption of water; and its size pptg. power is good as it contains abt. 40% SO_3. As a substitute for alum one of the best procedure is the use of niter cake ($NaHSO_4$) to replace half the alum. If used alone it will not produce nearly so bulky a ppt., so that to size to the same desired sizing strength it may be found necessary to increase the amt. of size per t. Half as much H_2SO_4 as $NaHSO_4$ may be used, but it does not produce so bulky a ppt. as the latter. With some pulps it is impossible to get so hard sized paper with H_2SO_4 or $NaHSO_4$ as with alum; and there is little doubt that in such cases the basic Al resinate assists considerably in obtaining the desired effect. $FeSO_4$ causes discoloration of the paper (either through combination with residual lignocellulose in unbleached pulp, or with the rosin when using bleached pulp) and impairs the strength of the sheet due to alternate oxidation and reduction of the Fe by atmospheric influences, resulting in the destruction of the cellulose by the formation of oxycellulose. $MgSO_4$ and $ZnSO_4$ form bulky ppts. and have a slightly lower pptg. power than alum. They leave a neutral "back water" in the beater, which is specially useful—when using viscose in the size. Certain other sol. sulfates, the chlorides of the above metals, or HCl could also be used, but they are more expensive and no more efficient.—A.P.-C.

K-12. Changing light to heavy sheets. World's Paper Trade Rev.; Paper 10, (Sept. 15, 1920). Get the correct speed by careful timing and not by guess work. The quality of stock and formation of the paper must be carefully considered. If the stock has a tendency to be slow, always heat the stock and water quite hot before starting up. After starting see that the stock is working without undue strain on the suction boxes, then the steam may be gradually shut off. Start without any weights on the couch rolls and do not be in a hurry to put the shake on; wait until water and stock are well regulated. Do not start up too heavy. Start up at least 30 lbs. light to get an idea how the stock is going to act; then regulate the water, steam, slices, etc., accordingly, bringing the paper gradually up to wt. Suction boxes should be equipped with automatic relief valves, to prevent injury to the wire, or possible ripping it off.—A.P.-C.

K-12. Papermachine shutdowns: causes and effects on production. Papeterie, **42**, 641-5, (July 25, 1920); Paper, 19-20, (Sept. 15, 1920). Translation by A. Papineau-Couture.—A.P.-C.

K-12. A new fireproof hood for papermachines. F. M. WILLIAMS. Paper, 12, 30, (Sept. 29, 1920). Wood as a material for hoods for paper machines constitutes a fire-hazard, rots readily, shrinks and swells and opens up cracks which destroy fully or in part its function as a collector of moisture, and has to be renailed relatively frequently as the nailheads rust off. Iron or steel rusts quickly and sheds dirt on the paper unless it is continuously painted. Asbestos lumber is free from all these defects, and is used by the author for the manuf. of hoods which are made in the factory and can be assembled over the machine in a short time.—A.P.-C.

K-12. A new felt-cleaning device. C. A. WOODCOCK. Pulp & Paper, **18**, 934-4 (Sept. 9, 1920); Paper, 20, 28, (Sept. 29, 1920). Clear water or a soln. of a suitable cleansing substance is supplied to either side of the felt, preferably—for the average mill—the dirty side or that side which comes in contact with the web, to loosen the foreign material deposited thereon.

Thereafter a suction effect is applied to the dirty side of the felt to open the meshes and remove the water and material which has been freed thereby. Figures are given from actual mill production with and without the device to show the increase in output and saving in fuel which can be effected by its use.—A.P.-C.

K-12. The life and use of fourdrinier wires. Paper, 15, (Sept. 29, 1920). A plea for cooperation between the papermaker and wire mfr. The greatest abuses of wire are: excessive use of acid, misalignment, excessive suction.—A.P.-C.

K-12; M-5. Repair hints. Paper, 28, (Sept. 29, 1920). Hints on repairing holes in the surface of roll coverings made of rubber, mahogany, drying cylinders, wet felts, wires, jackets, bronze and other metal rolls. —A.P.-C.

K-21. Waterproof material. Tarred roofing paper. Can. patent No. 203,762. The Barrett Co., New York City, Assignee of RAY POTTER PERRY, Upper Montclair, N.J., Sept. 7, 1920. The process of producing a construction material which comprises the steps of forming a thin sheet of mixed fibrous and comminuted waterproofing materials on a paper-making machine, superposing a plurality of said sheets on each other, and subjecting said sheets to heat and press. so that the bituminous material becomes fused and the sheets firmly united. Claims allowed 14.—A.P.-C.

K-21. Insulating material. Can. patent No. 203,764, The C. F. Burgess Laboratories, Assignee of HOWARD F. WEISS, Madison, Wis., U.S.A., Sept. 7, 1920. The method of mfg. composite insulating material which comprises shredding fibrous material, depositing the fibers on a support to form a layer of the desired thickness, subjecting the layer of deposited fibers to suction, treating the fibers with an adhesive to cement them together, drying the mat thus produced, and cementing to each surface of the mat thus produced a sheet of fabrics. Claims allowed 13.—A.P.-C.

K-21. Felt. Can. patent No. 203,765, The C. F. Burgess Laboratories, Assignee of HOWARD F. WEISS, Madison, Wis., U.S.A., Sept. 7, 1920. As an article of manuf., a felt comprising a compressed fabric of wood fibers in which the fibers are cemented together by a water resistant adhesive and prior to the compression were cemented together in heterogeneous arrangement with the fibers extending in all 3 cubical dimensions. Claims allowed 10.—A.P.-C.

K-23. Treatment of fibrous material to render it substantially non-absorbent and non-conductor. Can. patent No. 196,117, WM. WEIMAR, Appleton, Wis., U.S. A., Jan. 13th, 1920. The material (wood or the like) is immersed in a hot satd. NaCl soln., removed, superficially dried, cooked in a soln. of S and resin with the S maintained at its boiling point, then removed from the latter soln. and quickly cooled. Claims allowed 4. —A.P.-C.

K-23. Machine for impregnating paper. 140,861, C. W. MAYER, Rochester, N.Y., U.S.A. (Same as Fr. patent No. 497,476). To provide improved means for saturating the web with any desired substance capable of being forced into the paper while using the minimum amount of substance. A further object is to saturate webs of the lightest tissue with the minimum amount of saturating material. A further and important object is to provide full control at all times with reference to speed pressure and amount of saturating material employed.

K-24. Cover for rolls of paper, etc. Can. patent No. 203,629, EMIL GAGENBERG, Dusseldorf, Germany, Aug. 31, 1920. A paper roll provided with a cover that extends over the face of the roll and is provided with a pair of inwardly turned flanges that extend over the ends of the roll, each of the flanges being formed of a plurality of folds, and with a hardening adhesive carried by the cover, and adapted to stiffen the flanges and fix the folds thereof. Claim allowed 1.—A.P.-C.

L-5. Paper bottle. U. S. patent No. 1,342,769, A. J. SELZ, Assignor to Paper Bottle and Can Co., Inc. Wilmington, Del., U.S.A. A paper bottle of a single blank having a rectangular bottom, 2 oppositely arranged vert. bottom flaps projecting from the bottom and 2 pairs of oppositely arranged vertical overlapping side members, and folds extending partway the length of the bottle to gradually decrease the size of the upper part of the bottle to its stop. Claim allowed 1.—A. P.-C.

L-5. Artificial silk manufacture in Poland. U. S. Com. Rep., July 28, 1920; J. Soc. Chem. Ind., **39**, 322R, (Sept. 30, 1920). It is stated that the artificial silk factory at Tomaszow, established some yrs. before the War, will shortly start work again. Great obstacles have been met with in restarting the factory owing to the shortage of the raw materials required viz., cotton, ethyl alc. ether and H_2SO_4 and HNO_3. The prewar daily output was 1500 kg., and it is now proposed to start producing about 500 kg. a day.—A.P.-C.

L-5. Artificial silk industry in Italy. U. S. Com. Rep., July 26, 1920; J. Soc. Chem. Ind., **39**, 322R, (Sept. 30, 1920). It is announced that the Societa di Navigazione Italo-Americana, which recently increased its capital and extended the scope of its activities, will shortly construct several new plants for the manuf. of artificial silk, which will probably be located at Turin, Naples, Orbassano and Bra, and it is expected that at least 10,000 workers will be employed. The S. N. I. A. Co. through the controlling interests which it holds in the "Cines Seta Artificiale" Co., the "Viscosa" Co. of Pavia, and the "Societa Italiana della Viscosa" of Turin, already holds the dominating interest in the Italian artificial silk ind.—A.P.-C.

L-5. The artificial silk industry in Belgium. C. LEMAIRE. L'Age de Fer, **36**, 312-3, (May 10, 1920). Before the War Belgium produced one-quarter of the total world production of artificial silk, and its present production is 32% lower than in 1914. The principal works are at Tubize, Obourg, Maransart, and Alost, and employ about 6,000 hands. The 3 first-mentioned works employ the Chardonnet process (Cellulose nitrate), and the fourth uses the viscose process. This latter process is shortly to be started in the Tubize and Obourg factories. Owing to economic conditions the ind. is laboring under severe handicap as regards its equipment and its raw materials; but nevertheless it is fairly prosperous at the present time. An investigation of the hygienic and sanitary conditions of one of the principal works has shown conclusively that the shops and buildings are all that can be desired in this respect, and that what slight traces of ether and alcohol vapors do get into the room are not present in sufficient quantities to affect the health of the workers in any respect.—A.P.-C.

M-9. Cost of operating motor trucks. Paper, 26, (Sept. 15, 1920). An analysis of truck-costs, based on the ton mile as divided between gasoline, lubricants, tires, repairs and sundries, depreciation, chauffeur, license, insurance and taxes, storage, and interest on the total investment in the vehicle.—A.P.-C.

UNITED STATES NOTES

Officials of the American Writing Paper Company, as well as the company's entire office staff, have accepted a cut in salaries ranging from 5 to 20 per cent. The schedule embracing these cuts went into effect April 1st, barely a month after a similar reduction for the operators' wages.

The regular quarterly payment on the preferred stock of International Paper Company was declared last week. There has been talk that a dividend on the common might be authorized in view of the company's excellent earnings last year, which were at least equal to those for 1919 when net was equal to $13.24 a share on the stock.

Representatives of the country's book and job printing shops, in Cincinnati, Ohio, last week, launched a national organization of employing printers, operating both closed and open shops. This association is to be known as the National Forty-eight Hour League of America. Resolutions were passed unanimously pledging that all shops represented by the association absolutely refuse to accede to any demands from any labor union, at any time to operate their shops on the basis of a work week of less than forty-eight hours.

According to a report given out in Washington last week, based on a statement from an authoritative source, the new tariff—schedules of which are now being prepared by sub-committees of the House Ways and Means Committee—will place lumber, with few exceptions, on the free list. Wood pulp, it is stated, will be allowed to enter the United States free of duty, provided there is no evidence of retaliation by Canada following the enactment of the proposed tariff. Sub-committees dealing with these schedules, are said to have tentatively agreed that lumber, with three or four exceptions, shall be duty free. The exceptions include rough fir, spruce and cedar shingles and logs, which come into competition with the markets of Oregon and Washington. There will be many ad valorem duties on the bill because of the unsettled condition of the world markets, which makes it difficult and in many instances impossible to enact specific duties. Present indications are that the bill will not be ready for presentation to the House much before July.

The New York Tribune last Saturday printed a special despatch from a correspondant in Germany telling of a proposed increase in price of print paper amounting to nearly double the present cost and approximately 20 times the pre-war figure. Newspaper publishers are protesting against the proposal, asserting that any such increase would be ruinous to their business. The publishers throw the blame for the proposed increase upon the government and the Reichstag. They declare that any advance in the price of newsprint would be unjustifiable at a time when overproduction is burdening all parts of the world and when the German paper mills are making unheard of profits.

Frank E. Dunaway of 501 Fifth Avenue, New York met with a serious accident in Atlantic City Monday March 28th, having fractured his knee cap of right leg. He met with a similar accident August 22, 1917, at that time having fractured knee cap of left leg. Mr. Dunaway will return to New York as soon as he is physically able to be moved to The Broad Street Hospital.

LEAVE A. W. P. FOR NUERA.

The Nuera Paper Company, Inc., Hadley, N. Y., now has the services of four men recently with the American Writing Paper Co. Mr. W. J. Blackley is to be General Sales and Publicity manager, with Mr. C. H. Blackley as his assistant. Mr. Walker will look after the manufacturing end, with Mr. Bush as his assistant.

Mr. Walker has been connected with the paper business for the last twenty-five years, during which time he was connected with the Chemical Paper Company, Holyoke, Mass., Taylor-Logan Company, Holyoke, Mass., and the Erving Mills at Erving, Mass. For the last year and a half he has been superintendent of the Crocker Division of the American Writing Paper Company, and for the last year has been superintendent of both the Crocker and Albion Divisions of the American Writing Paper Company.

Mr. Bush, prior to his connection with the American Writing Paper Company, was with the Chemical Paper Company, Holyoke, Mass.

Mr. W. J. Blackley was with the Niagara Paper Mills, Lockport, N. Y. from August 5th, 1909 to February 13th, 1919, when he joined the American Writing Paper Company, 1919 as a member of the Sales Department, and at the time of his resignation was manager of the Specialties Section, Dept. of Sales.

Mr. C. H. Blackley was for nine years connected with the Fibre Corp., Lockport, N.Y., first, as superintendent of the Conduit Department and later as superintendent of the Hard Fibre Department.

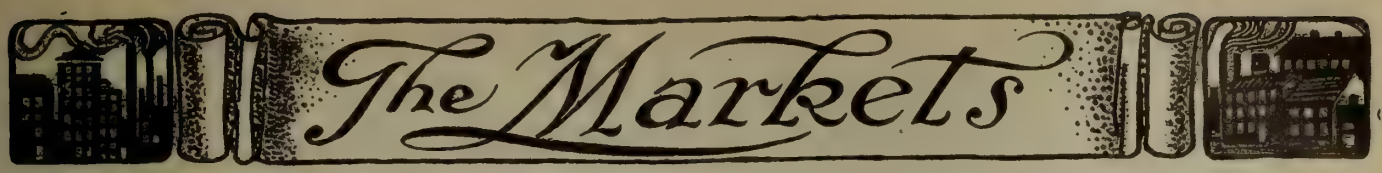
The Nuera Paper Company has at present two Fourdriniers and one cylinder machine. Foundation for a fourth machine is laid and part of the machine is ready. It has not been decided as yet whether to install a cylinder or Fourdrinier machine.

The Nuera Paper Company will manufacture colored specialties and plans later on to have two or three stock lines of cover papers.

P. T. DODGE ON NEWSPRINT PRICES.

New York, April 5.—President Dodge of International Paper Company, believes paper prices must stay relatively high for a year or more. This should indicate good earnings in 1921 if the prediction of Mr. Dodge is correct. Traders are looking forward with interest to the forthcoming annual report. It is claimed the company last year earned more than $60 a share on common before charges. Therefore the amount the company will charge off for amortization and depreciation will be interesting. Estimates as to balance available for common stock last year ran above $30 a share. Depreciation item will be main factor in determining earnings for 1920.

If you know a printer who shows himself more anxious to work out a successful answer to your problem than to quote the lowest price—Go to him. His is the real bargain.



CANADIAN TRADE CONDITIONS.

Toronto, April 2.—Unchanged conditions, generally speaking, with further reductions in some lines of paper, have marked the Canadian pulp and paper trade during the past week. There has been no real improvement in business, although the fact that what orders are being placed carry with them a request for immediate shipment would indicate that stocks are fast reaching a point where they have to be replenished. Mills are out after business in lines of both pulp and paper and in no department can orders be had without hard digging. The market for paper still shows a downward tendency and pulp is being offered at lower prices than have hitherto prevailed, although few transactions are being recorded, and there is no stable market. It is stated by one man in close touch with the pulp situation that bleached sulphite is being called for somewhat more freely. The fact that a few months ago the commodity began to show a sharp decline in price is not taken as any sign of a collapse in the industry but merely as a seasonable and timely incident as part of the changed condition in manufacturing circles in Canada generally. It is stated that orders are beginning to come in a bit more freely now and manufacturers are anticipating increased business. It is also significant that there is now growing up a demand for sulphite for the manufacture of a certain quality of silk, from which is manufactured probably the greater proportion of such articles as stockings, ties, etc. now being sold. In view of the fact that these silk mills are operating actively at the present time, it should mean that sulphite will have an additional field for use which will add considerably to its demand. While some of the pulp mills are operating light, it is stated that such institutions as the Riordon Company are running at very nearly capacity, which is taken as a sign of the healthy condition of the industry.

KRAFT PAPER.—Kraft pulp is still quoted at $80 a ton, with kraft paper at 10c a pound and the demand is still light. It is stated, however, by a man in close touch with the kraft market that there have been indications of a loosening up process and that some orders are beginning to come in for immediate delivery, which is taken to indicate that the market is bare of supplies and that the demand for this class of paper is likely to show an increase very shortly now.

TAG MANILA.—This line of paper is being handled in limited quantities and the market is still considerably off and the demand quiet. The price to the jobbers is 7½c. as against 12½c. at the first of the year. Envelope manila, which was 14½c. at the first of the year is now quoted at 10c.

BRISTOLS.—Bristols are down 4c a pound, with a price of 10½c. to 16c. to jobbers, according to grade, as against 15½c. to 25c., which prices prevailed at the beginning of the year. There has been very little reduction in cover papers which range from 13c. to 23c., the top price three months ago being in the vicinity of 25c. a pound.

COATED PAPER.—Coated paper mills are fairly busy and have, perhaps, been less affected by the paper slump than most other paper manufacturing lines. One or two of the mills report a satisfactory volume of business ahead in unfilled orders and a few of them are under the necessity of stocking up the product of their machines. There has been some slight readjustment of prices to the jobbers during the past few days. No. 1 coated is now 18½c.; No. 2, 17½c.; tints and colors 19c.

WRAPPING PAPERS.—The wrapping paper trade continues to be dull and the mills are hot after business. It is believed that the consuming public is close to the point where it has to buy paper. This is indicated by the character of the orders coming in, which are small in bulk but are invariably accompanied by requests for immediate shipment.

ENVELOPE TRADE.—Envelope manufacturers are complaining of a considerable falling off in trade since the paper slump set in and that a comparatively small volume of business is being done. A leading manufacturer expresses the conviction that the present high postage rate on letters is responsible to some extent for the lessened demand, combined with the general drop in paper, and he is inclined to the belief that the reinstatement of the old penny postage would greatly stimulate the envelope business if the Government could see its way clear to forego the collection of the extra cent.

TISSUES AND TOILETS.—The week has seen a drop of 15 per cent in tissue paper and 10 per cent in toilets. There has been little improvement in the volume of sales recently, which continues to be comprised of small lots with big orders at a premium. Business generally in this department of the paper trade is dull and the mills are digging for business in company with the jobbers. Manila tissue, 24 x 36-12 is now quoted at $1.45; 20 x 30-8½, $1.05; No. 1 white, 24 x 36, $2.15; 20 x 30, $1.55; ten-pound cap, 24 x 36, $1.65; 20 x 30-7, $1.15.

.. NEW YORK MARKETS.

New York, April 2—(Special Correspondence)—Notwithstanding that some improvement in demand for several grades of paper is reported, the market as a whole remains in a very quiet condition. Buyers in general are operating in cautious fashion, confining their orders almost solely to paper directly required, and with most consuming trades experiencing unusual dullness, the need for paper of any kind is far below normal proportions, with the result that current demand does not commence to approximate that of more ordinary times when general business is better than it is today.

Certain grades of fine papers are reported moving in a little larger volume. Obviously the demand for writing paper at present runs mainly toward the cheaper qualities, and it is these lines that are sought by printers and stationery manufacturers in somewhat increased quantities. It is also stated by some members of the trade that tissue paper is in better call and that recent sales have involved slightly larger amounts than previously. The flurry of demand for these kinds of paper, however, has not changed the tenor of the

market. Most grades of paper are moving in very light volume. Spot demand has almost disappeared, and were it not for contract business, activity in most branches of the trade would be close to a standstill.

As an apt illustration of the condition prevailing at mills, announcement was made this week by one of the large paper mills in Maine of the first curtailment in working hours since the plant was built 15 years ago, the operating schedule being reduced to four days per week. Reports from various parts of the country tell of increasing curtailment of paper production; this being made necessary by the light demand for paper and the refusal of manufactures to pile up additional stocks of their product under present unfavorable and uncertain market conditions. It is authoritatively stated that the average paper mill in the United States has sufficient stock of finished material on hand to supply a month's normal demand, and few or none of them are willing to augment these stocks while being so much in the dark as regards what the future will bring forth.

If anything, the market for newsprint is growing worse instead of showing improvement. There is very little demand for print paper for spot delivery; in fact, reports have been heard of some publishers endeavoring to resell a part of their contract supplies because of the decrease in consumption and their resultant lack of need for all paper they have bought on contract. Offerings of imported newsprint are being made at startlingly low prices. At least one sale, involving 100 tons of foreign newsprint, was recorded several days ago at 3.50 cents per pound ex the warehouse in this country. Moreover, this paper was of Swedish manufacture and compared very favorably in quality with domestic and Canadian newsprint. As would be inferred by this transaction, there are quite a few distress lots of imported print paper in the hands of importers or others who are letting go of stocks for whatever can be realized from buyers. This naturally affects the market for domestic newsprint and publishers are repeatedly insisting on further cuts in price before they will place orders. It is difficult to say just what is the spot value of newsprint. Domestic roll news for spot shipment can be bought at 5 cents per pound, and, in all probability, at substantially less. There has been no further change reported in contract quotations.

Sales of No. 1 domestic kraft wrapping at 7.50 cents a pound at mills have been noted, representing a slight decline. Tissues hold fairly steady at about $1 per ream for No. 1 white, with No. 2 white and No. 1 manila quoted at around 85 cents a ream. Book papers are in an easy market position with mills quoting at a basis of about 8.50 cents per pound on machine finished book but with the probabilities in favor of buyers securing some supply at further concessions.

Boards are in dull demand and there is scarcely a mill in the country, according to reports, that is operating more than 50 per cent. of capacity. Plain chip board is freely offered at $30 per ton f.o.b. mills and is meeting little worthwhile demand, while news board is bringing only in the vicinity of $35 a ton at mills.

GROUND WOOD.—Sales of mechanical wood pulp have been reported this week placing prices on new low levels for the present downward movement of values. Prime spruce ground wood for prompt delivery has sold at $35 per ton f.o.b. grinding plants, it is stated on good authority that this is about all consumers will now consider paying. There is a very limited demand for ground wood. Newsprint mills are doing little or no buying, board manufacturers are absorbing supplies in spasmodic fashion and in light tonnage, and other consumers are keeping mostly out of view as buyers. The result is that those producers attempting to market pulp find that they must accept almost any price offered in order to effect sales. Moreover, there is little indication of improvement in the market until activity in the paper trade broadens, because papermakers seem determined not to absorb raw material until their actual requirements necessitate their doing so.

CHEMICAL PULP.—The market for chemical wood pulp is decidedly quiet and quotations are irregular and on a broad range. There is no such thing as an established market price on any grade of pulp today. Producers quote one price, and invariably accept a much lower figure when customers make counter offers. Sales have been reported within the past several days at surprisingly low levels, and while the cases cited may be the exception rather than the rule, they at least indicate how cheaply some buyers are getting pulp.

Foreign bleached sulphite has actually sold on spot in New York at 6 cents per pound ex warehouse for strictly No. 1 pulp, while a sale of domestic sulphite of book paper quality at 3.75 cents f.o.b. producing mill has been noted. News grade sulphite of so-called No. 2 grade is being offered at 3 cents a pound and yet dealers claim that this pulp is of identically the same quality as No. 1 news sulphite, for which manufacturers ask 3.50 cents. Kraft pulp is quotably lower at between 3.25 and 3.50 cents a pound for No. 1 domestic and 3.50 cents for Scandinavian kraft, while business has been done in southern pine kraft pulp down to 2.75 cents. The quotable basis on domestic No. 1 bleached sulphite is around 6.50 cents a pound at mills, but with foreign bleached sulphite available at 6 cents, it is obvious domestic manufacturers are experiencing difficulty obtaining more than this figure for their pulp.

RAGS.—The cotton rag market is characterized by a dull condition similar to that existing in other papermaking raw material lines. Demand from consumers is unusually narrow, and those few mills operating as buyers are absorbing on the whole but negligible amount of rags. Prices are very uncertain, and they play but a minor part in the consummation of business under prevailing circumstances. If a paper mill needs stock it comes into the market and buys the rags wanted, paying close to the prices dealers ask; if consumers are not in need of rags they cannot be prevailed upon to absorb supplies regardless of the figures quoted by sellers. Dealers themselves frankly say they are not aware what rags are worth owing to the light volume of business current and the lack of an established price basis on any grade.

New white shirt cuttings are offered at 12 cents per pound f.o.b. shipping points without attracting buyers, while new washables are available to mills at 6 cents at shipping points, new light silesias at 7.75 cents, fancy shirt cuttings at 8 cents, blue overall cuttings at 8 cents, unbleached muslins at 11 cents and white lawns at 11.50 cents. Old No. 1 repacked whites are quoted at around 7 cents, thirds and blues at 2.50 to 2.75 cents and roofing rags of No. 1 quality at 95 cents to $1.



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INQUIRIES SOLICITED

PAPER STOCK.—Prices on old papers have continued to recede in a market devoid of important trade activity. Old No. 1 books and magazines have sold to mills at one cent per pound f.o.b. New York, No 1 old kraft paper at 1.60 cents, white blank news cuttings at 1.65 cents and No. 1 soft white shavings at 2.25 cents. Folded newspapers have been purchased by board mills at as low as 45 cents per hundred pounds at shipping points, and the slight buying of No. 1 mixed papers has been mostly at a price basis of about 30 cents a hundred. The market as a whole displays exceptional dullness. Consumers are said to be buying in lighter volume than the present generation of paper stock dealers can remember, and indications are that were it not for the fact that prices already are at considerable below the cost of production, they would go a good deal lower.

OLD ROPE AND BAGGING.—A little demand exists for old manila rope at a price of around 4 cents per pound for No. 1 rope at shipping points, and mixed strings are moving in scattered directions at about one cent per pound, but old bagging is in a dormant market condition and is strictly nominal in value. Dealers quote around 1.25 cents on No. 1 scrap bagging and about 1.50 cents on gunny but very few orders are materializing.

News From Our Advertisers

Ball Bearings for grinders and Jordans.

The elimination of power and oil wasting friction is one of the principal problems of the mill operator. Ball bearings are being constantly more widely used.

Fig. 1 shows the application of S K F ball bearings to a pulp grinder. This design is arranged with a wide felt groove, a grease groove and a water flinger to protect it from the intrusion of water or any other liquid.

The self-aligning feature of the S K F bearing which is well brought out in this drawing provides for any spring or disalignment. The elimination of friction on these bearings is considerable, the amount of the heavy loads carried and the freedom from heating and constant replacement, which is necessary when wood or water cooled bearings are used.

Fig. 2 (on page 392) shows the bearing lay-out in detail for Jordan engine application.

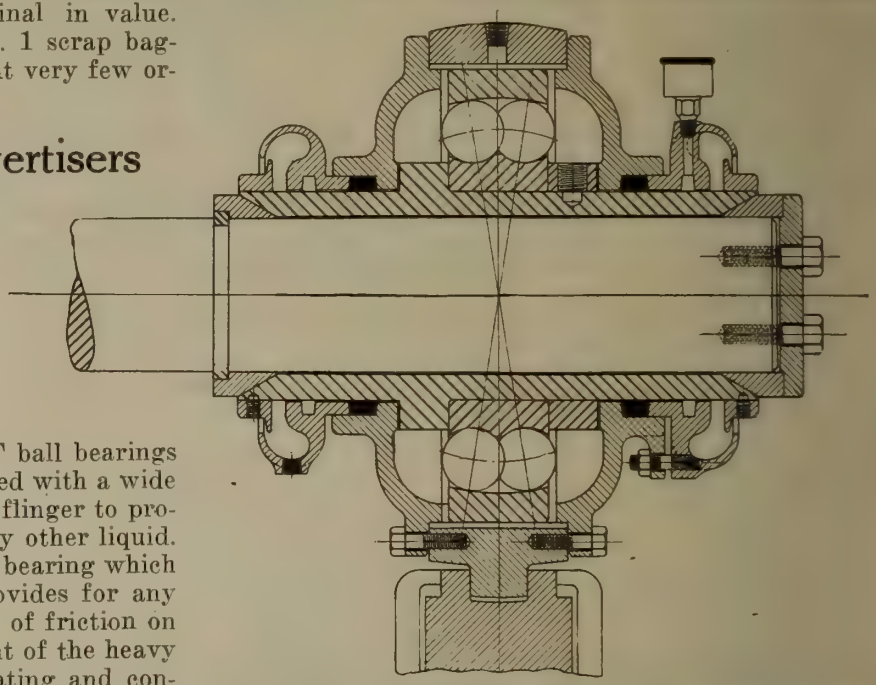
The high speed of this machine, together with the heavy loads carried, uses up a great deal of power in a plain bearing, roughly 30% more power is available in a ball bearing machine than a plain bearing. The speed can be increased and the results have shown that a great increase can be made in the stock fed into a ball bearing Jordan. The plug is held absolutely in the centre of the shell, which means a very uniform stock of great fineness, besides the saving in lubricant and attention.

The heavy type radial bearings are shown to carry the load, and the double row self-aligning thrust bearing to take the end thrust.

The application is adjustable endwise, and the housings are sealed to keep out injurious liquids.

RECORDS COMBUSTIBLE FLUE GASES.

A new departure in combustion control devices is described in an illustrated bulletin recently issued by the Mono Corporation of America, 25 West Broadway, New York City. The Duplex Mono, as it is called, is unique in that it automatically analyzes and records



the combined percentages of three combustible gases (CO, CH_4 and H_2) during all such times as any or all of these appear in the flue, while it also produces a continuous accurate record of the percentage of CO_2. Both records are on one and the same chart. This is of a

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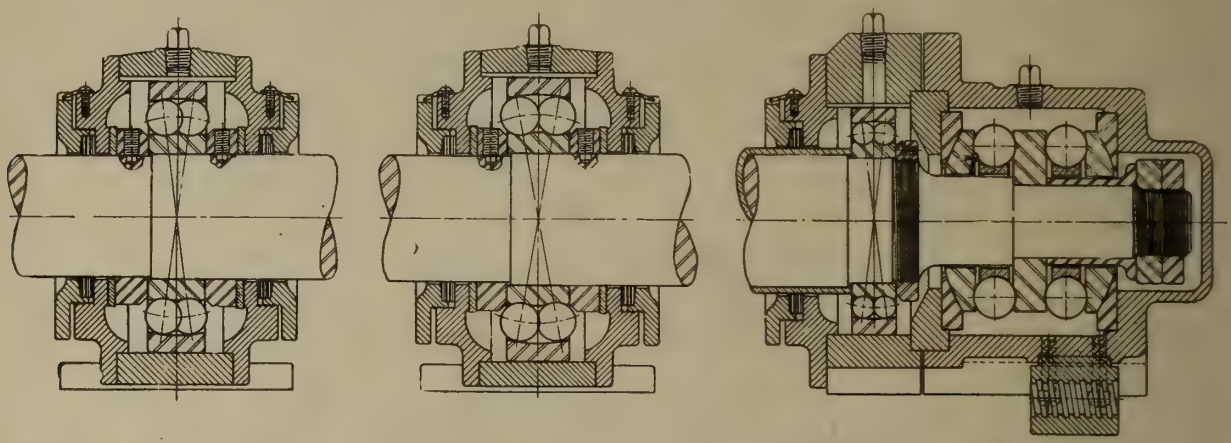
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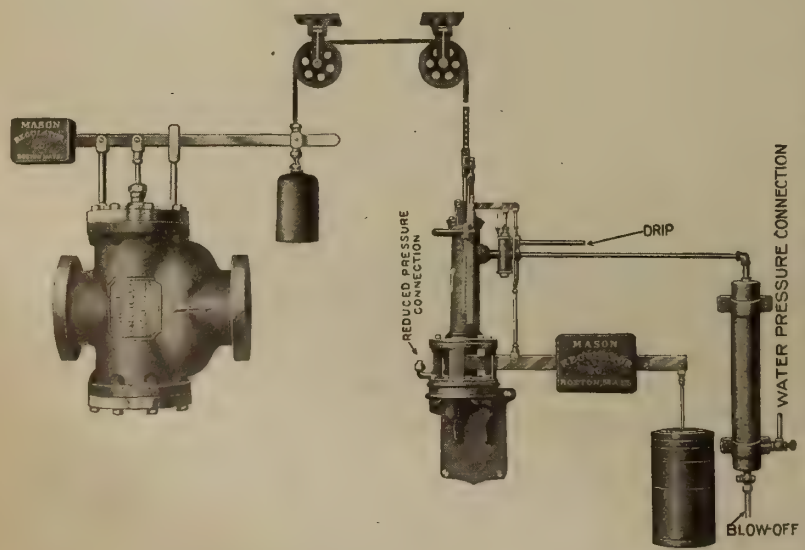
new type, and very clear and easy to read. The bulletin emphasizes the serious losses which frequently occur in boiler plant furnaces on account of the escape of unconsumed combustible gases. This may occur at any time, but happens especially when high CO_2 records are attempted under the guidance of flue gas analyzing instruments recording CO_2 only, even when supplemented by an occasional snap test for CO. With the Duplex Mono as a guide, the fireman soon learns to regulate his fires and drafts to avoid the escape of combustible gases while holding CO_2 at the highest possible percentage at all times. Should combustible gases appear when the percentage of CO_2 is less than the allowable percentage at which experience with the particular furnace in question has proven it possible to operate under any set of conditions, he knows there is something wrong requiring immediate attention. The plant executive is given a permanent record which gives him the data necessary to compute the degree of efficiency attained in firing, and offers him every opportunity to intelligently select his fuel, make alterations or repairs, and supervise the efforts of the firemen.

EXHIBITION IN LONDON FOR PRINTING, PAPER, BOOKBINDING, AND ALLIED TRADES.

Under date February 25, Trade Commissioner Harrison Watson, London, writes as follows: "The organizer of the Printing, Paper, Stationery, Bookbinding, Boxmaking, and Allied Trades' Exhibition which is to be held at the Royal Agricultural Hall, London, from April 30 to May 14, desires the exhibition and congress to be brought to the notice of Canadian printers, lithographers, bookbinders, newspaper proprietors, etc., in the hope that some may be over in England at that date and will attend the congress.



SPECIALLY ADAPTED TO PAPER MILLS



Mason Combination Reducing Valves are designed to reduce and maintain an even pressure of steam, water or air, regardless of the variation of the initial pressure or of the volume of steam, water or air required. When the initial pressure is below that for which the reducing valve is adjusted, the reducing valve remains wide open and permits the use of whatever pressure there is available until the initial pressure rises above the pressure for which the reducing valve is adjusted, when the reducing valve partially closes and assumes the proper position to supply the volume required to maintain the reduced pressure, for which the relucing valve is adjusted.

An installation of this character has been found to possess several advantages over the self-contained style of reducing valve, as the valve in the steam line is a simple Balanced Valve of heavy design and not liable to derangement, and in case of necessity it can at any time be opened and the pressure maintained by hand.

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A Necessary Protection
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A Pail that is made for just one purpose—to afford real fire protection at little cost.

A Pail that will be where you want it when you want it—its construction necessitates its being placed in a rack or on a hook when not in use.

Made of Indurated Fibreware, light, rust proof and durable as steel.

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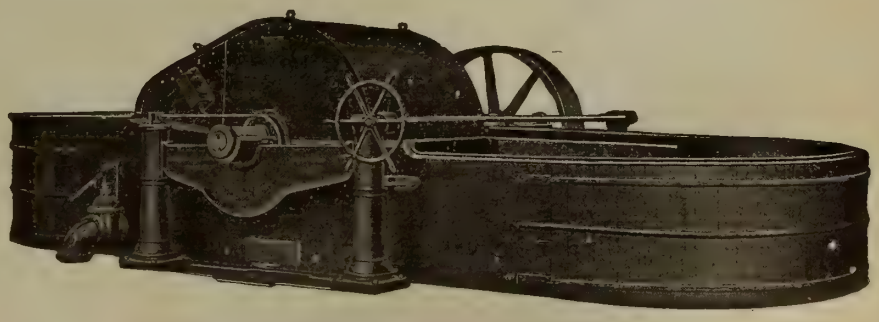
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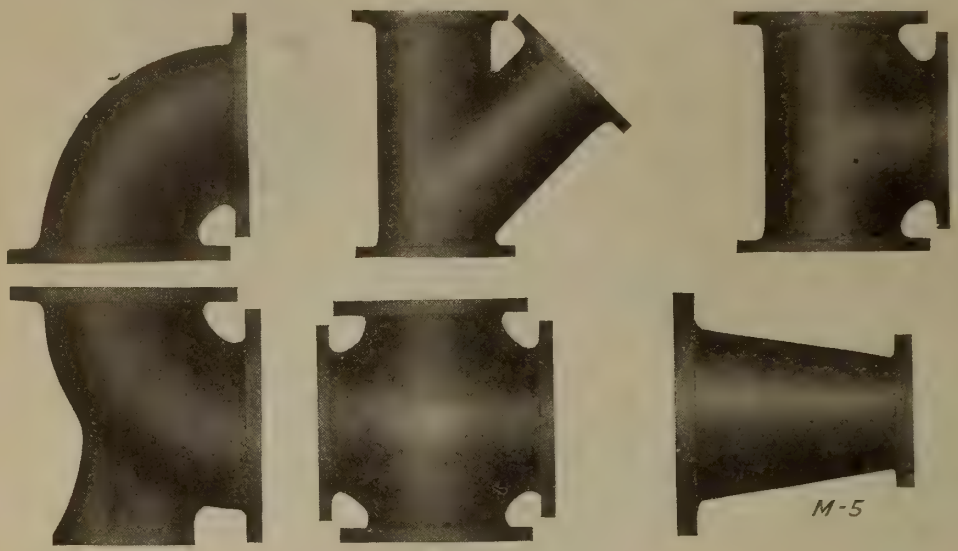
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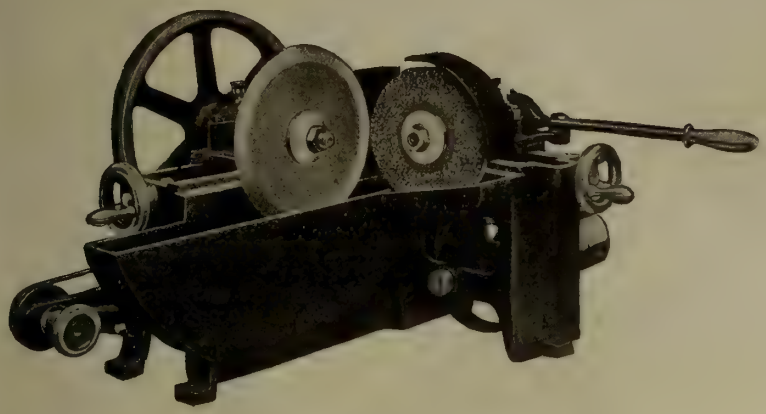
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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. **GARDENVALE, P. Que., April 14th, 1921.** **No. 15**

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal,
'Phono Uptown 7773.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

RIVALS OR PARTNERS?*

Mr. Toastmaster, members and friends of The Association that Puts the Pep in the Industry.

Your secretary is certainly a Keen un (Keenan). He sent me the usual announcement of this affair and I put my mark in the proper space on the postcard and sent it back. His next move was to say, "I am pleased to know that you accept our invitation to sit at the Guest Table. Kindly mention the subject you would like placed after your name." Later on he wrote to the effect that my choice of a subject was only a blind, and that the toastmaster would tell us what we were to say, so it seems Wise just to take De Cew and Hatch up something because I know the Judge will Sisson having something Moore than a Steage bow.

At any rate, having put such a heavy charge in our digesters, it may be as well to relieve a little gas, although I am not sure whether the liquid should be cooking liquor or a digestive catalyzer. Now it is comparatively safe to sit down at my desk and scribble an editorial that will be read by no one within twenty miles of that sacred spot, but when it comes to standing up here and trying to make a speech, I feel as much out of my class as the Englishman in the first class compartment.

According to Mr. Carruthers, who always tells the truth, even when selling that kind of paper which is said to have the widest circulation, an American entered a first class compartment in an English train, where two Englishmen sat. One of them said in a somewhat disagreeable manner, "I say, my good fellow, you are not allowed to smoke in here."

There was no response, so after a while the objection was repeated a little more vigorously. Still the American smoked.

Finally the Englishman became quite exasperated and said if the cigar were not thrown out the window he would speak to the guard, but at the next station when the guard looked in, the American told him, the Englishman, who was complaining, was riding on a second class ticket. On being asked for it, that gentleman showed his ticket and was promptly transferred to the other coach.

The other Englishman asked the American, as the train started again, how he ascertained that their companionu was riding on a second class ticket. "Oh, that was easy," he replied, "I saw the end of it sticking out of his vest pocket and noticed it was the same color as mine."

Now these two travellers might just as well have continued the journey in peace and each enjoyed his smoke although the Englishman might have chosen a pipe or a cigarette. It seems to me that the pulp and paper makers of Canada and the United States are journeying together. Whether the journey leads to extinction of the forest and death to the industry on both sides of the line, or the perpetuation of timber supplies and continual operation of our mills, depends on the completeness of friendly co-operation between the two branches of the industry. Just as some men smoke cigars while others smoke pipes, and some land grows corn while other soil grows cabbage, so one country is naturally adapted to certain lines of manufacture while another is better fitted to make something else.

Canada and the United States were both blessed by nature with magnificent forests and the earlier industrial development of both countries involved the exploitation of this timber wealth as one of the first of the natural resources to be developed. In fact, in most of the localities it was necessary to remove a considerable part of the forest not only to construct the first log houses of the settler, but to make room for his crops. Increase in population and the consequent increase in the demand for manufactured articles, especially lumber, furniture, implements and ships, called for a continual expansion of industries dependent on the forest for raw material. The centre of the population remained nearest to the Atlantic seaboard until well along in the last century and as most of the shipping was done from Atlantic ports it was quite natural that the forest growth on the hillsides of the Appalachian Range should bear the brunt of the demand for wood. For many years the areas in forest appeared so enormous in proportion to the population that there was little thought or reason for even a crude attempt at conservation.

It was not until about three quarters of the last century had passed that the manufacture of wood pulp became an established industry and even for many years after that time there still remained apparently all the timber that would ever be required. Times have certainly changed and now the pulp and paper industry of America, disregarding for the present the 49th parallel, finds itself with the end of its wood supply almost in sight.

Coincident with the growth of population in the

* These remarks are taken from a talk the editor is supposed to give at the banquet of the Technical Association. They are given here in the interest of "conservation".

United States, the importance of the wood using industries has diminished quite considerably in proportion to the whole industrial development just as agriculture in the eastern States is now almost insignificant in comparison to the total yield from American soil. Along with this change of the character of American industries we find a somewhat parallel alteration in the pulp and paper industry itself. At first, paper mills were purely local concerns using rags collected in the neighborhood. With the improved methods of transportation, many of these scattered mills disappeared and the industry centered in districts which were better adapted than others for the production of paper. New Jersey and Massachusetts, for instance, soon predominated as manufacturers of paper while less and less was obtained from the Southern States. The migration was partly due to the more abundant raw material and water power in the north east.

Just as the rag industry moved northward early in the nineteenth century, so we find now a definite movement of the woodpulp and paper industry to the westward and northward. The north-western States, Canada and Alaska have now the only extensive forest reserves on this continent although careful operation will extend the life of other American forests for some years. These last forest reserves are, in fact, the principal security of the wood working, the publishing, and some other industries of this continent, and to some extent also of other countries. The maintenance of these securities in a productive condition rests with the Canadian people princpally, but there is some obligation on the part of the ultimate consumer as to the reasonableness of his demands on the trustee. Unless there is no likelihood of endangering the life of the investment, or there is great urgency, capital should not be drawn upon for current operation. The demands of the paper consumers on this continent, in the past, have induced the expenditure of our forest capital at an entirely unwarranted rate. We believe the time has now arrived when our Governments realize that a continuation of such a policy cannot be tolerated and that a forest policy is rapidly developing which will limit the amount of timber that may be annually removed from the people's property even though the consumer be obliged to pay a higher price for his product. It is simply a question of relieving the pressure in order to extend the life of the security. There is no question but that the public investment in forest lands will pay the public a handsome and continually increasing dividend. The Canadian regulations regarding the use of Crown land timber are to be looked upon therefor, not in the light of restricting the development of the industry, but rather as ensuring the perpetual operation of the industry both in Canada and the United States.

Friends of the forest in the United States have joined forces in a concerted movement which will prove an important factor in re-establishing the wood using industries of the United States on as sound a basis as they were in the early days. Canada is now industrially in a position not very dis-similar from that of the States in the early days of the woodpulp industry and the growth of the country both industrially and agriculturally will require the removal of considerable quantities of timber. The greatest care in the husbanding of present supplies is therefore imperative. Meanwhile the rapid increase in the value of timber makes it economically possible to transport it almost any distance so that we may see pulpwood transported even from Alaska or Russia to mills in the United States.

We are certain that the present agitation and concern for the future supplies of pulpwood reflects but a temporary condition and that with the establishment of scientific forest policies, many of this generation will see the beginning of the period when the forest will be re-established on non agricultural lands in a perpetually productive condition. It seems to us that there is need for the closest co-operation in the exploitation of the forest reserves of North America because they represent the future security of many industries in both countries. The situation calls for partnership rather than competition. There is no question that there is plenty of room for expansion in both countries and raw material enough to satisfy all the requirements of our populations, and then some.

AN EDUCATIONAL SURVEY.

An important piece of work undertaken by the Joint Committee on Vocational Education was a proper survey of the industry as to the basic educational requirements for the various positions in pulp and paper mills. The committee was fortunate in securing the services of Mr. J. C. Wright of the U. S. Federal Board for Vocational Education. Mr. Wright visited typical mills in Canada and the United States and tabulated the work done by each operator and his probable lines of promotion. With this is a statement of the educational subjects with which each of these should be familiar.

This material appeared serially this spring in the Paper Trade Journal and has been reprinted by that periodical as a handy pamphlet for educators and others interested in vocational education. The report is very comprehensive and will be a great help in the development of educational work. Our contemporary and the committee deserve the thanks of the industry.

Copies may be had in Canada from the Secretary of the Canadian Pulp and Paper Association and in the States from Mr. R. S. Kellogg, 18 East 41st St. or Mr. T. J. Keenan, 542 Fifth Ave., New York.

The man with few words doesn't have to take so many of them back.

The "Autovapor" Thermo-Compression Evaporator

(Description furnished by ESCHER WYSS & CO., Zurich, Switzerland, through their Montreal Office.

Coal consumers everywhere, since the War, have experienced difficulties in procuring fuel, even at high prices, and great efforts have been made to improve the existing heat processes. It is remarkable that one method of heat saving has so far found but little attention, that is the "Bruden" compression process, which allows a practically complete recovery of heat in the exhaust and its renewed utilization. This process can be used with great advantage in all cases where mechanical energy is available for driving the heat engine, and thus opens the field for the economical evaporation of all kinds of fluids, chemicals, acids, dyes, etc.

The apparatus for the Wirth system of thermo-compression is shown in Figure 1: The boiler 1 contains the fluid to be evaporated, which by means of live steam passing through the pipe 2 is first brought to boiling temperature. The vapor generated from the fluid is drawn off through pipe 5 into the compressor 6, and after being compressed, passes through pipe 7 into the heating coil 8 where it condenses. The latent heat of evaporation goes back into the fluid, where it again generates vapor, thus completing the cycle. The compressor acts thus as a booster, by means of which the temperature of the vapor coming from the fluid is brought to a higher level so that it can be used again for boiling and evaporating the fluid. In this way the heat in the vapor is entirely recovered and made use of; the process requires no supply of new heat except for small losses through radiation, but only mechanical energy to drive the compressor. In most cases the compressor is sufficient to take care of the losses besides keeping the cycle going. The heat equivalent of the energy supplied to the compressor is only a small fraction (about 9%) of the total heat utilized, which fact makes this process especially suitable for installation where mechanical energy (electric or steam) is used.

It is evident that in a process, the feature of which is the saving of every percent of coal, the heat of liquid must be utilized as much as possible. For this purpose there is shown in Fig. 1, an exhaust feed heater (10) in which the hot condensate coming from the coil 8 gives its heat to the cold fluid entering through the coil 12. The results obtainable in the "Autovapor" are shown graphically in Fig. 2. The figures given are test results with an apparatus of about 2,200 lbs. per hour capacity.

The "Bruden" compression is an old process, but only recently has been developed for economic use on a large scale, and although the principle is very simple in itself, it presents great difficulties in practice. It would be a wrong conclusion to assume that the combination of any evaporator with a compressor is suffi-

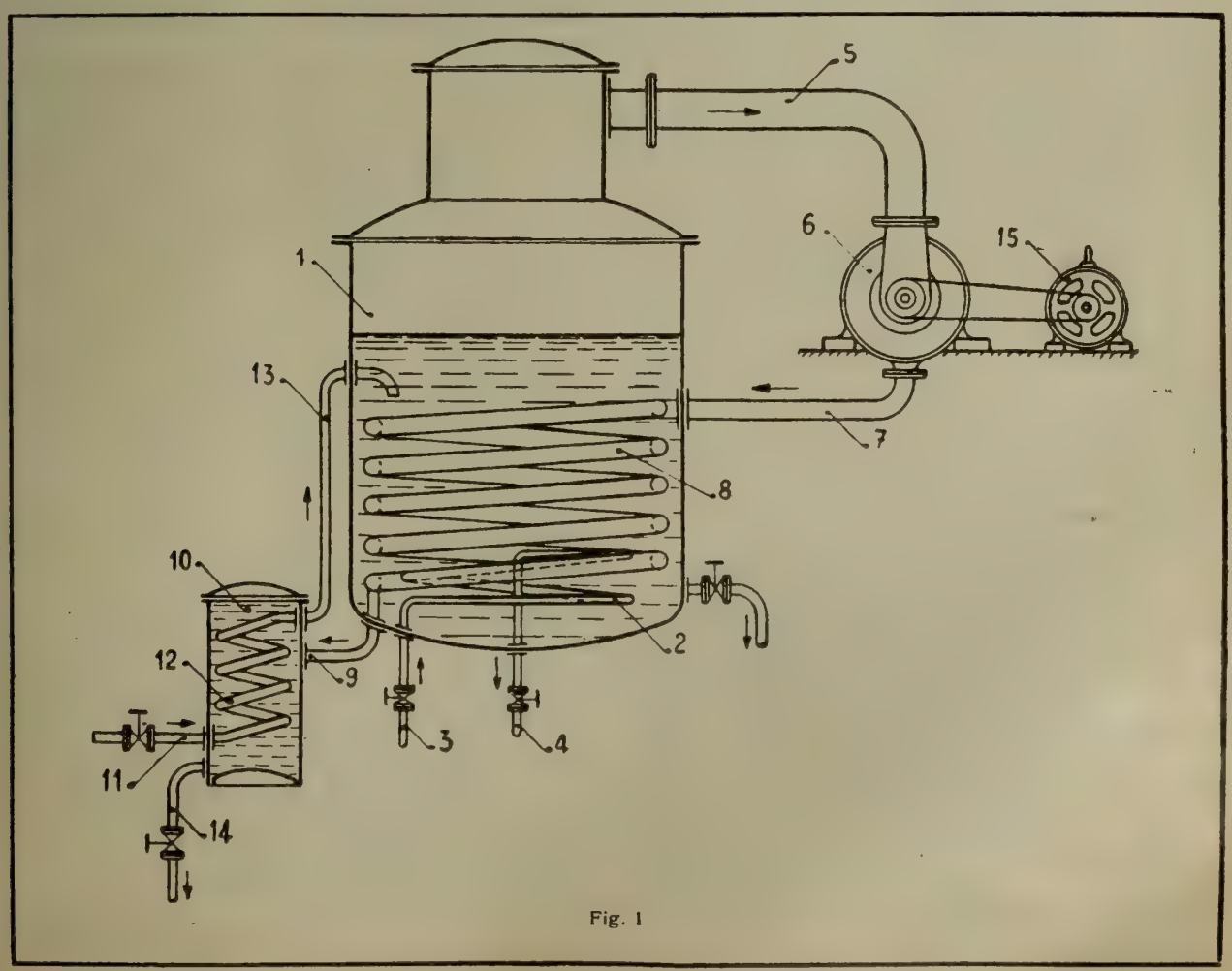


Fig. 1

cient to obtain a satisfactory operating installation; unless all details are considered and calculated correctly, the combination fails utterly.

Although evaporating plants are now in use in a number of industries, only very few of the installations show that the designers had a real understanding of the rather complicated boiling and condensing processes. The generally used multiple-effect evaporators do not reach the economy of the "Bruden" process.

It is of importance to note that the efficiency of the compressor affects only the comparatively small input of energy, and not the comparatively large heat of steam. For instance, if the compressor has an efficiency of say 70% it would be erroneous to say that 30% of the compressed vapor is lost and has to be made up in live steam heat. The compressor causes only a very small heat loss through the stuffing boxes and through radiation.

The "Bruden" principle can be used for most evaporating plants operating under the pressure or in vacuo. As the specific volume of the vapor increases with the lower pressure, the operation in vacuo necessitates larger compressors; it is more economical to operate, if possible, under atmospheric pressure, unless chemical conditions of the fluid require lower boiling temperatures. In plants using multiple apparatus operation in vacuo is adopted to utilize the drop in temperature; this is not necessary for the "Bruden" process. In all cases however, where the characteristics of the fluid change at high temperatures, a maximum temperature must not be exceeded. This process has the advantage then, that the evaporation is actually going on at the temperature desired.

The "Bruden" process has been used principally for caustic soda, dye solutions, cellulose, lye, etc., and in addition to these, the production of salt (chloride of sodium), the evaporation of milk and malt products, the distillation of water and chemicals, will offer a great field for the "Autovapor".

The operation and attendance of the plant is most simple. The "Autovapor" is fitted with automatic feeders and safety contacts so that the compressor stops in case of faulty operation or negligence. The sudden inrush of scum and fluid, which sometimes happens with surface or jet condensers, is impossible, as special devices are fitted on the boiler to prevent formation of scum. The economy of the process can be seen from the test made by Prof. Dr. Stodola of the Zurich University, the result of which was given as follows:

"In the Plant tested, we generated with 1 K. W. Hr. 36.0 to 37.7 lbs. of steam per hour, from a solution of caustic soda of 7° Beaumé and concentrated same during test to about 23° Beaumé. Calculated in heat units, this means that by means of the process used, 11.2 to 11.7 times the amount of heat has been utilized for the evaporation, which would have been available by direct conversion of the electric energy into heat. This result must be considered the more favorable as it was obtained with a plant of only about 50 K.W. capacity and unfinished insulation on boiler and compressor. The temperature of the condensate was 80°C. while the entering solution had a temperature of only 20°C. By installing a pre-heater of larger heating surface, the greatest part of the heat lost on this difference could be recovered.

The purity of the condensate is confirmed through the analysis of the Zurich Chemical Laboratory; according to the report of Jan. 15th 1918, the condensate contained 0.002 grains per liter of caustic soda (NaOH). Samples taken on the compressor and boiler show also only negligible quantities of soda.

Zurich, 18th February, 1918.

(Sgd.) PROF. DR. STODOLA.

This installation was started up with live steam, small radiation losses were also covered through additional live steam. The measured electric input cover-

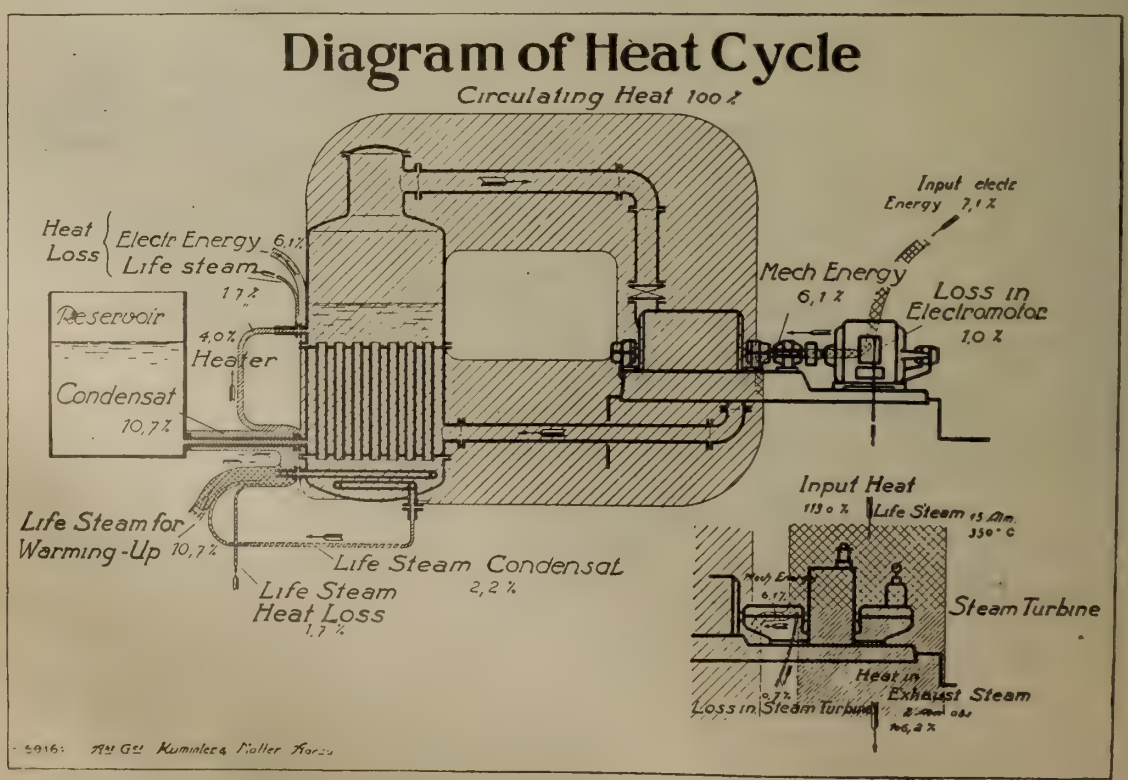


Fig. 2

ed all energy used and included the losses of the electric motors, power required by the auxiliary apparatus, etc., also the insulation, thermal and radiation losses.

The test report shows the following results obtained:

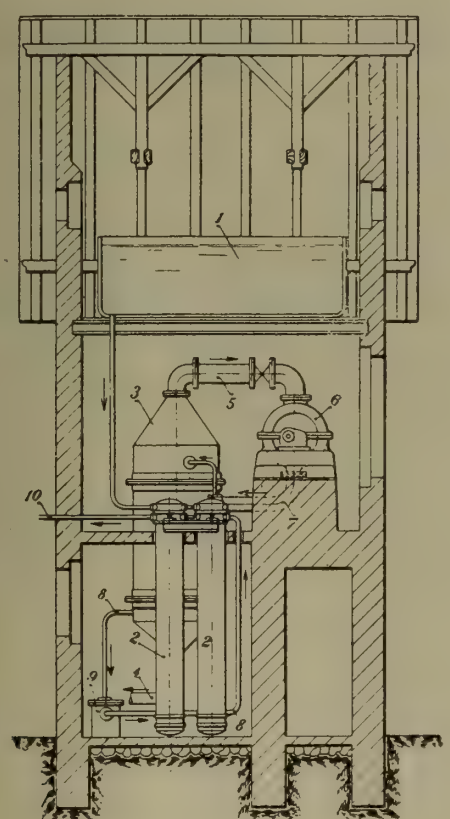
Average output of 5 hours; 2,170 lbs. of water with 52.97 K.W.Hr. or 40.92 lbs. per K.W. Hour.

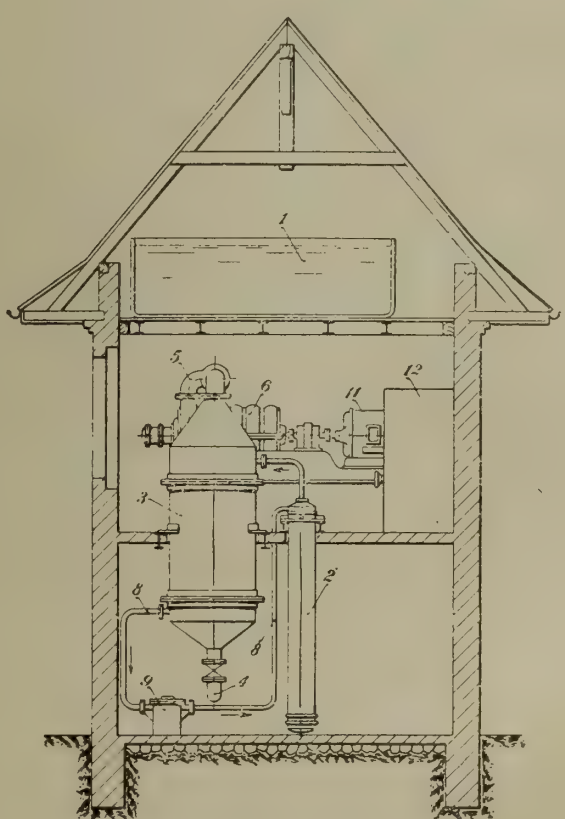
Average output of best hour: 2,588.5 lbs. of water with 55.51 K.W.Hr. or 46.42 lbs. per K.W.Hour.

In general the following figures can be assumed for evaporation of various fluids:

	Lbs. per K.W Hr.
Distillation of ordinary water	61.5 — 92
Evaporation of fluids of low boiling temperature, specific weights below 1.2	44 — 77
Evaporation of common solutions of caustic soda. Specific weight not over 1.2	35 — 57
Evaporation of common solutions of caustic soda. Specific weight not over 1.5	15.5 — 44
Electrolytic solutions of caustic soda concentrated to 1.3 specific weight.	31 — 40
Electrolytic solutions of caustic soda concentrated to 1.5 specific weight.	11 — 15.5
Sulphite solutions of about 1.3 specific weight	35 — 75
Dye solutions	35 — 75
Milk, malt and sugar solutions.	34 — 66
Distillation of sea water and salt solutions	38 — 66

The lower values are for small outputs up to about 2,200 lbs. per hour, and unfavorable conditions, the higher figures for outputs of about 9,000 lbs. per hour and more favorable conditions.





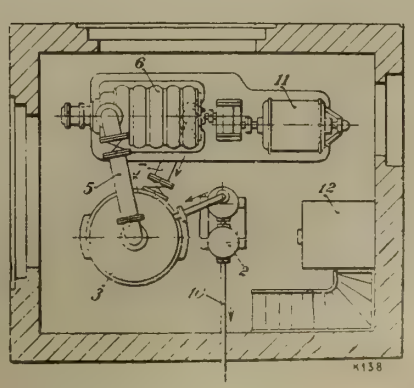


Fig. 3 shows an "Autovapor" Plant as installed by Escher Wyss & Co., together with Kummler & Matter. The solution from the reservoir (1) goes through the pre-heater (2) into the boiler (3) where it evaporates. The concentrated solution is led away through the discharge pipe (4). The vapor is drawn through pipe (5) into the compressor (6), and leaves same after compression through pipe (7) to re-enter the boiler as heating medium. (8) is an overflow pipe for condensed water from the boiler to the pre-heater (2). The electric motor (11) and switchboard (12) complete the installation.

Fig. 3

The apparatus can be built for continuous or intermittent operation. In some cases it is advantageous to effect only the pre-evaporation by means of compression, while the final concentration is done by direct boiling or exhaust steam. Prof. Stodola's report shows that the condensate coming from the "Autovapor" is pure. This is important as such plants can serve two purposes at the same time: the concentration of a solution, and the production of distilled water. The test made on the condensate showed that the water was absolutely sterile.

The economy of the "Autovapor" compared with a process using coal is shown in the following two calculations for the two principal applications:

A. ELECTRIC ENERGY vs. COAL.

Coal or Steam.

1. Simplest, most unfavorable case with simple evaporation and small boiler:

Evaporation in the apparatus:—6 lbs. per 1 lb. Coal.

2. Best results obtained with triple effect evaporator, large steam boiler and utilization of high pressure live steam prior to use in a steam engine.

Evaporation in the apparatus:—16—21 lbs. per 1 lb. Coal.

Power obtained:—0,136—0.18 KW Hr. per 1 lb. Coal.

1 lb of Coal therefore produces:—6—21 lbs evaporation, plus 0.18 K.W. Hr. Power.

ELECTRIC EVAPORATION.

1. K. W. Hour will give an evaporation of 31—92 lbs. therefore

1. K. W. Hour is equivalent to 0.66 to 11.0 lbs of Coal, or, on the average;

1. K. W. Hour is equivalent to 2.2—6.6 lbs. of Coal.

From this it can immediately be calculated at which current prices the electric evaporation is equal or superior to coal. With an average cost of 3c per K.W. Hour and average cost of coal to be of $10.00 per ton, the cost is about equal. Where cheap electric power is available or coal is higher, the electric evaporation is more favorable.

B. EVAPORATION WITH "BRUDEN" COMPRESSION.

According to "A" 1 lb. of coal produces besides 35—46 lbs. of evaporation, about 0.18 K.W.Hr. in power in a multiple evaporator. When using the same energy for driving an "Autovapor" "Bruden" Compressor and assuming the most favorable pre-evaporation, this energy can evaporate an additional 44—77 lbs. per K.W.Hr. or 17.6—31 lbs. per 1 lb. of coal.

The total evaporation can thus be increased to 24—28 lbs. per 1 lb. of coal, or by 50—65%. The ratio will be still better when using high grade boilers at high pressure.

The "Bruden" process allows therefore a considerable saving compared with the multiple apparatus and has the further advantage that the boiling temperature of the fluid can be chosen as desired. The Stodola test was made with a relatively small apparatus and the efficiency of the compressor is considerably higher for larger outputs. While the evaporation with 2,200 lbs. is 19.3 K.W.Hr. this is increased with 44,000 lbs. to 26.8 K.W.Hr. or by 39%. With fluids similar to water evaporations up to 84 lbs. per K.W.Hr. can easily be obtained.



Fig. 4 shows the rotary "Zoelly" Turbocompressor as manufactured by Escher Wyss & Co., suitable for drive by electric motor or steam turbine.

DIFFERENCE BETWEEN MOLDS AND WOOD DESTROYERS.

Not all fungi which live upon wood impair its strength, but conditions which promote the growth of molds, blue-stain fungus, and other non-injurious fungi are usually favorable to the growth of the wood destroyers, and these may be active on the same wood bearing the molds. Hence, the presence of mold on timbers intended for any structural purpose should cause them to be looked on with suspicion.

In the early stages of their growth the molds and wood-destroying fungi sometimes have a very similar appearance, and there is no simple means known to the U.S. Forest Product Laboratory by which lumbermen and wood users can separate them at sight. The surface growth of molds is generally cottony or felty in appearance; the mycelium or fine mold threads are interwoven, never compacted into membranous sheets or strands. The mycelium of wood destroyers may be fluffy and glistening, but more usually are compacted into strands or fan-shaped patches.

The characteristic feature of mold growth on wood is the fact that the minute threads which enter the wood do not bore into the wood fibers or dissolve them away. They pass through the spaces between the fibers or enter them through the natural openings, called pits, which are found in the walls of certain cells. Starches, sugars, and other contents of wood cells constitute the food of the molds.

The wood destroying fungi are able to send their threads right through the wood fibers, breaking down the cell walls and utilizing portions of this decomposed material as food. This action very markedly weakens the wood, making it crumbly, stringy, or spongy,—in other words, producing rot or decay. The presence of wood-destroying fungi in an advanced stage of growth is evidenced by fruiting bodies, commonly called mushrooms, toadstools, conchs, or brackets.

The principal economic loss caused by molds is through the staining or discoloration of the wood. No greater injury may be caused by the wood destroyers in their early stages; but their work will continue and finally result in the destruction of the wood if favorable moisture and temperature conditions prevail.

Transactions of the Technical Section

INVESTIGATION INTO SPECIAL BRONZES.

By F. GIOLITTI and M. MARANTONIO.

Translation from "Gazetta Chemica Italiana", 1910, Vol. 50, Part I, pp. 51-77.

Prepared for the Committee on Mechanical Standards of the Technical Section of the Canadian Pulp and Paper Association.

I. Lead-Bronzes.

In addition to the white alloys known by the name of "anti-friction", use is often made of various types of special bronzes in the construction of machine parts subject to wear, and particularly for bearings. And of these special bronzes the best results seem to have been given heretofore by the lead bronzes containing about 10 p.c. tin and up to 20 p.c. lead. As examples of the composition of lead bronzes that have given good practical results in the construction of bearings, we quote a few of the alloys examined by Dudley (1):

	I	II	III	IV
Copper	79.70	82.20	77	77
Tin	10.00	10.00	10.50	8
Lead	9.60	7.00	12.50	15
Phosphorus .	0.80	..	..	..
Arsenic	..	0.80	..	..

Of these bronzes, used for bearings, for railway car axles, the last two (plain lead bronzes) behaved best, undergoing the least wear.

For bearings intended to support a shaft at great speed but not under a very high load, a bronze containing 84 p.c. copper, 8 p.c. tin, 8 p.c. lead seems to lend itself very well.

We could cite very numerous other examples from which—it would obviously follow that a study of the ternary system, copper-tin-lead, made with a view to explaining the structure and properties of the lead bronzes used as metals for bearings (the only practical use for which such alloys have heretofore been employed), may be confined to alloys containing less than 20 p.c. lead and less than 25 p.c. tin: the alloys containing higher percentages of these two metals do not lend themselves altogether for the manufacture of bearings.

For this reason we confined our investigations to lead bronzes containing less than 25 p.c. of tin and of lead respectively. Nor, on the other hand, would the complete and accurate investigation of the ternary system copper-tin-lead have been possible with the means at our disposal, in view of the unusual complications necessarily encountered by the complete equilibrium diagram of a ternary system like the one dealt with, in which two of the constituents—copper and tin—form one of the binary systems for which the equilibrium diagram is more complicated[2]. A complete and accurate study of the ternary system would have required the use of most delicate instruments, which were not at our disposal.

The data available heretofore on the constitution of lead bronzes were not numerous. Charpy, in his interesting work on the anti-friction alloys (Investigation into the white alloys called anti-friction: Contribution to the study of alloys pp. 203-240), even speaks of the lead bronzes, quoting several of the alloys analyzed by Dudley. He says, that the introduction of lead into bronze—with which it forms an alloy only in small proportion—only increases its plasticity. He notes the segregation and liquefaction phenomena which take place in the solidification of the lead-bronzes containing above 15 p.c. lead: and he remarks that the constitution (composition) of the bearing bronzes is the reverse of that of the white alloys, as in bronzes, instead of hard grains included in a plastic eutectic alloy, we find plastic copper crystallites (in reality these α crystals are formed from the first solid solution) enclosed in hard eutectic[3]. Other data on the composition of lead bronzes are not given in Charpy's work: nor are the few that have been quoted accurate (as we shall see further on) as the accurate knowledge of the binary copper tin system is of more recent data than Charpy's work.

A few more detailed data on the lead-bronzes—but referring, above all, to their mechanical properties—are given by Guillet in his volume "Industrial Study of Metallic Alloys". The author—after having quoted Charpy's observations, already cited—examines the mechanical properties, stress, the limit of elasticity, elongation, contraction of area, resistance to shock, and hardness of a number of lead bronzes obtained by starting from an ordinary bronze containing 90 p.c. copper and 10 p.c. tin (plus traces of zinc) and substituting gradually lead for the copper so as to vary the content of the latter metal from .51 p.c. to 6.18 p.c. From his experiments, he deduces: 1st. That a quantity of lead below 3 p.c. produces but a slight decrease in the tensile strength, in the elastic limit and in hardness, and does not bring about any change in the elongation, contraction area and brittleness.—2nd. That when the percentage of lead exceeds 3 p.c. the resistance to tensile stress and the limit of elasticity decrease rapidly until they reach the values of 14 and 8 kilograms per square millimeter, respectively; at the same time there is a decrease in the elongation, contraction area and hardness, and the brittleness becomes considerably pronounced. — 3rd. All the alloys containing more than 7 p.c. lead always show the same mechanical properties, which the author explains by liquation taking place in the act of solidification of the alloy, which liquation causes the ingots of the various bronzes to remain constant in the composition of the central parts from which are taken the samples for mechanical tests.

We shall revert later on these observations of Guillet's.

Guillet makes a few other remarks on lead bronzes in his investigations into special bronzes published at various times in the Revue de Métallurgie. In some investigations the author points out the possibility of doing for the special bronzes what he himself has already tried to do for special brasses, viz., to determine for each metal a numerical coefficient according to which the metal itself could be substituted for the tin of the bronze without changing the mechanical properties thereof. But even from this series of investigations, very little can be gathered on the composition of lead bronzes.

Finally E. S. Shepherd and E. Blough[4], wishing to apply Bancroft's method to the study of the com-

position of the binary alloys of copper and tin, selected lead as a third metal and prepared a series of lead bronzes; but these bronzes were only examined from the special viewpoint of these, so that even from the experimental material collected by them, very little can be gathered on the conditions of equilibrium of the ternary system copper-tin-lead.

Having thus briefly explained the reasons for which it seems fitting to undertake the systematic study of the ternary alloys of copper, tin and lead—at least for the field within which are included those of these ternary alloys most frequently used in industry—we shall set forth without further remarks the methods of investigation adopted by us and the results obtained.

As materials for the preparation of the alloys we took copper, lead and tin of a practically absolute purity, furnished by the firm Kahlbaum. We always took such a quantity of the three meals so as to obtain for each melt a constant weight of 300 grs.. We placed first the copper and the tin—weighed—in a tall graphite crucible and heated it in a Perrot furnace until complete fusion of both metals, keeping them always under a layer of coarsely puverized charcoal so as to protect them from any oxidizing effect of the furnace gas. To the two metals melted we added the lead, stopping then the gas flow that fed the furnace and we stirred vigorously the molten metallic mass, using the same porcelain tube (varnished and closed at the end immersed in the metallic bath) which we used afterwards as guard for the thermolectric tongs. All the openings of the furnace being closed so at to prevent cold air currents, we introduced into the above mentioned porcelain tube immersed in the molten mass with its sealed end, the junction of a platinum-platinum rhodium thermocouple, connected at the two free ends with a Siemens galvanometer on which we could read during the cooling the successive temperatures to an approximation of 2 deg. C.

When this was done, we stated in the following tables — in the usual manner — the results obtained from the study of some of the series of alloys whose composition — indicated in the tables themselves — we always checked by means of the complete analysis of two samples taken, at various points in the cooled metallic ingot. We shall refer further on the differences which we deduced in various cases from the results of the analyses made on two different samples of the same alloy.

The microscopical examinations reported later, were made with a Le Chatelier microscope: after polishing the metal surfaces first with various emery papers and finally with chromium oxide and etching them with reagents that will be indicated in each case.

Since (for reasons already mentioned) we confined our investigations to alloys containing less than 20 to 25 p.c. of tin and of lead — and this within the region in which tin always appears in the state of a copper compound (Cu_4SnCu_3Sn and their solid solutions) — it was not of great importance for us to know accurately the properties of the binary alloys of lead and tin, whereas it was an essential condition for the right interpretation of the equilibrium phenomena in the ternary system with which we intended to deal to know as accurately as possible the behaviour of the other two binary systems: tin-copper and lead-copper.

With regard to the former, tin-copper, one of us has recently completed and published, conjointly with Dr. Tavanti[6] a series of exact investigations on which we can base the present studies.

As to the behavior of the second binary system — copper and lead — although it is already known in its essential features, we deemed it necessary to subject it to a more accurate investigation, above all in order to determine with greater accuracy the position of the critical points in the diagram representing it[7]. For the determination pertaining to this part of our work, Dr. O. Ceccarelli was a valuable collaborator. In order to determine the position of the critical points in the equilibrium diagram of the binary system copper-lead, it will be sufficient to determine the cooling curves of six alloys of different compositions.

The results of these determinations are contained in the following table and graphically represented in the combined diagram. (Fig. 1.)

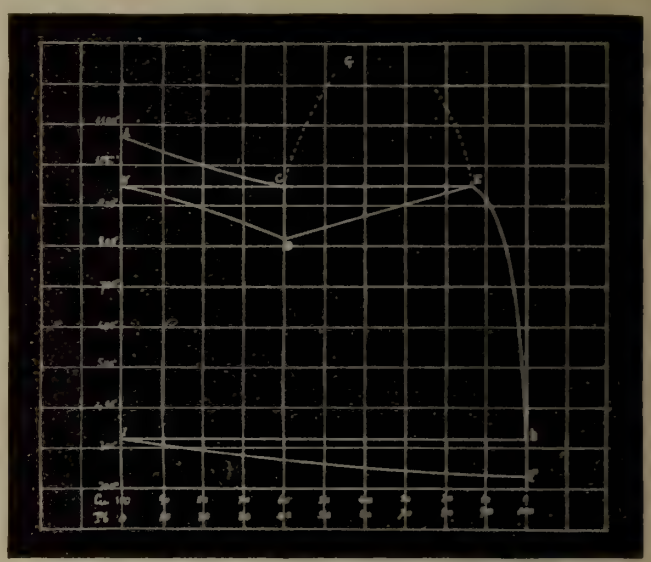


Table I

No. of sample	Percentage Composition		I (beginning)	II (end)		III (end)	
	Cu	Pb	Temperature °C	temp. °C	duration mn.	temp. °C	duration in mn.
1	90	10	1038°	949°	2,25	323°	1,5
2	80	20	1000°	948°	5	323°	3
3	60	40	----	949°	13	323°	4
4	40	60	----	949°	9	323°	7
5	20	80	----	947°	1,8	323°	8
6	10	90	919°	---	---	323°	9

From the course of the curves in the diagram — and especially (H D E and I F) which represent the duration of the isothermal transformations — it follows clearly that the two metals do not form any definite compound by themselves and are only imperfectly miscible in the liquid state: they are not at all miscible in the solid state. The mutual solubility curve in the liquid state (a curve whose entire course as will be noted cannot be traced on the basis of the thermal determinations and which for this reason is indicated by a dotted line CGE) intersects the crystallization curve of copper in the two points C (60 p.c. Cu) and E (13 p.c. Cu) at the temperature of 950 deg. C. As will be seen, the values of the coordinates of these points, which follow from our determinations, differ from those determined by previous experimenters. Under the experimental conditions under which we worked we obtained results

nearer to reality. It is seen that the eutectic point copper-lead coincides practically with the fusion point of lead.

As to the microstructure of the copper and lead alloys, it does not show anything noteworthy. In these alloys the two metals are always found side by side in a pure state, and only the dimensions of their particles and the greater or smaller homogeneity in the distribution of the two metals through the molten mass vary with the composition of the alloy and with the rate of cooling (solidifying) of the mass. The copper — as the ligter one of the two metals — tends naturally to travel towards the upper regions of the molten mass: and this phenomenon takes place to a greater extent in proportion as the solidification rate of the alloy decreases. All other conditions being the same, this is much more pronounced for alloys whose composition varies between 60 and 12 p.c. copper; that is to say for those which are already divided in the liquid state into two distinct solutions, whose composition varies with the decrease of the temperature along the two descending branches of curve CGE. In these alloys the distinct separation of the solidified mass into the superposed layers of quite different average composition is very evident. This latter fact is very obvious and has a noteworthy practical importance, as can be easily understood.

We need not say anything further now on the properties of the binary alloys of copper and lead. What has been said is sufficient for the study of the ternary alloys, with which we are concerned.

(To be Continued.)

THE MICROSCOPE IN THE MILL.

A further contribution to the discussion of the paper read at the annual meeting is contained in the following letter from a member of Forest Products Laboratories.

The microscope has proved of such great value in the hands of many of the most advanced pulp and paper technologists that every one whose business is to control processes in pulp and paper manufacture knows that this instrument is, or might be, a most important part of his equipment.

Many of those who had not hitherto employed the instrument in their laboratories attended the meeting of the Technical Section of the Canadian Pulp and Paper Association on January 19th in the hope of learning something about the microscope and its application to the problems, which it is their business to solve. The paper which was announced for that meeting was entitled "The Microscope and its relation to the Pulp and Paper Mill", and was duly read by its author. For about one and one-half hours the audience sat quietly while the paper was read and expounded, and the exponent was given all the time which he required. Advance proofs of this paper were also furnished to the audience through the generosity of the proprietors of your Magazine. The paper was subsequently published in your issue of the 31st March.

It is usually easy to criticise an author, especially when he tries to give a fairly complete account of a rather complex instrument at a single sitting, but in the present instance criticism is so easy that one's sporting instincts rebel against the task. There is, however, another aspect of the matter which cannot be overlooked. Several members of the audience were asked what they thought of the paper and they replied that it was too technical for their comprehension. It seems, therefore, that the paper may have done a positive disservice to the cause of the microscope and on such grounds it becomes one's duty to make some comments upon it.

The important question is: Does this paper convey any real information about the microscope or its application to the problems of the pulp and paper mill?

One may answer this question with a plain negative, for although there are occasionally sentences which are correct statements of fact yet placed as they are they may convey nothing to the person who is not already aware of the facts. Most of the sentences are either misleading or incorrect. Many examples might be given but a few will suffice to justify such severe criticism.

"Thus every objective falls somewhere between the 16 m.m. objective and the 1.9 m.m. oil immersion type". This is simply untrue. We use objectives which have four or five times the focal length of the 16 m.m. objective and objectives of shorter focal length than 1.9 mm. are listed in several makers' catalogues.

"The Abbe Condensers of the aplanatic type" described by the author are not Abbe condensers at all but originated long after Abbe's death.

"The correction for this (chromatic aberration) is the exclusion of the marginal rays". This sentence is incorrect. "Chromatic objectives are those in which the color distortions are corrected". There are no such things as chromatic objectives on the market today. They were objectives in which the chromatic aberrations were not corrected. The author means achromatic objectives.

When one reads the paper for some practical guidance, the choice of an illuminant or a method of mounting objects, for instance, one finds the author wandering off into vague generalities on the one hand and a recipe for cleaning glasses on the other. His main contribution to the subject of Manipulation concerns the removal of cedar oil from the objective and balsam from the stage. The author has also a paragraph on adjusting a mechanical stage which in his case was evidently a badly constructed one. His recommendations concerning rendering more visible the lines on a stage micrometer would not apply to any of our micrometers and we have three by different makers.

Let no one think, because the subject of microscopy as set forth in the paper referred to is beyond their comprehension, that therefore the use of the microscope requires some special qualifications. The instrument as applicable to the work of a pulp or paper mill is very little more complex than a telescope.

The utility of the microscope and the simplicity of its management are matters which are readily demonstrated and persons interested in such a demonstration may be accommodated at any time at the Forest Products Laboratories of Canada whose staff exists to assist the wood-using industries in all matters of technology.

Yours truly,

WILLIAM B. STOKES.

The Balbirnie Paper Mills have been purchased by the Fife Paper Mills, Ltd., of Leven, Fife.

Prices of woodpulp remain unchanged. Business is at a standstill.

The hand-made paper industry in England still continues busy and with plenty of orders on their books.

Canada Not Hostile to United States in Matter of Pulpwood

By A. R. R. JONES.

There is no hostility among Canadian pulp and paper interests to similar interests in the United States over the question of pulpwood. This fact does not always seem sufficiently appreciated in certain quarters on the other side of the line where there is some complaint just now, among pulp and paper concerns, of Canadian restrictions on the export of pulpwood, and apparently some idea that these restrictions are growing in stringency. A survey of the facts, however, affords no ground for any such dissatisfaction.

It can, of course, be readily understood that, in the circumstances in which the United States' mills find themselves today, the question of the scarcity of pulpwood should greatly exercise the minds of those who operate them. For it is generally recognized that the pulpwood resources in the United States have now reached such a state of comparative depletion that it is very difficult for these mills to obtain the supplies they require within accessible regions. A few mills, it is true, like those of the Great Northern Company, of Maine—and there are other companies in Maine of which the same thing can be said—own their own woods from which they derive the supplies they need. There are a few, too, in New Hampshire which are in a similar position. And certain classes of paper, chiefly fine papers, are made in the South from wood grown there. But whereas in the State of Maine only about ten per cent of the pulpwood which is used by the pulp and paper mills is imported, the State of New York, for example, is very largely dependent on supplies from Canada. However, comparatively favorably situated as Maine is in the matter, it is estimated that there are even in that State only about 28,000,000 cords of wood which, under normal circumstances, will last for only about twenty-five years.

Thus the question of pulpwood supply is one of very great and grave importance to the pulp and paper industry in the United States. That is understandable enough. But it affords no grounds for complaint of Canadian restrictions on the export of pulpwood or for the contention that those restrictions are increasing in stringency. As a matter of fact, during last year, which was the maximum year of production in the United States, all the wood the mills of that country wanted they got from Canada. As regards the alleged increase in restriction, this is a fallacy, so far, at any rate, as the Province of Quebec is concerned. For the same regulation is in force today in this Province which came into force in April, 1910, and which provided that all timber cut on Crown lands in the Province must be manufactured in Canada. This regulation has been in force for ten years, but it is now being criticised on the other side of the line, because, owing to the scarcity of pulpwood in their own country, certain owners in the United States of timber licenses in Canada want the manufacturing condition abrogated so that they can export pulpwood to the United States, to be manufactured there.

The United States has been prodigal of its pulpwood resources, partly, perhaps, through a misunderstanding of their extent, and partly through neglect of a proper system of reforestation. It must be borne in mind, however, that a very considerable portion of the standing timber in Quebec—and the same thing is true of other Provinces—is not on Crown lands. United States pulp and paper concerns can buy wood from Canadian farmers, for example, on the same terms as similar concerns in this country. Indeed, Canadian mills throughout and since the war have themselves had to purchase large quantities from farmers, particularly when labor conditions have been unfavorable. Thus mills in the United States are able to get a large part of their requirements in unmanufactured form. As regards wood on Crown lands, they are subject to the same regulation as Canadian mills, that is to say they can cut the wood and convert it into pulp and paper, so long as the process of manufacture takes place in Canada. The objects of the export regulations in Quebec and other Provinces are, first, to prevent the wood supply from being decimated, and, secondly, to conserve our own industries in each Province. Certain American pulp and paper concerns, as is well known, have put up mills in Canada—and profoundly welcome they have been.

No political question is involved in the matter, and all rash talk which serves to create or to foster anything like mutual antagonism relative to it, is to be deprecated. The pulp and paper mills on this continent, on whichever side of the line, are all associated together in the furtherance and development of a great industry.

At the same time, it is essential to Canada's future in the pulp and paper industry both that she should prevent her forests from being "shot to pieces," so to speak, and also that she should pay closer attention to the important matter of reforestation. It is easily demonstrable that an adequate supply of pulpwood is the supreme and governing factor in the pulp and paper industry on this continent. Each year the cut of pulpwood will go farther back from the sides of the lakes and streams. Each year it will go farther north. Each year it will recede into less and less accessible regions. It is a difficult matter to get anything like an approximate estimate of this country's pulpwood resources. But surveys have been made which show that there are about 670,000,000 cords of spruce and balsam fir in Canada. The supply in this country, in the opinion of Mr. R. S. Kellogg, secretary of the News Print Service Bureau in the United States, will last, taking present consumption into consideration, for about fifty-six years.

According to Mr. Kellog, the best the pulp and paper industry in the United States can hope for "is a pretty severe stringency during the period between the complete exhaustion of the present supply of pulpwood and the coming on of the new supply brought about by general forest protection and reforestation through the cooperation of national, State and private agencies. On account of the tremendous investments required in the development of pulp and paper plants, manufacturers must, of necessity, figure on an operation of forty years or more, in order to bring their overhead charges down to a reasonable factor in production cost. This is the reason why the industry must take a long look ahead in providing for its raw material."

These words, though used with respect to the industry in the United States, convey a grave warning to Canada, which she may well lay to heart—while yet there is time.

British Trade News

(From Our London Correspondent.)

London, March 29, 1921.

The Utrecht Fair, which enables manufacturers to reach the Dutch market and the Dutch Colonies, with their population of 40,000,000 people, will be held this year from the 6th to the 16th September. The Fair is one of the best established buying centres in Europe and is an extremely important one. Woodpulp manufacturers, or makers of machinery for pulp and paper manufacture, will find the Fair useful for exhibiting Canada's products.

Newspapers Reduce Price.

Owing to the drop in the price of newsprint recently some of the newspapers in England are going back to their original price of 2 cents a copy. They are mostly the old established newspapers. There are two bright elements in newspaper production today, one being a slight reduction in newsprint costs and the other a reduction in wages where bonuses were paid on the rise and fall in the cost of living. The tendency, however, is for newspapers to get into the hands of combines owing to the high cost of production and the labor element is condemning this policy.

A Fortune From Wall-paper.

The late Mr. John Potter, of London, one of the founders of Wall Paper Manufacturers, Ltd., who have an extensive mill at Darwen, in Lancashire, and who died sometime ago in his 66th year left unsettled property valued at £254,136 gross, of which the net personality has been sworn at £200,119. In his will he did not overlook his employees as he has left 5,000 £1 shares in the Darwen mill, for their benefit and their families, according to a scheme drawn up by his Trustee. Mr. Potter was greatly interested in the welfare of his workers and the results of his labors on their behalf stand at Darwen today as a monument to his memory.

Bentley & Jackson's Loss.

Death has removed a valued servant from the employment of Bentley & Jackson, the well-known papermakers' engineers, in the person of Walter Partington. For thirty years he was connected with the engineering firm, two decades of which he acted as secretary. Mr. Partington was only 52 years of age and he came of an old family of papermakers. He leaves one brother in Canada, in the papermaking industry, and one in the States to mourn his loss. Firms, of course, can ill afford to lose old servants like this as they always prove a valuable asset when conferences on policy and unusual departures in business routine are under consideration.

Electricity in Mills.

The introduction of electricity into British paper mills is not so progressive as one would imagine. Only 21 concerns out of 500 papermaking concerns in the United Kingdom utilize it. They are consequently behind Canada as regards electrification. The British papermaker, however, is a very staid old gentleman, as is instanced by the delay in establishing a Technical Section for the industry, and he is very careful about adopting new methods in case the report trade might get upset in his mill. And he cannot be blamed. He is in a competitive market with foreigners underselling him and a government disinterested in his welfare and industry. It consequently behooves him to be cautious in regard to alterations in his mill.

Another Newspaper Ceases.

The northern edition of the London "Daily News," which for the past 12 years has been printed in Manchester, has been dropped owing to the cost of paper and the high cost of production, and will in future be published from the office in London. This northern edition was really a duplicate of the London paper and was admirably produced. Indeed, I have happy recollections of being a paragraphist for it when it first started. Apart from the loss this paper means to paper manufacturers in the way of newsprint, the change means a big staff joining the ranks of the unemployed.

"In The Game."

The eyes of printers and papermakers in England have been opened considerably by the progressive policy of The Industrial and Educational Publishing Company in their endeavor to secure a supply of paper by establishing their own mill. No firms in the United Kingdom producing trade journals have ever attempted such a scheme and in the daily Press only the Northcliffe papers and the "Daily Telegraph," owned by Lord Burnham, get their paper direct from their own mills. The action of The Industrial and Educational Publishing Company is a great step in the history of printing and one that all Canadians may take their hats off to. Canada is certainly giving a great lead to some of England's great and wealthy trade journals, and I doubt if any Germans or French firms have ever attempted such a progressive policy. The name of The Industrial and Educational Publishing Company will be honoured in the printing world and there will be no doubt as regards achievement in paper manufacture.

The Depression.

As I write the Easter holidays are on and they are welcomed as a respite in the depressed state of business in the paper industry. Travellers return home with the same old story, "Nothing Doing." It is a most anxious time for them and the mill also. One said the other day that throughout all his journeys he only received one order and that was from the mill to return home. It is typical of the times. The holidays are consequently welcomed and some mills have taken advantage of them by introducing 3 days work a week, or closing down for a week. This is certainly not a healthy sign, but the movement is in common with the textile and other industries.

Chemicals.

From a paper manufacturer's point of view the chemical market has turned in his favor, but little business is passing. Caustic soda can be had from £26 to £27 for 76 p.c., and from £24 to £25 ss. per ton for 70 p.c., and Bleaching Powder can be shipped abroad in casks at £23 to £24 per ton. Sulphite of Alumina is £13 5s. to £16 a ton, and the export trade in Alumina stands at £19 to £20 a ton. Sulphur is quoted as follows: Home Flowers, £25 a ton; Roll £17; and Rock, £11 a ton. Sicilian Flowers and Roll, £14 10s.; Rock, £9 a ton. Salt Cake is £10 10s. exported.

China Clay.

The Cornish China clay industry is feeling the depression in the paper and other trades very severely just now and some of the Canadian producers will be interested to hear that there is no demand in the United Kingdom at present for the mineral product. In fact one big seller said the other day that if he offered to sell at 2 dollars a ton he would not get an order for his China clay. It stands to reason, therefore, that the depression in trade is the cause of the China clay slump and not prices.

PULP EXPORTS REFLECT BUSINESS DULLNESS.

Canadian exports of pulp and paper for the month of February were valued at $8,668,815, compared with $9,391,927 in February 1920, a loss of $723,112, and were $994,236 below those of the preceding month. The month's returns mark the first actual net decline in the total value of these exports in a period of almost four years during which the saving has been consistently upward. The decline affected all grades of paper and pulp except book paper, which shows an increase of 3,742 cwts for the month. The decline in value is less marked than the decline in volume, newsprint showing a falling off of 100,497 tons, chemical pulp 18,987 tons and mechanical pulp 9,018 tons as compared with February last year. The figures show:

February	1920	1921	Gain or loss
Paper	$6,304,388	$7,039,839	$ 735,451 x
Chem. pulp	2,615,156	1,384,927	1,230,229
Mech. pulp	472,383	244,049	228,334
x Gain	$9,391,927	$8,668,815	$ 723,112

The paper exports for the month included 5,768 cwts. of book paper, valued at $89,220; 1,056,706 cwts of

EXPORTS OF PAPER, WOOD PULP AND PULP WOOD.

Exports of Canadian Produce.—Months of February 1920 and 1921; and eleven months ending February 1919, 1920 and 1921.

		Months of February.		Eleven months ended February.		
Paper: *Printing paper*		1920	1921	1919	1920	1921
Book paper	Cwt.	2,026	5,768	.....	43,210	60,574
	$	17,540	89,220	.....	394,393	723,576
Newsprint paper	Cwt.	1,266,653	1,056,706	.....	12,846,364	13,597,118
	$	5,290,398	6,256,050	.....	47,017,487	69,759,807
Printing paper	Cwt.	.....	.....	11,894,902	.....	.....
	$	.....	.....	36,127,821	.....	.....
Other paper	$	996,450	694,569	6,002,966	8,610,332	11,734,311
Total paper	$	6,304,388	7,039,839	42,130,787	56,022,212	82,217,694
Wood Pulp:						
Sulphate (Kraft)	Cwt.	181,672	103,520	.....	2,260,002	2,214,829
	$	600,722	471,722	.....	7,406,625	11,563,979
Sulphite, bleached	Cwt.	102,682	65,623	.....	1,067,776	1,784,589
	$	553,281	431,750	.....	5,449,753	14,189,805
Sulphite, unbleached	Cwt.	379,708	115,162	.....	4,343,940	4,632,127
	$	1,461,153	481,455	.....	16,268,404	27,068,664
Chemically prepared	Cwt.	.....	.....	7,793,694	.....	.....
	$	.....	.....	28,184,972	.....	.....
Mechanically ground	Cwt.	266,826	86,464	3,339,275	6,498,548	5,142,174
	$	472,383	244,049	4,253,361	7,821,111	16,207,726
Total Wood Pulp	Cwt.	930,888	370,769	11,132,969	14,170,266	13,773,719
	$	3,087,539	1,628,976	32,438,333	36,945,893	69,030,174
Pulp wood	Cord.	52,351	195,037	1,449,117	790,828	1,438,149
	$	539,429	2,774,159	13,978,457	7,956,819	19,171,099
Country of Destination. *Paper and manufactures of:*						
To United Kingdom	$	800,519	138,687	864,949	4,552,885	3,760,569
United States	$	4,799,648	5,818,447	34,285,522	44,467,576	64,598,960
Other Countries	$	704,221	1,082,705	6,980,316	7,001,751	13,858,165
Wood Pulp:						
To United Kingdom	$	231,191	106,816	145,927	4,530,668	7,785,090
United States	$	2,438,033	1,263,338	29,188,882	28,102,380	56,064,554
Other Countries	$	418,315	258,822	3,103,524	4,312,845	5,180,530
Pulp Wood:						
To United Kingdom	$	.....	.....	.....	.....	.....
United States	$	539,429	2,774,159	13,978,457	7,956,819	19,171,099
Other Countries	$	.....	.....	.....	.....	.....
Total paper, wood pulp and pulp wood:						
To United Kingdom	$	1,031,710	245,503	1,010,876	9,083,553	11,545,659
United States	$	7,777,110	9,855,944	77,452,861	80,526,775	139,834,613
Other Countries	$	1,122,536	1,341,527	10,083,840	11,314,596	19,038,695
Totals	$	9,931,356	11,442,974	88,547,577	100,924,924	170,418,967

newsprint, valued at $6,255,050, and other paper valued at $694,569.

Pulp exports included 103,520 cwts. of sulphate (kraft valued at $471,722; 65,623 cwts. of bleached sulphite, valued at $431,750; 115,162 cwts. of unbleached sulphite, valued at $481,455, and 86,464 cwts of groundwood pulp, valued at $244,049.

Countries of destination were: Paper — United Kingdom, $138,687; United States, $5,818,447; other countries, $1,082,705; Pulp, United Kingdom, $106,816; United States, $1,263,338; other countries, $258,822.

Unmanufactured pulpwood to the amount of 195,037 cords, valued at $2,774,159 was exported to the United States during the month, compared with 52,351 cords, valued at $539,429 in February, 1920.

For the first eleven months of the current year, April to February inclusive, pulp and paper exports reached a total value of $151,247,868, compared with $92,968,-105 for the corresponding period of 1920 and with $74,-569,120 in 1919, a gain of $58,279,763 over 1920 and of $76,678,748, over 1919. They were made up as follows:

Eleven months	1919	1920	1921
Paper	$42,130,787	$56,022,212	$82,217,694
Chem. Pulp . .	28,184,972	29,124,782	52,822,448
Mech. Pulp . .	4,253,361	7,821,111	16,207,726
	$74,569,120	$92,968,105	$151,347,868

Exports of unmanufactured pulpwood for the eleven months' period amounted to 1,438,149 cords, valued at $19,171,099, compared with 790,628 cords, valued at $7,956,819 for the corresponding period in 1920, and with 1,449,117 cords, valued at $13,978,457, in 1919, all of which went to the United States.

WHERE CANADIAN PULPWOOD CROSSES THE BORDER.

As my last letter was a short note relative to statistics on pulpwood and paper, I will try to give a summary of the points where Canadian wood enters the United States, writes G. B. Oberton, of Canton, N. Y. I will start at the state of Wisconsin and refer only the Fox River group. This includes all mills on Fox River from Lake Winnebago to where the river empties into Green Bay. A large percentage of the wood used here comes from Canada and enters at the following points:—

Across Lake Superior by vessels and in rafts to Ashland. thence by rail to the mills.

By vessel and in rafts to Green Bay, thence by rail and Fox River canal to the mills.

Railroad transportation by way of Sault Ste. Marie.

Now this does not imply that these mills are operated entirely on Canadian wood. It simply means a large percentage comes from Canada through the sources named. The local supply comes from the northern peninsula of Michigan and the northern part of Wisconsin. Canadian wood enters Detroit partly by boat and on cars in transit. Shipments of wood are also made to Erie, Pa. The water shipments come via St. Lawrence River, Lake Ontario, Welland Canal and Lake Erie. Wood delivered at the above-named point is used in the mills of Pennsylvania. Shipments are also made to these mills in cars via Buffalo and Niagara Falls, coming chiefly from Northern Ontario.

Coming east, the next place of importance is Oswego. This port is a water terminal for wood from the lower St. Lawrence River. The wood is delivered to mills on the Oswego River, a few miles away. Cape Vincent is also another water terminal for wood coming up the St. Lawrence. This place is one of the sources of supply for the mills on Black River. Ogdensburg is another transfer point for Canadian wood. As in the case of Oswego, wood is shipped by barge from the lower St. Lawrence and transferred to cars.

The large mill at Pyrites, owned by the "New York World", gets its supply of wood from the Ogdensburg terminal. Waddington. a few miles below Ogdensburg, is another water terminal for wood arriving from the lower St. Lawrence. Canadian wood is transferred from boat to cars and then delivered to the Remington-Martin Paper Company at Norfolk, N. Y.

Disregarding a mill here and there, I will next note the mills within a radius of twenty miles of Glens Falls, N. Y., which I will call the Hudson River group. Wood from Canada finds its way into this district by the following routes:—

St. Lawrence River, thence Richelieu River, Lake Champlain and Champlain Canal.

D. & H. RR. via Rouse's Point.

Central Vermont and Barton & Maine railroads with their connecting roads in the Province of Quebec. Wood from Canada enters New Hampshire and Maine from the west and north via Grand Trunk and Canadian Pacific railroads. Portland, Maine, is also a water terminal for wood from New Brunwick seaports. The wood is loaded on to cars and shipped to various mills in Maine, notably those of the International Paper Co.

Now some one may ask what percentage of the wood used in American mills is Canadian? The returns for the last year are not completed. A few years ago, however, Canada furnished 29 per cent. of the total amount of spruce used in American mills and poplar 16 p.c., and since then there has been a great increase. The figures quoted apply to the entire list of states, and do not afford an idea of the percentage of Canadian wood consumed in the regions that I have mentioned. For instance:—There are states that do not use Canadian wood on account of distance, notably, West Virginia, North Carolina and several others. Pennsylvania uses a large amount of hemlock and hardwoods, and only a comparatively small amount of spruce from Canada. This brings the average percentage of Canadian wood (as it applies to the entire list of states) down to the figures quoted from the "Department of Commerce and Labor". For instance, we will take the three groups of mills already noted, namely, the Fox River group in Wisconsin, and the Black River and Hudson River groups in the state of New York. It is quite safe to say that at least 60 per cent of the wood is from Canada. It will average higher than that for the Hudson River group and perhaps 75 per cent for the Black River plants between Carthage and Dexter, inclusive. The average does not include the St. Regis, Gould and Lexter sulphite companies, who, by the way are large woods operators in the Adirondack region nearby. I have only noted groups of mills using pulpwood. There are, however, a large number of American mills that do not use wood. There are five mills in the United States employing over 1,000 hands, of which two are in Maine, one in Pennsylvania, one in Maryland and one in Ohio. The mill in the last-named state is located between Dayton and Cincinnati and does not use pulpwood. — Canada Lumberman.

PULP AND PAPER NEWS

Elsewhere we give details of the appointment of four new directors to the board of the Riordon Company. As the company is one of the largest world concerns of its kind, it is natural that the more diversified board representation which has now been effected should arouse very widespread interest. No doubt the situation will speedily clarify in a manner which will make plain the meaning of these important changes. At the moment of writing, opinion seems to be that the changes in question point to a rounding-out, so to speak, of the Company's activities. It appears to be generally agreed that the additional board representation will bring even enhanced strength to a concern universally recognized as among the strongest of the strong. In various ways, the new directors are all men well qualified to bring high business acumen, as well as high business prestige, to the duties of their new offices. Mr. Frank P. Jones, vice-president and general manager of Canada Cement, Ltd., is an all-round man of business affairs with financial talent which is recognized on all sides. Mr. F. N. Southam, with his connection with a well-known publishing house, as well as with a large number of newspapers, brings to his new office experience of a different kind, as does Mr. F. E. Bronson, who is connected with extensive lumber and logging industries.

With regard to Mr. George M. McKee, the managing director of the Donnaconna Paper Mills, Ltd., and vice-president of the Canadian Pulp and Paper Association; who is the other new director of the Riordon Company, he is admittedly one of the strongest paper men in Canada. He has a rare knowledge of every department of the business. To start with he has the advantage of being a trained technical man. Then he is a man of sound business training and excellent judgment as well as of notable sagacity. In the words of one who knows him well, he is never apt to be misled by temporary conditions, but possesses, in marked degree, the capacity to see a situation steadily and to see it whole.

Montreal being such a centre of the pulp and paper industry, it is to be regretted that comparatively so few representatives of that industry from the city and district have found it compatible with their other engagements to attend the Convention of the T. A. P. P. I. which is being held in New York this week. Among those attending are Mr. P. B. Wilson, vice-president of the Spanish River Pulp and Paper Mills, Ltd., and president of the Canadian Pulp and Paper Association, Messrs. Howard Smith, president, and George A. Davidson, of the Howard Smith Paper Mills, Ltd.; Messrs. T. J. Stevenson, G. E. Challes and F. G. Robinson, of the Riordon Company, Ltd; J. Larkin, of the Federal Paper Company; and Mr. A. L. Dawe, secretary of the Canadian Pulp and Paper Association. Some Montreal paper merchants, including Messrs. Ernest Dawson and C. Macfarlane, are also attending the Convention.

Montreal jobbers report that while city business has been none too brisk, country business has picked up considerably in the past week, especially in respect of the demand for wrapping paper, etc.

It was announced last Monday by C. Howard Smith, president of the Howard Smith Paper Mills, Limited, that T. Palmer Howard, one of the directors of the paper enterprise, had been appointed comptroller of the company. The office, Mr. Smith stated, is a new one, its creation having been made necessary by reason of the great expansion in the scope and business of the company during the past few years. Mr. Howard's advent to the operating executive, would prove of substantial advantage in the heavier responsibilities involved through the extensions already embarked upon by the company. Mr. Howard is one of the best known business men in Montreal, being presently general manager of the Phoenix Bridge Company. He is also a past president of the Montreal branch of the Canadian Manufacturers' Association.

The salesmen of the various paper merchants in Montreal and district recently met the Canadian Pulp and Paper Association in conference when the arrangements being made to promote business through publicity were outlined to them. This was the first time that these salesmen had been brought together, and out of the meeting has come an interesting development. The suggestion was made that they should organize a paper salesmen's club and this suggestion has now borne fruit. A committee on organization, consisting of Messrs. E. T. Reynolds, H. Larkin, Henry E. Bell, and S. Rodier, has been appointed and this committee has drawn up by-laws which will be considered at a meeting to be held on Wednesday of next week, when the officers of the new club, which it is proposed to name The Paper Club, will be appointed. The purposes of the club are to bring about wider acquaintance among those engaged in the selling of paper and paper products; to assist in raising the efficiency of selling methods; to promote development of the highest sales ethics among its members; and to increase the use and sales of paper and paper products.

The executive of the Canadian Box Manufacturers' Association, with headquarters in Toronto, were in Montreal last Monday.

A circular letter, in the form of a questionnaire, bearing on the present conditions and the future outlook of the printing business, in its relation to the business of paper manufacture, was recently sent out by Mr. A. L. Dawe, secretary of the Canadian Pulp and Paper Association, to every printer in Canada. Replies to this circular have been received from the great majority of the printers, and these replies show that, in a general way, the printing fraternity's point of view is highly optimistic. In Western Canada, the printers report generally, that business is good and the outlook for the future still better. In the country as a whole, even though business is admittedly not up to normal, the general feeling seems to be that the tide has now definitely turned, and that from now on business will increase. Of course, there is some difference of opinion on the matter among the printers, but the majority

of them take the view that reduction has now gone sufficiently far to ensure a resumption of normal demands for printing within a very short time.

Negotiations are in progress for the sale of the North American Pulp and Paper Companies Trust's assets to a London syndicate.

Application has been made to the Montreal Stock Exchange by Price Brothers and Company, Ltd., for the listing of the stock of the new company which recently took over the old company as a going concern on a basis by which shareholders received five shares in the new company for each share of old company stock held. The application is for the listing of $42,683,200 of an authorized issue of $60,000,000 of common stock, consisting of 426,832 shares of a par value of $100 per share, of which 357,972 shares have been issued and are outstanding in the hands of the public. The balance of 68,860 shares are held to be exchanged for shares of the old company.

This week on the Montreal Stock Exchange has been remarkable for the activity and strength displayed by Laurentide. On Monday the issue moved up 4¼ points to 92½ and held the gain with 92⅜ bid for more stock. Most of the other paper issues, including Abitibi, Brompton and Spanish River, followed Laurentide's lead.

Fred L. Ratcliffe, head of the Ratcliffe Paper Company, Limited, York Street, Toronto, was elected vice-president of the Toronto Rotary Club at the annual meeting of that organization in Toronto last week.

Acting for the Attorney-General for Ontario, G. E. MacNab secured from the Master in Chambers, in Toronto, an order adding the Minister of Mines and Forests as party plaintiff in the action against the Shevlin-Clarke Lumber Company, arising out of the timber probe. According to the affidavit by R. T. Harding the addition is necessary "to enable the Crown to have all the rights out of all the transactions of the defendants or any of them with the defendant, and without the said minister the plaintiffs will not be able to have the liability of the defendants adjudicated upon."

That the Ontario Government intends to take legal action to recover from Hon. G. Howard Ferguson, ex-Minister of Lands, Forests and Mines, the files of letters, claimed by him to be private, which were removed from the department by his secretary, C. C. Hele, after the defeat of the Conservative Government, was plainly evident in a heated debate in the Ontario Legislature last week, when the bill to amend the Public Enquiries Act was up for discussion. The bill seeks to release the timber probe from the injunction proceedings brought by the Spanish River Pulp and Paper Mills Company, Limited. The Attorney-General told the House that he linked up with the subpoena proceedings for the production of the correspondence before the commission the injunction proceedings of the Spanish River Company to halt the whole proceedings of the Royal Commission.

The Frontenac Paper Box Company, Limited, has been granted incorporation by the Ontario Government with power to manufacture and deal in paper boxes and allied lines and to engage in a general printing and lithographing business. The capital is $40,000 and the head office is Kingston, the provisional directors being I. M. Bearance, M. J. McMahon and E. Mulholland.

A favorable progress report was received in Toronto last week respecting the operations of Clarke Bros. Paper Mills, Limited, in New Brunswick. Box-making was started a few days ago at Glen Falls, near St. John, with a plant of two buildings to make fibre board and corrugated and fibre board boxes. The fires have also been started at the company's pulp plant at Bear River, N.S. and it is expected that the cooking of pulp will commence this month. The original capacity of this mill was thirty tons per day, but this has been almost doubled with little extra outlay.

The office of S. J. Frame, trustee and assignee and secretary of the Canadian Box Board Manufacturers' Association, has been moved from 24 King Street W., Toronto, to 95 King Street W., the telephone number being Adelaide II.

NEW PULP PLANT FOR ALGOMA DISTRICT.

A pulp and paper mill in the district of Algoma, north of the Transcontinental railroad, near the Thunder Bay border line on the James' Bay height of land, is almost certain to be established before the duration of very many months. The Ontario Government is now asking tenders, which will be received up to June 15, for the right to cut pulpwood and pine timber in a large area situated near the Nagagami River, which would likely be the place for the erection of a mill. One of the conditions of tendering is that the successful tenderer must build a pulp and paper mill near or on the territory referred to, and no tenders are being accepted unless accompanied by a marked cheque for $50,000, which will remain on deposit until such a mill is built.

CONFERENCES FOR CLOSER CO-OPERATION.

The Laurentide Company, Limited, Grand'Mere, P. Q., have inaugurated a series of conferences between the inspectors, cullers and scalers of the Logging Department, with a view to secure closer co-operation between the woodsmen and those in the mill; to give them a better conception of the importance of various problems, and also to afford opportunities for the interchange of ideas and suggestions as how best to handle these problems. A great deal of the work is carried on at a considerable distance from the mills, and there is comparatively little contact between the men in the woods and those at the mill. This does not make for an understanding on the part of the woodsmen as to the relation of their work to that at the mill. The Laurentide Company have, therefore, arranged for visits to the mills, so that the men can see for themselves the sort of wood that can best be used and greater judgment exercised both in the sawing and culling.

BRANCH OPENED IN MONTREAL.

Owing to the rapid growth of their business in Eastern Canada, the Diamond State Fibre Company of Canada, Limited, with Head Offices and Works in Toronto, have found it necessary to open a Branch Office at 84 St. François-Xavier St., Montreal. Mr. J. Alexander Regan will be in charge of the Montreal Office. The opening of this Branch will facilitate the effective handling of their increased Eastern business.

A newspaper report recently stated that the Brown Company intend building a paper mill at Three Rivers, P.Q. On taking up the matter with the Company, the Pulp and Paper Magazine is informed that they have no such plans.

Technical Section

REVIEW OF RECENT LITERATURE.

A-3; R-1. A new pulp. World's Paper Trade Review, lxxiv, 26 (Dec. 24, 1920). A mill on the Parana river, Brazil, was to have begun operations in September. It is using a raw product, a species of bog grass called "paja brave". This grass grows during the whole year and is very abundant. The mill is equipped to make only pulp in sheets and strawboard for paper boxes and has a capacity of three tons of strawboard a day. It is planned to increase the equipment later in order to make finer pulp and to obtain greater production.—A.C.

A-11. Selection and testing of paper fillers. E. G. MILHAM. **Paper Industry,** ii, 9 (Dec. 1920). The mineral fillers commonly used are china clay, talc, sulphate of lime, ground feldspar and lime carbonate. A good filler should have the following properties: Moisture should be low, color should be a clear bright white, should be free from dirt, grit and hard lumps, should mix readily with water to form a smooth cream, should not foam with an excess of alum solution, should be comparatively insoluble in water.—C.J.W.

A-11. Examination of china clay.—China Clay Review, ii, (Dec. 1920). A typical chemical analysis of china clay given by Heath.—A.C.

A-14. Paper testing. World's Paper Trade Review, lxxiv, 26 (Dec. 24, 1920). A detailed account of the testing of paper, together with an account of the variations and their sources, which arise in the estimation of composition and properties of paper.—A.C.

A-14:K-O. Fiber length and position. W. CODLITZ **Paper Trade J.,** lxxii, 2 (Jan. 6, 1921).—A strip of paper 10 by 15 mm. is gripped by a pair of special pincers so that a certain length protrudes, moistened to remove sizing, and then brushed from both sides until only fibers remain. The fibers shorter than 5 mm. have been brushed away. The weight of the fibers removed is determined after drying. The operation is repeated until all the various lengths have been determined. The largest amount of fibers and accordingly the longest fibers are not found in the straight longitudinal cuts but when paper was cut at an angle of 30 degrees. Thus, paper ought to be cut at this angle to secure the greatest tenacity.—C.J.W.

B-7. Costs in woods operations. D. A. CROCKER. **U. S. Paper Maker,** lxii, 24 (Nov. 15, 1920), **Paper Industry,** ii, 9 (Dec. 1920). This is a discussion of the manager's point of view as to the current cost of his operations, with particular reference to the methods used by the Eastern Manufacturing Company.—C.J.W.

B-9. Finland's timber and paper industries. — LESLIE A. DAVIS.—**Paper Trade J.,** lxxi, 8 (Feb. 17 1921).—Statistical review.—C.J.W.

B-9. The pulpwood situation. HUGH P. BAKER. **U. S. Paper Maker,** lxii, 24 (Nov. 15, 1920). There are trying times ahead of the paper industry because of the thoughtless way in which we have forged ahead, assuming in our good-natured American way that somehow wood would be forthcoming. Pulpwood and pulp are not going to be materially cheaper over a period of decade.—C.J.W.

B-9. National and State forest policies.—FRANK L. MOORE. **U. S. Paper Maker,** lxii, 24 (Nov. 15, 1920). Report of committee on Forest Conservation at fall business conference, Nov. 11, 1920. Proposed legislation for the nation and the individual States is given. —C.J.W.

B-9. The wood pile, the foundation of the paper industry. HUGH P. BAKER. **U. S. Paper Maker,** lxiii, 4 (Jan. 15, 1921). **Paper Trade Journal,** lxxii, 3 (Jan. 13, 1921.) There are enough productive forest lands east of the Mississippi river to give us the forests which will not only produce all the wood we need for the paper industry in the future in this country, but will make us a much greater export nation as far as pulpwood, pulp, and paper are concerned, than any other nation in the world.—C.J.W.

K-10. Substitutes for alum in sizing paper. W. E. BYRON BAKER. **Paper Industry** ii, 9, (Dec. 1920). Ferrous sulphate may be used in the lowest grade papers, but in the better grades it causes discoloration and also impairs the strength of the sheet because of the alternate oxidation and reduction. Niter cake or sodium bisulphate may be used to replace half the alum. When used alone, niter cake will not produce nearly so bulky a precipitate, and to secure the same desired sizing effect it is necessary to increase the amount of size per ton. Sulphuric acid may be used as a size precipitant but does not produce so bulky a precipitate as niter cake. Magnesium and zinc sulphates may also be used; they form bulky precipitates, have a slightly lower precipitating power than alum, and leave a neutral "back water" in the beater. They must be substituted for alum when viscose is added to the beater. In the usual methods of paper manufacture, some form of acidity (niter cake or sulphuric acid) should be added, so as to have the back water acid.—C.J.W.

K-20. Parchment making. World's Paper Trade Review, lxxiv, 26 (Dec. 24, 1920). A short account of the process of making parchment and uses made of the margins left after cutting.—A.C.

L-5. Cellulose acetate. H. J. H. FENTON and A. J. BERRY. Proc. Camb. Phil. Soc., **20,** 16-22, (1920); J. Soc. Chem. Ind., **39,** 624A, (Sept. 30, 1920). Various substances have been tried as substitutes for acetone as solvent. The authors find no objections to esters as dope constituents, and as far as weak acids are concerned, tensile strength detns. gave excellent results, fabrics doped with acetic acid as the principal solvent comparing most favorably with others. No general conclusion can be drawn as regards the chem. nature of a liquid and its solvent action on cellulose acetate, but there appears to be some relation between the dielectric constant and solvent action. For the detn. of the acetyl group the authors prefer Ost's method of cold alkaline saponification (J. Soc. Chem. Ind., **31,** 713, 1912). Cellulose acetate differs considerably from cellulose in its power of adsorbing various dyestuffs.—A.P.-C.

L-6. Alkyl celluloses: methods of preparation and uses. CLARENCE J. WEST, Information Dept., A. D. Little Inc. Paper, 15,32,34. (Aug. 4, 1920). Translation of an art. by Wedorf in Kunststoffe, June 1, 1920. A description of the Lilienfeld patents. Eng. patents No. 12,854 (1921), 6,035 (1913); U. S. patent No. 1,188,376; Fr. patent No. 468,162; Swedish patent No. 66,512. The general method of preparation consists in treating the cellulose with the Etester of inorganic acids e.g., EtCl, EtBr, Et_2SO_4, in the presence of alkali. The properties and various possible uses of the cellulose ethers are described.—A. P.-C.

L-7. Artificial wool from cotton waste. South African J. of Industries; Chem. Met. Eng., **23,** 696, (Oct. 6, 1920). A process has been discovered by which artificial wool can be produced from cotton waste; the basis of the artificial wool is cellulose acetate, and it is claimed that the material is an even better insulator against heat and cold than ordinary wool, that it will wear well and that it can be dyed any color. One of its limitations is its liability to break and its inelasticity which prevent its use in the production of yarns on the worsted principle.—A.P.-C.

L-O. Paper handkerchief and container. Can. patent No. 204,810, S. B. McCUTCHEON and C. C. WHARTON, Richmond, W.Va., U.S.A., Oct. 19, 1920. An outfit of the character set forth comprising a plurality of handkerchiefs each having a tab extending from one corner thereof, a paper bag into which the handkerchiefs are to be placed after being used, and a waterproof paper envelope in which the handkerchiefs and bags are packed and sealed for sale. Claims allowed 5.—A.P.-C.

L-O. Production of mats of fibrous materials. Can. patent No. 204,944, The C. F. Burgess Laboratories, assignee of H. F. WEISS, Madison, Wis., U.S.A., Oct. 19, 1920. The herein described process for producing from wood fiber a highly absorbent product, which comprises the steps of reducing the wood to a cellulose pulp, washing and drying said pulp, mechanically shredding it in air into a uniform, porous, and fibrous mass with a spray containing adhesive material to cement the fibers together. Claims allowed 16.—A.P.-C.

L-O. Sanitary paper slipper. Can. patent No. 205,013, D. J. BIRKETT, Honolulu, Hawaii, Oct. 26, 1920. A thin fibrous paper web arranged to be formed into a slipper whereby a foot may be covered while a shoe is being fitted thereon to prevent infection by said shoe, said slipper being adapted to readily conform closely to the foot so as not to interfere with proper fitting. Claims allowed 9.—A.P.-C.

M-8. Pump for acids. Can. patent 198,770, H. TOBLER, Hackensack, N.J., U. S. A., March 30, 1920. Claims allowed 15.—A.P.-C.

M-8. Attachment to pump to prevent the entrance of sand thereto. Can. patent No. 202,732, H. L. PEARSE, "The Gums" Station, near Mount Mary, S. Australia, Australia, Aug. 10, 1920. An attachment to a pump for the purpose set forth, comprising a length of pipe attached to the bottom of the pump, and forming the suction pipe of same, a cylindrical chamber encircling said length of pipe and having inlet openings at or near the top and a closed bottom, the closed bottom being slighty below the bottom of the pipe, and a screw-threaded cap whereby the cylindrical chamber is attached to the length of pipe. Claims allowed 5. —A.P.-C.

N-4. Returning condensate directly to the boiler. GEORGE S. BARKER. Paper, 26, 28, (Sept. 22, 1920). Description of the Simplex Condensation Pump and Simplex Boiler Feeder made by the Farnsworth Co., Conshocken, Pa.—A.P.-C.

N-4. Fuel economy symposium at the 6th Chemical Exposition. Chem. Met. Eng., **23,** 658-60, (Oct. 6, 1920). Brief acct. of the papers presented. In "**Burning Coal at 100% B. T. U. Efficiency**", W. O. Renkin strongly advocated the use of powdered coal as being the most efficient method of burning coal. He illustrated this with a chart giving the relative B.T.U. recovered in the boiler room for 1c. at present fuel prices. The early mechanical difficulies in connection with the prepn. and distribution of powdered coal have been commercially overcome, thereby making it possible to use much of the low-grade coal heretofore wasted, and coal having as high as 25% ash can be used easily and efficiently. In burning coal in powdered form all excess air is always under control and can easily be eliminated when necessary, as the powdered coal is fed into the furnace in a cloud where each particle quickly unites with the air needed for combustion, thus securing the greatest B.T.U. efficiency. In "**Saving Fuel by Controlling Chimney Losses**" F. F. Uehling stated that no matter what kind of fuel was used the biggest loss is always due to the heat energy wasted up the chimney. The extent of this loss depends on 3 factors: Excess of air in the products of combustion, which is detd. by the % of CO_2; the amt. of unburned fuel in the products of combustion, indicated by the % of CO ; the temp. of the products of combustion, which can be detd. with an ordinary flue thermomether in the last pass just before the gases enter the stack. The practice of instructing the firemen to keep the % of CO_2 as high as they can has led to surprisingly good results in reducing the chimney losses. In "**Reducing Conduction and Radiation Heat Losses**", S. L. Barnes describes the advantages of insulating bricks composed of diatomaceous earth (kieselguhr). Insulating bricks of diatomaceous earth are claimed to be fully ten times more efficient as non-conductors of heat in the construction of high temp. equipment than are firebrick or ordinary red brick. In "**Increasing Conduction and Reducing Fuel Consumption**" W. R. Van Northwick described the detrimental influences of soot and feed water scale on boiler efficiency. "**Fluid Heat Transmission**" by Alexander B. McKechnie. In the design of a fluid heat transmission system there are 5 Fuel economy symposium, main factors requiring most careful study: design of heater or absorbe, type of circulating pump, type of system, quality of circulating oil, and construction of pipe lines. The efficiency of a properly-designed and engineered system compares favorably with that of high-grade boiler construction. Other papers read were "**Producer Gas and the Modern Mechanical Producer**" by W. B. Chapman; "**Refractory Cement: Life Insurance for a Furnace**", by F. W. Reissman; "**The Reason for the Fuel Saving in the Dressler Kiln**", by Conrad Dressler.—A.P.-C.

R-9. Paper tariff hearing.—Paper Trade J., lxxiii, 7 (Feb. 10, 1921).—The complete report of the testimony presented to the Ways and Means Committee of the House to show why the manufacturers of paper in this country should be protected against future foreign competition. The article contains a great deal in the way of valuable statistics of the industry.—C.J.W.

UNITED STATES NOTES

George H. Carter, who has been clerk of the Congressional Joint Committee on Printing since 1911, was confirmed last week as President Harding's appointee for the place as Public Printer. Mr. Carter, prior to the time he became connected with the Committee on Printing, had been secretary of the Printing Investigating Committee. He was also associated since 1911 with the Special Committee on Government Paper Specifications. Born in Mineral Point, Wis., in 1874, Mr. Carter received his early education at the Le Mars, Ia., High School. Beginning as a typesetter and job press operator at Le Mars, Mr. Carter held down places in various editorial capacities on the staffs of numerous papers in the Middle West until 1907 when he became copy editor and assistant telegraph editor of the Washington Post. In 1909 and 1910 he was Washington correspondent for various Iowa newspapers. The new Public Printer is the author of the Congressional Printing Handbook and compiler of numerous Congressional documents. He last year completed a course at the George Washington University Law School and was admitted to the bar of the Supreme Court and the Court of Appeals of the District of Columbia. Mr. Carter is a charter member of the National Press Club of Washington and honorary life member of the International Printing Pressmen and Assistants' Union of North America. He is also a Knight Templar, Shriner, and 33d degree Mason, honorary inspector general, and belongs to the Phi Kappa Psi Fraternity. He was married in 1904 and has one daughter.

The eastern sales office of the Nuera Paper Company at 200 Fifth Ave., New York, will be in charge of William B. Hunter after April 16. Mr. Hunter is severing his connection with the American Writing Paper Company which he served for six years, four of which were spent in the various mills and two in the New York sales offices of that company. The Nuera Paper Company is manufacturing at Hadley, N. Y., all kinds of paper specialties, including photo mounts, calender backs, box covering, regular cover paper, cover specialties, jute and manilla tag, and box boards.

The Penobscot Chemical Fibre Company, Old Town, Me., is planning to utilize white birch as a base for pulp manufacture. Results of experiments are said to have been so satisfactory both with this and other kinds of wood that it is believed that in another year practically every kind of tree of the company's tract will be peeled for use in making pulp. While all trees are not equally adaptable to the making of pulp, the harder ones, cooked longer and mixed with the softer varieties, make the supply hitherto depended on for the making of pulp go much further.

A permanent exhibit of hand-made paper appliances is being prepared to fill cases in the Graphic Arts Division of the United States National Museum, Smithsonian Institution, Washington. It is to include examples of laid moulds of different sizes which have been used for making hand-made paper in old established mills in Europe. Also moulds which have been used in forming light-and-shade watermarked portraits —the most complicated form of water-marking paper. The dies and appliances used in making these moulds are shown, as well as specimens of paper from the moulds. Samples of paper with the watermarks may be seen, dating from the middle of the fifteen century to the present, showing the different stages of development that took place in the laid and wove moulds during that period. Deckle edges of all varieties are to be exhibited, also illustrations and photographs of old mills interiors, heating engines, etc.

According to figures just given out by the United States Department of Agriculture, the Coast States of Oregon, Washington and California hung up a new record for consumption of pulpwood in 1920. The statistics show that the amount of pulpwood consumed in the three States last year exceeded the highest record previously made by 23,000 cords, or 7.4 per cent. The 1920 production exceeded that of 1917 by 14 percent.

Directors of the Minnesota and Ontario Paper Company have announced a further reduction of $17 a ton on newsprint paper to publishers. This concession, together with that of $8 a ton made on January 1, reduces the price from $138, as fixed by contract until July 1 next, to $113 a ton for the next three months.

With the completion of their third plant, adding 110,000 square feet to its floor space, Owens and Traeger, Hoboken, N. J., are now running what is reputed to be the largest solid paper box factory in the world. The combined plants have total floor space of about 200,000 square feet. The new plant is the last word in fireproof construction and combines all the features of the most up-to-date factory buildings. The waste and dust of the factory is all taken to a fireproof chute, by which it is conveyed to the first floor in each plant where it is baled up in a fireproof vault. The several buildings are equipped with complete sprinkler systems. The concern manufactures everything in the stiff paper box line from the cheap carton to the finest satin lined boxes, covering the requirements of such concerns as soap makers, perfume, face-powder, candy, shoe and other manufacture. Shipping containers and folding boxes are also being added to the firm's line, and plans are under way for the making of mailing tubes and round boxes with either paper or tin caps. The company delivers to any point by motor trucks and car-load lots.

An engineering department, equipped to furnish counsel on all matters relating to the mechanical end of the paper converting industry has been formed by the Industrial Foundation, Inc., 50 Union Square, N. Y. The work of this department will cover the practical development of ideas and patents, supervising the equipping of new plants, counsel on operating efficiency of established plants, the designing and building of special machinery and general advice and research work. Kurth Wendell, president of the Foundation, will be in charge of the department, assisted by able associates.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, April 9. — Business in both pulp and paper circles continues dull with little improvement reported either by the manufacturers or jobbers. Printers are buying very little stock and the job printing houses are quiet, while the fact that there is a possibility of a strike over the demand of the printers in most of the larger cities of Canada for a 44-hour week and an increased wage scale, which may come to a head on May 1st, is not calculated to improve matters. Comparatively few of the pulp and paper mills are running at capacity, with the possible exception of the newsprint machines, which are busy, although there is no great demand for newsprint for spot delivery. In practically all lines of paper the demand is strictly limited to the requirements of the moment, due to the fact that there is no stable market and the impression prevails that prices have still got to go lower. Few transactions are being made in either mechanical or chemical pulp and the demand is very slack. Ground wood is still quoted at from $40.00 to $50.00, easy bleaching sulphite at $95.00 to $100 and news grade sulphite at $70.00 to $80.00, but in some instances deals have been closed at slightly delow these figures.

PULPWOOD. — Pulpwood contractors report that there is practically no market for pulpwood at the present time and the whole industry appears to be in a state of suspended animation. No contracts are being made, the mills holding off until they find out what is going to happen. They have large quantities of pulpwood on hand and as there has been a very large reduction in consumption, none of the mills are able to say just what their requirements are going to be for next year. Of many mills that were communicated with by a contracting firm in Toronto, only one was in a position to give any idea of what they would be wanting next year, a situation which is readily understood, partially from the fact that no price for next year's supply has yet been fixed. Heretofore the price has been fixed from a month to six weeks before the present date. The Toronto contractor referred to above states that his company is shipping some wood still, but it is on old contracts. The prediction is made that the production of sap-peeled wood will be large this year, the impression being general among the farmers that they will not be able to sell their rough wood next year.

BOX BOARD. — Both box board mills and jobbers are going through a very quiet period. The demand is light and none of the mills are running at capacity. The Campbellford mill of the Canada Paper Board Company is running six days a week, Montreal four days and the Frankfort mill four days a week and other mills in this line are running correspondingly light. There have been no changes in prices of late, chipped board being still selling at $60. Dealers report that very little board is being imported from the United States.

BOOK PAPERS AND BONDS. — Although the demand in these lines is light enough orders are coming in to considerably help in the reduction of jobbers' stocks which are gradually getting down to normal again under the policy of conservative buying from the mills. Orders continue small in size but fairly satisfactory in total bulk. No. 3 book, m. f. is quoted at $11.75 and s. c. at $12.25, with No. 2 m. f. at $12.85 and No. 2 s. c. at $13.35. No. 1 m. f. is selling at $14.00 and s. c. at $14.50, these prices f.o.b. mills. In sulphite bonds, whites are selling at 18c, tints at 19c and colors at 20½c with sulphite ledgers half a cent in advance of these prices.

WRAPPING PAPERS. — Stimulation of such lines of trade as the ice cream and confectionary business, due to the warmer weather, has reflected itself to some extent in wrapping paper sales, although on the whole, business in this department of the paper trade is dull and mills and jobbers are finding it hard to get business. A feature of the trade appears to be that collections by jobbers for goods sold have kept up fairly well during the slack period and the percentage of losses has been comparatively small. Active selling campaigns by both mills and jobbers are only yielding small orders and it appears doubtful if prices have yet reached rock bottom. In the meantime goods are selling at prices as last quoted in these columns.

GUMMED PAPER. — Manufacturers of gummed papers report that business has been very dull for the past few months, although an improvement has been noticed, March having been a fairly satisfactory month. Gummed Papers, Limited, Brampton, Ont., report that they have been able to keep their machines running and the indications are that they will not have to shut down for want of orders at any time. Prices on all materials have, of course, been dropping and the orders that are coming in are small and customers apparently have the impression that the bottom has not yet been reached. The company mentioned writes: "We have taken the opportunity of this dull period for overhauling our machines and installing other machines of an improved type and expect to be better prepared than ever to take care of the gummed paper, waterproof paper and cloth lined requirements."

RAG AND PAPER STOCKS. — There have been no new developments in prices on cotton cuttings during the last week. Mills remain uninterested in offerings and the market therefore has been purely nominal. Occasional small lot transactions have been reported, but the volume of business done has been lower than ever. Dealers in most cases do not know what to quote and show little interest in packers' offerings unless the price is sufficiently low to protect them against further decline. The one favorable feature in the market has been the fact that production of cuttings has continued very restricted. No. 1 white shirt cuttings have been dull with sales made as low as 10½c. The market on old cotton rags has been showing easiness in spite of the fact that to most packers present prices seem too low for any of them to want to do business. Paper mills have not reported any increased operations, and orders from them are very

difficult to obtain until demand from this source picks up. Dealers state that they will remain, as far as possible, out of the market, and will buy practically nothing from smaller packers.

ROOFING RAGS. — The roofing manufacturers have shown a little more interest than the paper manufacturers, but the total business done with them has not yet been sufficient to keep prices firm. An added factor in the easy tone of the market has been the fact that at this time of the year it is usually expected that prices will ease on account of Spring collections of rags. Country mills have large stocks of mixed rags on hand, and with the present freight rates it is hardly likely there will be as much collection this summer. The roofing rag situation has been easier, one large dealer having reported being able to buy a tonnage of mixed satinettes as low as 60 to 65 cents per cwt.

WASTE PAPER. — The situation in the waste paper market has not changed for the better: if anything the demand from the mills has been smaller than ever. Nearly all paper manufacturers are running at a fraction of capacity while some have been closed entirely. Except when in need of special grades of stock for immediate use, mills stay out of the market, and dealers have been unable to make sales without further concessions. The fact is that most dealers realize that pressing for sales at this time is an almost futile job, and have been standing back waiting for the demand to revive. Few dealers care to say definitely when this revival is to be expected, but the opinion is that the position of this market must soon change for the better. This opinion, it might be stated, is based on hope rather than any foundation of fact. The price on mixed papers has become so low that even when stock is obtained from producing sources for practically nothing, the cost of labor and freight prevents any profit. In regard to the lower grades this situation seems more or less hopeless. At present mixed and newspapers have been influenced by the fact that ground wood has sold at very low levels during the past week. The prices quoted are to be considered as purely nominal. Actual sales are being made in some instances at considerably less than these prices.

	Per Cwt. f.o.b. Toronto.
No. 1 shirt cuttings	$10.50—11.00
No. 1 unbleached cotton cuttings	7.00— 7.50
No. 1 fancy shirt cuttings	6.50— 7.00
No. 1 blue overall cuttings	7.00— 7.50
Bleached shoe clip	8.50— 9.00
White cotton hosiery cuttings	11.00—12.00
Light colored hosiery cuttings	10.00—10.50
New Light flannellette cuttings	8.50— 9.00
No. 2 white shirt cuttings	6.50— 7.00
City thirds and blues (repacked)	1.40— 1.60
Flocks and satinettes	.70— .80
Tailor rags	.60— .65
Gunny bagging	.80— .90
Manila rope	2.75— 3.00
No. 1 white envelope cuttings	3.00— 3.50
No. 1 soft white shavings	2.75 3.00
White blanks	1.40— 1.50
Heavy ledger stock	2.25— 2.50
No. 1 magazine	1.60— 1.70
No. 1 book stock	1.20— 1.30
No. 1 manila cuttings	1.50— 1.60
No. 1 print manila	.70— .80
Folded news	.60— .70
Over issue, news	1.00— 1.15
Kraft	1.60— 1.80
No. 1 clean and mixed papers	.35— .45

NEW YORK MARKETS.

New York, April 9 — (Special Correspondence.) — Aside from a further sagging of prices on some grades, the paper market has lacked important development this week. There is still very little demand of note. Buyers are operating solely in hand to mouth fashion, and the spot trade is almost at a standstill. In fact, were it not for the customary amount of contract business, the market would be nearly altogether inactive. The manner in which consumers are buying paper clearly reflects the dullness prevailing in various lines, and judging from the way in which matters are shaping up it begins to look as if there will hardly be any worthwhile improvement in general commercial conditions before the autumn.

Quotations on both finished paper and on raw material are steadily moving lower. Notwithstanding that production of paper and board, as well as pulp, rags and other raw stock, has been greatly reduced, the market is unquestionably topheavy with supplies, and this condition tells the story. It is not surprising that prices are falling when there is not demand enough to absorb the goods placed on the market; moreover, there appears little likelihood of the decline in values being checked until demand broadens considerably.

In a statement issued several days ago, President Philip T. Dodge of the International Paper Company says that the mills of his company are operating at only 50 per cent. of capacity owing to the recession in newsprint demand. President Dodge traces the present market condition back to the action of publishers in 1920, when it was feared newsprint production would fall short of their needs, and when they swept the spot market, here and abroad, bare of supplies at fancy prices, taking no account of the cessation of wartime prosperity in general business. When publishers, finally encountered some curtailment of advertising, Mr. Dodge states, they stopped buying paper and began to use their stock. Some of this stock came back into the spot market, and, although small in quantity, this with imported newsprint was sufficient to break the narrow spot market. Mr. Dodge points out that charts compiled by the Newsprint Service Bureau show that inventories of mills and consumers are slowly but very steadily diminishing, and says that the time is not far off when publishers will again have to buy at a rate equal to their consumption. He also emphasizes that Federal Trade Commission figures show February production of all grade of newsprint was far less than the February, 1920, production and even less than in February, 1919, with stock on hand at all mills at the end of February equal to but nine days' supply. Mr. Dodge believes that prices on newsprint must stay high for a year or more because it will take that long to use the pulpwood bought at wartime prices. Also, he says, increased freight rates have cut heavily into profits, for it requires three tons of materials and coal to make one ton of paper. Advancing freights in the last three years, he asserts, have added $9.60 per ton to the cost of manufacturing newsprint.



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The contract basis on newsprint remains unaltered, with the I. P. price 5.50 cents per pound at mills for standard rolls, and with smaller producers quoting from this figure down to around 5 cents. The spot market is bordering into demoralization. There is very little demand of worthwhile proportions and the offering of so-called distress lots at extremely low levels is greatly disrupting prices. Manufacturers are quoting in the neighborhood of 5 to 5.50 cents a pound at mills, but with buyers able to get supplies at considerable below these figures, they obviously are absorbing few or no lots at the basis asked by mills.

Additional declines have occurred in book papers. Machine finished book is available down to 7.25 cents a pound, with quotations ranging from this point up to 9 cents for the better grades. Super book is offered in at least some quarters at about 9 cents, while coated book is quoted at from 11 to 13 cents a pound. Most of the coating mills are reported closed down and filling current orders from stock.

Down to as low as 85 cents per ream has been reported quoted on No. 1 white tissue, basis 20 x 30, and No. 2 white and No. 1 Manila tissue are offered at 80 to 85 cents a ream. Even at these prices there is but a slight demand for tissue paper. The leading producer of No. 1 domestic kraft wrapping paper has reduced its prices to 8 cents, which means that other manufacturers quote around 7.50 cents. There is also a lack of important demand for wrappings, and all grades tend lower in price. Rogus wrapping is said to be available at as cheap as two cents per pound.

Fine papers are moving merely in limited-sized quantities and at gradually declining prices. An average good grade of sulphite bond is to be had today at 12 cents a pound, with one of the leading producers in the States quoting 14 cents on a widely sold brand. An average of prices on all-rag bonds is in the vicinity of 28 cents per pound.

Boards display little fresh trade activity. Some mills have jacked up prices slightly but there is at least one large manufacturer in the East offering plain chip at $30 per ton and filled news board at $32.50, and the bulk of buying done is at about these figures. Board mills as a whole are running at only approximately half of capacity, despite which they are having difficulty disposing of their output.

GROUND WOOD.—Quotations on mechanical wood pulp have touched new low levels. There have been sales recorded this week down to $30 per ton at producing plants, and while possibly only distress lots have been sold at this basis, the fact remains that consumers have secured some supply at this low level, and consequently are indisposed to pay more. Grinders in various parts of the country are reported closing down their plants rather than make pulp for which they have no outlet, and there are those in the trade who believe that this loss of production will have telling influence on the market later when consumption increases. Offerings of good-sized tonnages of prime spruce ground wood at around $35 a ton are quite numerous and receive but little reception from buyers.

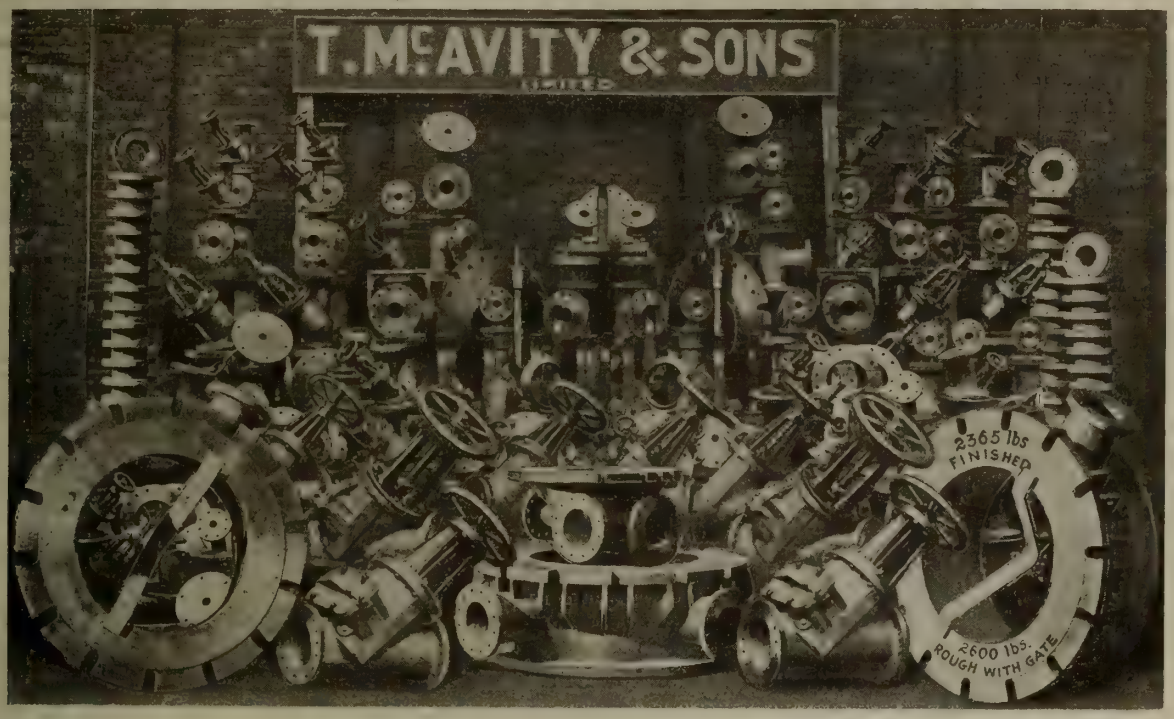
CHEMICAL PULP. — The chemical wood pulp market continues in the doldrums insofar as concerns the volume of business being transacted. Consumers are operating as buyers in the same way that has marked their activities for several months, and are absorbing but small amounts of pulp against direct requirements. It is indeed difficult to ascertain what values are. The market lacks a definitely established price basis, and pulp is being disposed of in some cases at surprisingly low figures. Foreign pulp, for example, is being offered on the spot in this country at prices far below replacement costs at primary sources. Swedish manufacturers quote in the neighborhood of 8 cents per pound for No. 1 bleached sulphite for forward shipment, whereas spot pulp of this kind is available in at least small lots at 6 cents ex-warehouse. Recent quotations on Swedish easy bleaching sulphite for shipment from the other side range around 6 cents, while spot easy bleach can be bought at 4.75 to 5 cents, and Scandinavian kraft pulp is offered on spot in New York at less than 4 cents, although shipment prices on the same grade of pulp in primary markets are up around 5.25 cents. This situation would infer that owners of imported pulp now in the United States are pocketing rather severe losses in liquidating their stocks.

RAGS. — There is very little trading current in papermaking rags. Consuming mills are mostly keeping entirely out of the market, while those few which are buying are taking only minor quantities actually needed for immediate use. Prices are soft and are moving lower. Roofing rags have declined this week after having held relatively steady for quite a period. Purchases of No. 1 roofing by felt mills have been reported at 85 to 90 cents per hundred pounds at shipping points, and of No. 2 packing at 75 to 80 cents. New cuttings are scarcely wanted at any price and it is questionable how long they can be obtained. Old whites and blues are selling in small parcels at basic prices of approximately 6.50 cents for No.1 repacked whites and 2.50 cents for repacked thirds and blues.

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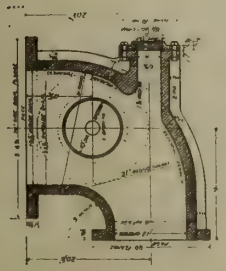
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PAPER STOCK. — The market for low grades of old paper is completely demoralized. Demand has all but entirely disappeared and prices have sunk to levels where packers are obliged to lose as much on stock as they receive for it. No. 1 mixed paper is freely offered at 25 cents a hundred pounds at shipping points, and there have been some sales at under this level. Folded newspapers have commanded few buyers among mills at 35 to 40 cents. Overissue newspapers have sold at 50 cents, white new cuttings at 1.50 cents, heavy flat magazines at 90 cents and old No. 1 kraft paper at 1.40 cents. Conditions are such that dozens of small collectors and packers are being forced out of the industry in New York and elsewhere because they cannot make a livelihood from their operations. Consuming mills are not in need of supplies owing to their curtailed production, and haven't the facilities for storing up more than they now have on hand; consequently the movement of stock toward mills is close to a standstill. Shavings are in light demand and are quoted at around 3.25 cents for No. 1 hard white and 2.25 cents for No. 1 soft white. Ledger stock is offered at around 1.50 cents at shipping points without attracting many buyers.

OLD ROPE AND BAGGING. — Old rope holds comparatively firm in price, this being evidently due more to light stocks and small importations than to any voluminous demand from paper mills, and No. 1 rope is bringing between 3.75 and 4 cents per pound at shipping points. Old bagging is little wanted and is strictly nominal in price at around one cent a pound.

IMPORTANT NEW ADDITIONS TO RIORDON BOARD.

A number of interesting changes in the board of directors of the Riordon Company, Limited, were announced over the week end, following a meeting of the board on Saturday. Charles Riordon has retired from the presidency of the organization, becoming honorary president, and is succeeded by his son, Carl Riordon, formerly vice-president. Frank P. Jones, succeeds Carl in to the vice-presidency, and it is expected that he will take a broad, active interest in the management of the company from now on. Three other new members were added to the personnel of the board in the persons of George M. McKee, Donaconna, Que., F. N. Southam, Montreal, and Fred E. Bronson, Ottawa, Ont.

Nothing was said on the conclusion of the meeting regarding the new financing which the company has in contemplation, but some developments are expected during the course of the next week or so, which will cast greater light on the matter.

The new directors added to the board, have broad Canadian financial and business connections.

Frank P. Jones, who was elected to the vice-presidency is one of the best known of Montreal's younger business and financial men. He is vice-president and general manager of the Canada Cement Company, Limited, and is also connected with a number of other prominent Canadian organizations including: director, Canadian Bank of Commerce; director, Montreal Trust Company; director, Ontario Steel Products, Limited; and president Consumers' Glass Company, Limited. A native of Brockville, Ont., Mr. Jones, when he graduated from the Royal Military College at Kingston, began his business career for the D. F. Jones Manufacturing Company, Gananoque, as fireman. He later joined the sales force of the Nova Scotia Steel and Coal Company, later joining the Dominion Steel forces. He became general manager of the Canada Cement Company in 1910.

George M. McKee, another new addition to the board was recently elected to the vice-presidency of the Canadian Pulp and Paper Association. He is managing director of the Donnacona Paper Mills, Limited. He has been associated with this company since its inception in 1912. Mr. McKee is given a great deal of credit for the company's success, and it was he who conceived the idea of naming the company and its mill after the old Indian chieftain Donnaconna. He has been largely instrumental in building up the company's business in the past decade, and the founding of the prosperous community of Donaconna, the mill's townsite. He is a member of the American Society of Mechanical Engineers, and a member of the American Electro-Chemical Society.

F. N. Southam, Montreal, is vice-president of William Southam & Sons, Ottawa, owning and controlling the Southam Press, Limited, Montreal and Toronto, as well as a large number of newspapers in various Canadian cities. These are: The Spectator, Hamilton, Ont.; The Citizen, Ottawa, Ont.; The Tribune, Winnipeg, Man.; The Herald, Calgary; The Journal, Edmonton. Mr. Southam is also a director of the Crown Trust Company, Montreal. He is a native of Hamilton and has been largely instrumental in building up the large Southam business interests throughout Canada, from the early beginnings of the Hamilton Spectator. He entered the Southam organization early in his business career.

Fred E. Bronson, the other new director, is president of the Bronson Company, Ottawa, manufacturers of electricity and pulp. He is a director of the Ottawa Light, Heat and Power Company. Mr. Bronson has been connected with the Bronson Company practically all through his business career. He is also connected in an official capacity with a number of logging and booming companies.

PULPWOOD BUSINESS AT STANDSTILL.

The pulpwood business in Quebec, like the lumber trade, is practically at a standstill. Quebec dealers spoken to say they cannot account for the non-demand from the United States, except that the mills in that country are still stocked with wood and paper products. In the meantime the dealers, apart from those who were indebted to the banks, are not worrying: They say they can and will wait until conditions are better and the prices go up again. The French Canadian farmers who for some years past made pulpwood on their farm woodlands, have stopped making. They are doing just as was pointed out some months ago, taking things easy and vow they will cut no more pulpwood until the prices for the article again soar. The French Canadian habitant is an unsophisticated philosopher in his own way and cannot be moved after he has signed up things and come to a conclusion. He made heaps of money during the war that went to pay off all farm mortgages, and is still making money from his farm products, obtaining prices during the European conflict that he never hoped for.

News From Our Advertisers

USEFUL DATA ON DYEING.

The National Aniline & Chemical Co. Inc., has recently issued a very attractive color card, showing a comprehensive range of dyes for paper.

This range includes some fifty-two colors, although one hundred and forty-four complete dyeings are shown. This is probably the most complete color card for paper ever distributed in this country by any dye concern.

The dyeings are shown on bleached sulphite, unbleached sulphite, kraft stock containing 75 per cent ground wood and 25 per cent unbleached sulphite.

On the bleached sulphite twenty-four colors are shown, ranging through the different shades of yellow and orange to the scarlets, blues and violets.

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The colors are classified into three groups,—acid, basic and direct, and the samples shown are clearly marked so as to designate at a glance which group is indicated. Of these groups, the acid colors include a comprehensive range of bright colors of good fastness to light, used chiefly on sized papers; the basic colors possessing great tinctorial power, give more brilliant results, while the direct colors, used principally for the better grades of paper, are particularly adapted to the dyeing of unsized pulp.

NEW FIRM OF CONSULTING ENGINEERS.

Skinner, Sherman & Esselen, Inc. (Hervey J. Skinner, Herbert L. Sherman, Gustavus J. Esselen, Jr.) announce the organization of a firm of chemists and engineers. The new firm has acquired the business and good will of The Boston Bio-Chemical Laboratory and accordingly they are in a position to furnish counsel on all matters relating to the application of chemistry and biology to industrial operations.

Mr. Skinner is well known to the paper industry. For many years he was Vice-President of Arthur D. Little, Inc., and in immediate charge of pulp and paper work. For the past two years he has maintained a consulting office in Boston.

Dr. Esselen is known to the cellulose industry as the Secretary of the Cellulose Section of the American Chemical Society, and for his work on cellulose esters and cellulose acetate silk. The combination of Skinner and Esselen renders the new firm particularly qualified to be of assistance to the cellulose industries.

Mr. Sherman for many years was president of the New England Bureau of Tests and has extended experience in cement and other structural material problems.

The pulp and paper industry is to be congratulated on this new addition to the list of firms who are in a position to be of assistance to them in matters relating both to research and development.

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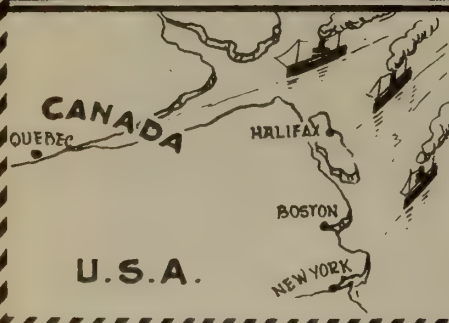
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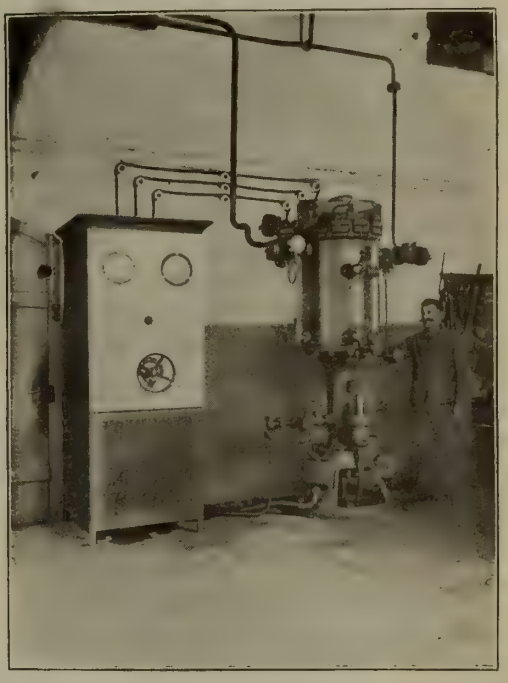
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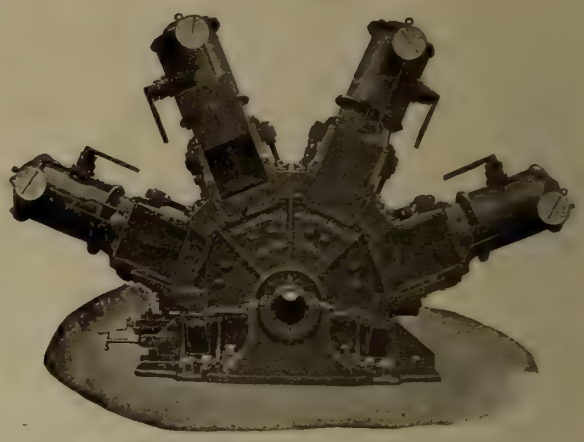
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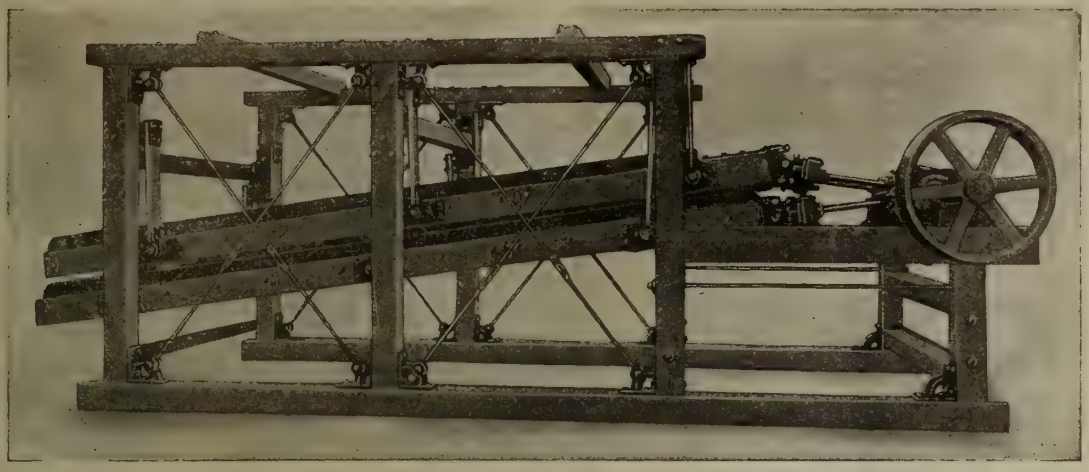
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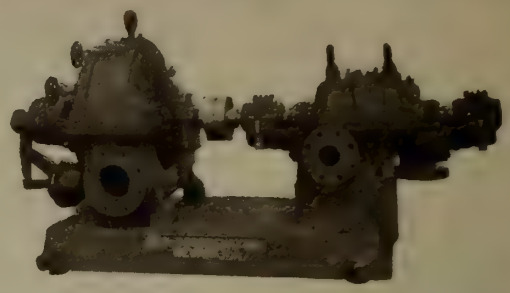
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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., April 21st, 1921. No. 16

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal,
'Phone Uptown 7773.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

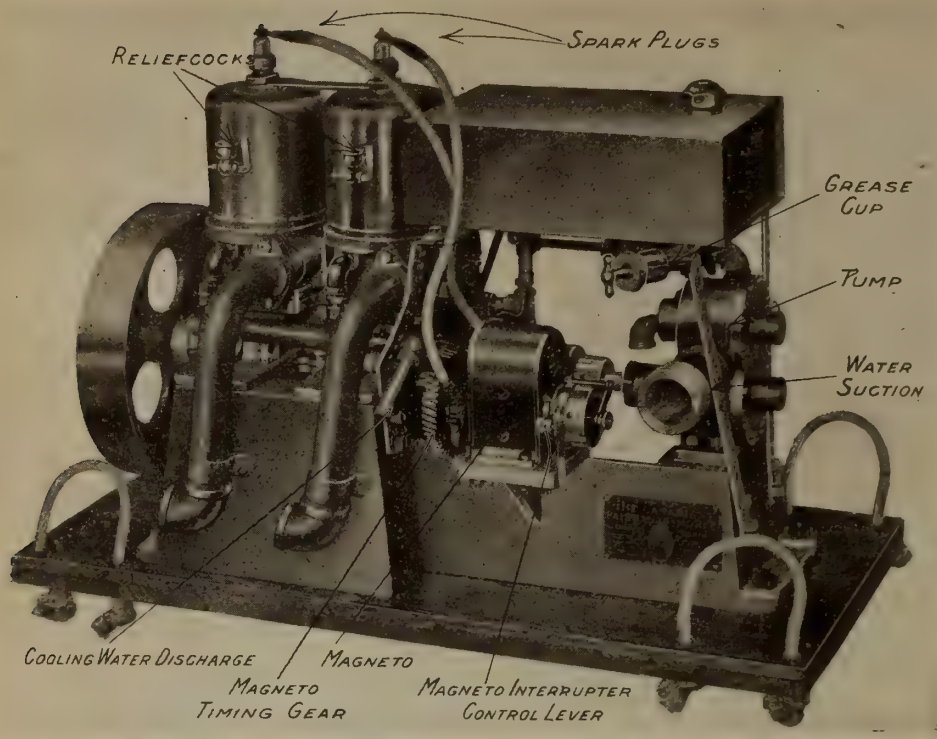
Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

THE TURNING POINT.

It is quite certain that in the forty-four years of its existence, the American Paper and Pulp Association has never held an annual convention during so critical a period in its history as the present time. The feeling seems to be quite general that the industry is now passing through the dullest period that will be experienced. The disturbing uncertainty of the situation is in being unable to determine or predict how long the present dullness will continue. A decidedly cheering note was struck by Mr. Francis H. Sisson in his address at the banquet when he stated that the bankers of the United States are convinced that there is now no danger of a financial panic and that the nation is on a perfectly sound basis as regards general credit and banking ability.

Senator McCormick, while picturing rather dismal conditions in many sections of Europe, intimated a fairly sound political situation. He indicated that the principal difficulty financially, lay in excessive expenditures by greatly impoverished governments. The fact that England has weathered another threatened general strike and the probability of an early settlement of the miners' question shows that the world has taken one more step on the road to the resumption of normal industrial conditions.

The United States and Canada are without doubt in first place as regards the industrial, social and political situations. Both countries have financial and currency systems based on good sound gold money. Individual debts and high priced inventories are being liquidated and with the appearance of new goods made from raw materials purchased at the new low levels, there seems to be every likelihood that the psychological moment will be reached when the public will realize that retail prices have finally reached bottom and with this realization will come the confidence that goods can once more be purchased without fear of comparative loss because of the possibility of still further price reductions. Many commodities have already been marked down to what will doubtless be the price as manufactured from new lots of raw material; in fact there is a feeling that some lines have been reduced to a price which cannot be economically maintained even with the lowest costs of production that seem likely to be attainable in the near future.

The editor has had the opportunity of talking with a number of merchants in several lines, doing business in a country town where there are several mills representing paper, textile and other industries. These merchants maintain that business is, and has been good and that collections are satisfactory. Some goods have been marked down directly 25 per cent. or 30 per cent. and in some cases it seems a bit doubtful whether these goods can be replaced at a cost which will give profit at the price now asked for a similar quality. In fact there are some lines of goods which the wholesaler cannot promise to deliver, his supply and the manufacturer's stocks have been depleted and in some cases where the retailer has postponed ordering fall goods, he will have difficulty in getting them. This to our mind, suggests that people are continuing to buy what they need but are buying only as they need it. This will mean a steady flow of commodities in small streams and there may be some advantage in this condition with the likelihood of a gradually increasing volume rather than to have spasmodic out-bursts with corresponding periods of dullness.

A review of conditions in the paper industry indicates that the lines most seriously affected are not getting any duller although prices in some instances have been somewhat reduced, while several grades of commercial importance are showing a little better condition. The industries on this continent have seen worse times and while there is no use in closing our eyes to the seriousness of the present situation, there is need and reason to take courage and plan carefully for ways to improve the situation and to take advantage of the revival when it comes. Many mills have been girding themselves by improving their machinery, rearranging departments, and installing more efficient equipment and system. With the best labor conditions at present anywhere in the world, with plenty of raw material at hand and with the promise of easier credit for industrial developments in sight, it seems to us that Americans and Canadians have not only more reason for cheerfullness and hope as compared with other countries, but that our prospects for improved industrial conditions are, in general, good.

ON BOTH SIDES OF THE FENCE.

We should think it strange to find a man standing on both sides of a fence unless of course, it happened to be a very low fence, but this is not so strange when we learn that this man *is* Strange. His other name is John and he wrote a letter recently to an American contemporary in which he says "I am more than ever convinced now that there should be an import duty of at least $10 per ton on printing paper, $10 a ton on sulphite, $20 a ton on kraft pulp and paper and corresponding duty on all other kinds of paper, $5 a ton on

groundwood pulp and $2 a cord on all grades of pulpwood." He further states that these estimates are given from the standpoint of the best interests of the people of the United States and that their adoption would result in lower prices to the consumer. He also says that these suggestions are made after a thorough investigation of the available wood supply in the United States and all of the other factors which enter into the manufacture of pulp and paper. In conclusion, the statement is made that the United States should manufacture not only all the paper required by that country, but enough besides to do business with many other countries.

The gentleman from Wisconsin has always been a firm supporter of the Republican party and consequently thoroughly believes in protection of American industries, principally by means of the tariff, and consequently sees in an import duty the only means for encouraging and protecting American's manufactures. In spite of his assertion that a careful study has been made on wood supply and other factors, we are inclined to consider as more reliable, the warnings of such men as Greely, Pinchot, Baker and Kellogg. The recommendations of Mr. Strange, in view of their generally accepted description of the forestry condition in the United States, places him on both sides of the fence. It would be a physical impossibility, according to all authentic reports, for the present stand of timber between the 49th parallel and the Rio Grande to supply the wood using industries of the United States at the present rate of consumption for as many years as Mr. Strange is likely to live. The idea expressed, that it is ignorance or political prejudice which is responsible for what he calls the mistaken policy of building up Canada's pulp and paper industry at the expense of the American, is neither complimentary to Congress nor appreciative of the efforts being made to conserve American forests for the use of American industries. One of the most potent factors in the conservation of American timber is the fact that pulpwood, pulp and paper can be brought into the United States and so relieve the severe burden on the American forests.

Placing a duty such as is suggested, if applied to forest conservation and scientific administration, might be of some advantage; however, where there is not sufficient raw material to produce more than about one third of the wood fibre papers consumed in the United States, such a duty would hardly prevent or even seriously diminish the sale of Canadian paper across the line but might ensure a little more profit to American manufacturers who have their own wood but would make it correspondingly difficult and unfair to the manufacturer who had to import either pulp or pulpwood.

The best point in this Strange letter is the recommendation for a duty of $2 a cord on all grades of pulpwood. The figure is right and the article is right but the duty should be put on the wood north of the line and should go to a fund for replacing, to the credit of the Canadian people, the pulpwood which is going to the mills in the United States. It is perfectly logical and fair that such a step be taken. All of the pulpwood cut from crown lands makes a return to the province in which it is cut and a part of this revenue is used for forest protection. Pulpwood cut on private lands makes almost no return, and that only indirectly, and contributes little or nothing to the protection and production of the timber capital which is depleted by the export of pulpwood. It is the export of this wood from private lands that is the sole salvation of many pulp and paper mills in the United States and the continuance of this supply is about the only hope for the recovery of their forest lands—at least in the eastern states—again to a productive condition. It is not fair that the people of Canada should thus hold the front trenches while their neighbors are re-organizing in the rear. The paradox in such a situation is that the mills thus kept alive and protected will continue to be the competitors of the Canadian mills whose future wood supply is depleted in proportion to the amount of these exports and their future correspondingly jeopardized unless such exports be made to pay for a re-established forest of at least like proportions.

SCHOOL SAFETY WORK.

The old saying "Catch 'em young" applies nowhere with more fullness than with regard to inculcating safety principles in the minds of school children. Boys and girls are then probably at the most reckless age, taking chances and dares either to avoid ridicule or to attract attention is an everyday event with many of them. The impulse to do something is followed by instant action and the thought of possible danger comes only when a serious accident has happened or has been miraculously escaped.

Persons interested in the Safety Movement fully realize the necessity of developing in the children who are to be our future industrial workers, an inclination, at least, to give a little thought to the possible consequences of impulsive action. If even a small proportion of the sad effects of thoughtless acts can be eliminated, safety work will have accomplished much. A number of public schools have grasped the idea and are making good records in the improvement of the attitude of school children in this regard. If young people can be taught properly to avoid automobiles, street cars, fire, objects on stairs and other common sources of accidents in everyday life, they will be careful later on with regard to belts, gearing, overhead cranes and other sources of accidents in the mills. At the Safety Convention to be held in Toronto next Wednesday and Thursday, there will be a special session on School Safety, a matter which cannot be successfully put into operation or bring the best results unless the school authorities get the full support and hearty cooperation both of the children and their parents.

Cost Accounting Fundamentals*

By B. E. HUTCHINSON.

Treasurer American Writing Paper Company and Vice-President of the Cost Association of the Paper Industry.

A great deal of serious work has been done throughout the industry during the past two or three years in the development of cost work. This is a meeting of paper manufacturers, and as such I take it you are interested only in the broadest aspects of accounting and cost work, and more particularly in their application to the conduct of the paper business. The few remarks I make will be based upon such an assumption, bearing particularly in mind that a free and frank discussion among ourselves of some of the issues involved will be of vastly more benefit than any contribution I am personally able to make upon the subject.

Accounting has been defined by someone as the systematic recording of facts. You will observe that according to this definition it is impossible to differentiate between "cost" and so-called "general accounting." As a matter of fact the only distinction between them is of degree and not of kind. General accounting or commercial accounting deals with a business as a unit, as a whole. Cost accounting proceeds a little farther, and analyzes the business by its products. Such analysis may proceed along either one of two directions, and should proceed correlatively along both, viz., an analysis of the operation of the business by departments, and an analysis of the business by products manufactured.

EXHIBIT NO. 1.

COMMERCIAL OR GENERAL ACCOUNTING

Suggested Operating Report.

GROSS SALES TO CUSTOMERS		$0,000,000.00
Less: Freight and Cartage Allowed	$0,000.00	
Returns and Allowances	0,000.00	0,000.00
NET SALES TO CUSTOMERS		0,000,000.00
NET MANUFACTURING COST		0,000,000.00
Gross Profit		0,000,000.00
Packing and Shipping Expense	0,000.00	
Selling Expense	0,000.00	
General Administrative Expense	0,000.00	0,000.00
NET MANUFACTURING PROFIT		0,000,000.00
OTHER INCOME		
Discount on Purchases, Interest on Bank Balances, etc.	0,000.00	
INCOME CHARGES		
Interest on Current Borrowings, Allowance for Bad Debts, Cash Discounts Allowed, etc.	0,000.00	
Net Total		0,000.00
NET OPERATING PROFIT		$0,000,000.00

In application, these two lines of inquiry differ somewhat in their general purpose, although the line of cleavage is far from distinct. An analysis of the operations of a company by departments is of value chiefly in that it furnishes a sound basis for the criticism of the manufacturing costs as well as of the efficiency of the various departments. The accurate knowledge of the labor costs in each department, the pounds of coal per pound of paper, the percentage of broke in each finishing department, and dozens of items of similar character undoubtedly contribute mightily to good management, particularly when they are compared, month by month, item by item, and progress is noted or retrogressions are investigated.

Any attempt on my part to enter into a detailed discussion of either commercial or cost accounting would run us into a very extensive category, and many differences of opinion would be developed. It seems to me, therefore, that progress immediately lies in restricting our discussion within the broadest possible lines and trying to find as many fundamental points of agreement as possible.

Exhibit No. 1 gives in the merest outline an operating statement which is suggested as applicable to the paper industry and as meeting the demand of good accounting practice. The item of Net Manufacturing Cost appearing in Exhibit No. 1 is still further analyzed in Exhibit No. 2 and furnishes the barest skeleton of a cost system. The application of the principles set forth therein to the manufacturing conditions of any particular mill is a highly technical problem, and is strictly within the province of the cost accountant. Both exhibits speak for themselves.

Successful industry is generally predicated upon a sound sales policy, and the management of industry frequently finds its sales problems to be more difficult of solution than the technical problems relating to the control of manufacturing operations. To these problems departmental costs and efficiencies can contribute but little. Here information is required on the relative costs of various products and the relative costs of the same products under varying conditions of raw material markets and labor costs. Neither is it sufficient for the accountant to restrict himself to the customary role of historian of the past, the "recorder of facts," but he must so present his facts that they may be intelligently applied to the consideration of the problems of the future, because the success of an industry depends not upon hindsight, but upon foresight. Our position tomorrow is determined by the sagacity which we apply to the solution of the problems of today, and our experience of yesterday is of value only in so far as it can be made to contribute to the wisdom displayed in laying plans for the future.

We have already observed the importance of sales in the successful conduct of an industry, and whatever may have been the experience of the immediate past, the time has now come when no sale is made without consideration of price as playing an important part in the negotiation. This is a factor upon which cost accounting can throw considerable light. It cannot be denied that, for competing manufacturers individually, the price at which a competitor may be willing to sell

*Presented at the quarterly meeting of the Writing Paper Manufacturers Association in Chicago, January 27, 1921.

plays a vastly more important role than the cost of production at any particular plant; or, put in another way, sales generally must be made at the "market" regardless of cost, and yet upon examination this anomaly is more apparent than real. The so-called "market" is in the last analysis determined by costs. To sell regardless of cost is to invite ruin and court disaster, and when indulged in extensively carries its own remedy. If this fact can be recognized at the beginning, and the conduct of industry regulated accordingly, much bitter experience may be avoided. Cost accounting, practically applied, offers safer and saner council than "cut and try" experience.

Of what is a fair selling price composed? Broadly speaking, its elements divide themselves into two groups—the net manufacturing cost and cost above net manufacturing cost which includes a variety of items. In Exhibit No. 3 an attempt has been made to enumerate these items.

EXHIBIT NO 2

SUGGESTED SCHEDULE OF ITEMS TO BE INCLUDED
IN
MANUFACTURING COSTS

MATERIAL COSTS:

(1) Raw Materials--All fibrous material entering into the production of paper.
To be charged direct to Production.

(2) Process Supplies--All supplies used directly in manufacturing, such as filler, size, color, bleach, etc.
To be charged direct to Production.

(3) Conversion Supplies--All supplies not used directly in the manufacturing of paper, such as felts, wires, coal, lubricants, sundry supplies, etc,
To be charged to Departments

CONVERSION EXPENSE:

(1) Labor--Departmentalized for cost accounting purposes.

(2) Mill Overhead--
(a) Taxes: Other than Federal Excess Profits and Income Tax.
(b) Insurance.
(c) Sundry Manufacturing Overhead: Superintendence, Purchasing, Traffic, Cost, Engineering, Employment Departments, Repair and Maintenance Expense, etc., etc.
All Mill Overhead items to be distributed to departments on some equitable basis.

(3) Depreciation--To be distributed to Departments.
All Conversion Expense to be charged to Production: Departmental Rate method suggested.

TOTAL: Gross Manufacturing Cost.
Less--Broke recovered. Credit to Production Cost and charge to Raw Material Inventory.

RESULT: NET MANUFACTURING COST.

However, the practical application of any generalities such are exhibited here presents a problem of its own and may easily affect materially the solution arrived at. May I take just a moment to comment upon these generalities?

I hope you will not consider me facetious if I remark that raw material is not always found to be worth what has been paid for it. We hear a good deal today about "cost or market, whichever may be lower," but from a manufacturer's standpoint when considering a selling price there is something to be said for "cost or market, whichever may be the higher." Academically speaking, no manufacturer desiring to avoid speculation should be committed for more raw materials than are necessary to clean up his order book, and when the millennium arrives, when customers no longer cancels orders, when unlimited supplies of necessary raw materials are always available for prompt shipment at fair prices, perhaps it may be possible to conduct a manufacturing enterprise without indulging in speculations in raw materials. Perhaps, but not now. In the meantime it is excellent to bear in mind that "one swallow does not make a summer," and that one low quotation does not mean that trading in volume can be accomplished on so favorable a basis. Of course, to the astute belongs "the bacon," and the manufacturer having on hand in a declining raw material the smallest surplus of material will be in an advantageous position to establish lower selling prices without loss to himself. However, as a word of obvious caution, be sure that a selling price is always based upon raw material costs which will bear the strain of volume trading.

With the exception of material cost, upon which we have just commented, I do not believe that there is anything under the caption "Net Manufacturing Cost" which can be considered contentious in making up the selling price estimate. It is largely a matter of fact.

Some considerations can, I believe, profitably be given to the items which must be taken care of in addition to the Net Manufacturing Cost and the principles under which these various items should be applied to the estimating of a selling price of an individual item.

Some may prefer to consider Packing and Shipping Expense an item of manufacturing cost and place it in the first group. There is no particular objection to this under some circumstances, but when a large variety of Packing and Shipping Expense is incurred, such, for instance, as when paper from the same mill is shipped in bundles, rolls, cases for domestic trade, and zinc-lined reinforced cases for export, it would seem desirable to keep this item separate and distinct from manufacturing cost and to consider the expense incurred for these different packings an item of the General Overhead Expense. In making up the selling price estimate for any particular item, however, the actual cost of the packing required would be used in determining the selling price in question and this would apply regardless whether Packing and Shipping Expense be considered as an item of Manufacturing Cost or as an item of General Overhead.

It is suggested that a reserve for Adjustments on Sales (returns and allowances) be set up on a percentage basis.

Cash discounts and Freight and Cartage allowances, if any, can readily be determined for any particular item and it is important only that they receive proper consideration in determining the final selling price.

This leaves for further consideration the items enumerated under "General Overhead"—Profit, Inoperative Contingency and Reserve for Inoperative Departments. The proper application of these expenses in the determination of a selling price per pound or per ream, as the case may be, presents a somewhat complicated problem and several methods of solution present themselves.

Take, for example, the problem of profit. Basically a fair profit is a function of the investment, interpreted in the light of the risk involved in this business. It must not be overlooked, however, that this profit should properly "average out" over a period of years, and in determining the amount of profit to be asked on any one sale, or made in any one month, the instability of this business must be recognized. A study of Mr. Naylor's charts shows that orders are very likely to be either a feast or a famine, and the feast

must furnish the fat to carry us through the winter of famine. The same argument applies to overhead expenses which run on regardless of manufacturing schedules. Of course, these remarks are of interest only to those of us who are so unfortunate as to be short of orders at times, and do not apply to manufacturers who during the last five years have never had occasion to shut down a machine for lack of orders and who feel confident that the same enviable record can be maintained during the next five years. Many of us, however, know by experience that there are contingencies against which it is advisable that reserves be provided, and this provision can be made only by gettng a price which will cover them during those periods in which there is a market for paper. Personally I am persuaded that the several such contingencies enumerated in Exhibit No. 3 are worthy of consideration every time the establishment of a seling price is contemplated.

EXHIBIT NO 3

SUGGESTED SCHEDULE OF ITEMS TO BE INCLUDED IN SELLING PRICE ESTIMATE

NET MANUFACTURING COST

(A) MATERIAL COSTS. To be priced at cost or market, whichever may be the higher

- (1) Raw Materials
- (2) Process Supplies
- (3) Conversion Supplies

(B) CONVERSION EXPENSE. On prevailing or anticipated basis, whichever may be the higher

- (1) Labor
- (2) Mill Overhead
- (3) Depreciation

COST ABOVE NET MANUFACTURING COST

- (1) Packing and Shipping Expense
- (2) Reserve for Adjustments on Sales--Returns and Allowances
- (3) General Overhead Items
  - (a) Selling Expense
  - (b) General Administrative Expense
  - (c) Income Charges--Interest on Borrowed Money, etc etc
- (4) Profit--Interest on Investment
- (5) Inoperative Contingency
- (6) Reserve for Inoperative Departments
- (7) Cash Discount, if any
- (8) Freight and Cartage Allowance, if any

There are at least four principles which may be followed in the establishment of a selling price, though these give no recognition to the method under which Mr. Beckett tells me he successfully managed his business long years ago; namely, to double the price of rags and add two cents a pound for luck. May I enumerate:

First: A manufacturer may blindly follow the "market," and trust that his competitors know more about the cost than he does. It has the merit of vieing in simplicity with the method reported by Mr. Beckett as in vogue long years ago.

Second: A profit of some arbitrary percentage of the cost or selling price may be assumed to yield the desired results, and be applied indiscriminately to all products manufactured.

Third: A profit of some arbitrary number of cents per pound is sometimes advocated as being adequate.

Fourth: Finally, and I trust I have worked up my theme to a climax, a certain amount may be determined as necessary income per machine hour in order to meet these overhead expense items, reserves, contingencies and profit, and the increment above manufacturing cost for any particular item calculated on this basis.

The first of the suggested methods can scarcely be considered worthy of serious discussion. The relative results obtained under the second, third, and fourth methods are shown on Exhibit No. 4 and seem to point conclusively to the superior merit of the machine hour method of estimating selling prices, since it appears to be the only method that assures an equitable profit on all items under the diverse manufacturing conditions met with in the paper mill.

Personally, I cannot but feel that the field of greatest usefulness for the Cost Association lies in the direction of a closer study of the application of cost accounting to the estimating of selling prices. Our friends, the paper merchants, have come to a realization of the benefit to be derived from uniform cost accounting methods. If we, as manufacturers, could decide upon some uniform practice applying to the fundamentals of cost and accounting work, such, for example, as a uniform method of applying our overhead costs in estimating selling prices as illustrated in Exhibit No. 4, we would take a long step towards eliminating unfair and irresponsible competition which at times so seriously impairs the stability of our markets. For the manufacturers who are impressed with the possibilities of progress in this direction the Cost Association of the Paper Industry seems to furnish precisely the medium through which this problem can be most effectively solved, and if the Cost Association can make any substantial contribution to the progress in this direction its existence and continuance will be amply justified.

EXHIBIT NO. 4

COMPARATIVE SELLING PRICE ESTIMATES

Operating Basis: 500 Productive Machine Hours per Month.

	Basis of General Overhead and Profit charged to individual item per		
	Machine Hour $20.00	Mfg. Cost 80% Sales Price	4¢ per Pound
Item No. 1			
Manufacturing Cost	16.00	16.00	16.00
Net Production per Machine Hour	500#	500#	500#
Sales Price	20.00	20.00	20.00
Gross Profit per Month	10,000.00	10,000.00	10,000.00
Item No. 2			
Manufacturing Cost	16.00	16.00	16.00
Net Production per Machine Hour	400#	400#	400#
Sales Price	21.00	20.00	20.00
Gross Profit per Machine Hour	20.00	16.00	16.00
Gross Profit per Month	10,000 00	8,000 00	8,000 00
Item No. 3			
Manufacturing Cost	16.00	16.00	16.00
Net Production per Machine Hour	600#	600#	600#
Sales Price	19 33	20 00	20.00
Gross Profit per Machine Hour	20 00	24 00	24.00
Gross Profit per Month	10,000 00	12,000.00	12,000.00
Item No. 4			
Manufacturing Cost	12.00	12.00	12.00
Net Production per Machine Hour	500#	500#	500#
Sales Price	16.00	15.00	16.00
Gross Profit per Machine Hour	20.00	15.00	20.00
Gross Profit per month	10,000 00	7,500 00	10,000.00
Item No. 5			
Manufacturing Cost	20.00	20.00	20.00
Net Production per Machine Hour	500#	500#	500#
Sales Price	24.00	25.00	24.00
Gross Profit per Machine Hour	20.00	25.00	20.00
Gross Profit per Month	10,000.00	12,500.00	10,000.00

THE AMERICAN PAPER AND PULP ASSOCIATION CONVENTION.

Eleven hundred paper manufacturers, representing twenty branches of the industry, attended the forty-fourth annual convention of the American Paper and Pulp Association, April 11 to 16, at the Waldorf-Astoria Hotel, New York City.

A report, read by the joint committee on Education for the technical branches of American and Canadian associations on the opening day, recommended vocational training for employes in the industry. With the report were submitted two complete volumes of a proposed series of five, prepared to serve in furthering education among workers in the industry. It entailed two years' work at an expenditure of $30,000 by the associations, While three volumes which are well under have yet to be completed, a definite educational programme is being arranged and the association is now prepared to go ahead with it. The report was accompanied by a detailed survey of the industry made to determine the lines of promotion within the industry. As a guide to what higher job workers should be trained in order to win quicker advancement, this survey classifies every type of man and woman employee in a paper mill, the requirements, duties, equipment and line of promotion. It was made by J. G. Wright, assistant director for industrial education of the Federal Board for Vocational Education In this report, Mr. Wright said that men and women should be prevented by education from becoming mere automatic machines. They should be taught to use their mental equipment. The survey reveals that a large number of occupations must be regarded as relatively low in skill. The same survey indicates that opportunities do exist for promotion of the better workers to jobs of greater responsibility.

L. M. Alexander, of Port Edwards, Wis., chairman of the industrial relations committee of the American Paper and Pulp Association, announced that not far from one-half of the manufacturing plants in the paper industry "do not have and never have had any disturbances in their internal industrial relations." When difficulties have arisen, Mr. Alexander says that the fact a plant was being operated as a closed or open shop seems to have made little difference. He is endeavoring to develop a plan which will result in eliminating labor troubles from the paper industry. Mr. Alexander's opinions are based on a survey he has made of labor conditions in paper mills.

The Paper Maker's Advertising Club and the Tissue Paper Manufacturers Association met Tuesday at the Waldorf. At the session of the latter, resolutions were adopted condemning exorbitant charges by retailers of paper products. It was charged that some retailers are asking two cents a sheet for paper that costs them $1 for 500 sheets. The manufacturer has no remedy against these practices, it was said, although he must accept the blame.

Dr. Hugh P. Baker, secretary of the association, made it known for the first time that paper manufacturers were helping to finance the experimental work of the United Forest Products Laboratory at Madison, Wis. An annual saving of $1,000,000, through the prevention of waste due to decay in wood pulp, has been achieved by experiments at the laboratory conducted with the aid of Western paper mills, Dr. Baker reported.

Harrington Emerson, speaking before the salesmen's association of the paper industry in the Waldorf-Astoria Tuesday, termed payment of extra wages for overtime work "one of the most flagrant of all senseless practices". Mr. Emerson was explaining some of the "fundamentals of efficiency". "Either the worker has not yet been working during the normal day," he said, "and has been cheating his employer, or the employer has not supervised him properly, and he is fresh as a daisy at the end of the standard day, or the worker has worked honestly and energetically, and is unfit to continue."

The American Paper and Pulp Association's chief business session was held Thursday at the Waldorf. President George W. Sisson, in his opening address, devoted considerable attention to the interference of Government and politics in industry, the question of relations with Canada as to the importation of pulp wood and the labor situation. The proposed embargo on the export from Canada of pulp wood for American mills is fostered, he said, by persons and interests striving to serve personal ends, and who have little regard for the situation in its broad international aspects. He said the United States is Canada's best market for raw and manufactured products and that if the pulpwood question is taken out of politics and divorced from the influence of selfish promotion interests it could be quickly adjusted by the practical men in the industry. "The Underwood resolution providing for the orderly and amicable discussion of these matters with Canada failed to receive the signature of President Wilson," said Mr. Sisson, "but will be introduced at the present session of Congress, and will, we believe, result in some action. Mr. Sisson denied that the open shop movement was in any sense a conspiracy of employers.

Philip T. Dodge, president of the International Paper Company, made it plain that the employes of the paper mills would have to accept wage reductions, with the alternative of seeing the mills shut down. Mr. Dodge described the paper situation as critical, in view of the shortage of raw materials and the cancellation of orders by many publishers. He said there had been a marked tendency to cut orders in the hope that price reductions would follow. He asserted that the mills had supplies on hand that would run them until the end of May.

United States Senator Medill McCormick was the principal speaker at the annual dinner at the Waldorf-Astoria Thursday night, which was attended by nearly 1,100 members of the association and friends. Senator McCormick painted a gloomy picture of conditions in Europe. Among the principal affections he mentioned the disappearance of silver, the blight of unemployment and the continued new issues of unsecured paper money. He spoke of the improbability that communism would succeed in Western Europe.

Election of officers in the association for the ensuing year resulted in the following selections: President, W. J. Raybold, B. D. Rising Co., Housatonic, Mass.; Vice-Presidents, (Eastern), Henry W. Stokes, York Haven Paper Co., Philadelphia, and (Western) Arthur L. Pratt, King Paper Company, Kalamazoo, Mich.; Executive Committee at Large, Col. W. E. Haskell, International Paper Co., New York; Louis Block, Crown-Willamette Paper Co., San Francisco, and W. R. Shafer, New Haven Pulp Board Co., New Haven, Conn.

Transactions of the Technical Section

INVESTIGATION INTO SPECIAL BRONZES.

(Continued from last issue.)

This article was translated from the Italian for the Committee on Mechanical Standards of the Technical Section. Many readers will find it very technical and perhaps uninteresting. It is published in full in support of the committee's effort to make a really valuable contribution on bronze alloys available to those who make as well as to those who use them. Under this heading, "Thansactions of the Technical Section", the Pulp and Paper Magazine hopes, through committee reports, contributed papers, and discussions, to provide the membership with an open forum for assisting the work of the Technical Section.

Some articles will be kept in type for two weeks after the last installment for correction and discussion and will then be reprinted for distribution to members. —J. N. Stephenson, Chairman, Committee on Publications.

In Table 2 we give the results of the determination of the cooling curves of 26 ternary alloys of copper, tin and lead, whose compositions were selected (as we shall see further on) so as to allow the establishing with sufficient accuracy of the course of the critical surfaces in the portion of the equilibrium diagram of the alloys examined by us.

On the basis of the data contained in the preceding table and represented geometrically in the usual manner (the compositions of the alloy by the interior points of an equilateral triangle; and the temperatures by altitudes proportional thereto, taken on the perpendiculars to the plane of the triangle passing through the points representing the corresponding composition), we constructed the equilibrium diagram of the ternary alloys examined; this diagram is shown in Fig. 2.

This figure naturally shows only part of the complete diagram of the ternary alloys of copper, lead and tin: and especially the part overlying the portion of the base triangle comprised between the two sides corresponding to the binary alloys Cu-Sn and Cu-Pb (sides issuing from the vertex of the triangle corresponding to 100 p.c. copper) and two straight lines the first one of which—parallel to the first side (corresponding to the alloys CuSn)—passes through the point of the second side (of the CuPb alloys) to which corresponds 20 p.c. lead: while the second (parallel to the second side) passes through the point (on the first side) which corresponds to 24 p.c. tin.

From the five superposed critical surfaces, which result from combining the critical point of each of the five series given in our table, it is seen at once that the last three are only horizontal planes at distances from the base corresponding to temperatures of 770 deg., 500 deg. and 319 deg. respectively.

To render possible the referring of the diagram of ternary alloys to the single diagrams of the two series of binary alloys (Cu-Sn and Cu-Pb), we have drawn (in perspective) on the two faces of the dihedral angle (Fig. 2) the portions which interest us in the two diagrams of the binary alloys: on the anterior face the one of the copper-tin alloys (ANZSQROP) with respect to the orthogonal axes AB and VC and limited at the alloys containing less than 30 p.c. tin; on the posterior face the one pertaining to copper-lead alloys (AHILVD) with reference to the orthogonal axes AB and VD and ending at the alloys containing less than 40 p.c. lead.

The surface which in Fig. 2 is bounded by line AEFGH is the locus of the points at which there begins the crystallization of every molten mass whose composition may be represented by a point that falls inside the polygon formed by the orthogonal projection of the above indicated line upon the base of the model. The continuity of this surface, the fact that it connects without deformation with curve AE, along which there separates from the binary alloys of copper and tin the solid solution α (copper-tin)[8], the fact that this surface has approximately the shape of a cylinder generated by lines parallel to AH, passing through the directrix AE; and, still more, the

Table II.

No. of sample	Proportions of metals used (per 100 parts of alloy)		Results of the analyses made at various points of the regulars		I Critical Point beginning	II Critical Point beginning
	Sn	Pb	Position of sample taken	Sn / Pb		
1	4	1	homogeneous composition	4,1 / 0,95	—	—
2	8	1	"	8,1 / 1.12	1015°	—
3	14	1	"	14,1 / 1,15	959°	—
4	4	3	"	3,9 / 3.0	1039°	—
5	8	3	"	7,8 / 3.2	1002°	—
6	14	3	"	13.9 / 3.1	939°	—
7	4	5	"	3,99 / 5.0	1028°	880°
8	8	5	"	8,0 / 5.0	988°	850°
9	11	5	not analyzed	— / —	963°	836°
10	14	5	homogeneous comp.	13.76 / 5.1	928°	822°
11	17	5	not analyzed	— / —	883°	805°
12	20	5	homogeneous comp.	19,8 / 5.0	835°	785°
13	24	5	not analyzed	— / —	—	—
14	4	7	homogeneous comp.	4,0 / 6.9	1012°	880°
15	8	7	"	8,0 / 6.9	978°	862°
16	14	7	"	13, / 7.0	905°	830°
17	4	10	"	2.4 / 10.6	1008°	908°
18	8	10	"	8,0 / 10.4	965°	878°
19	14	10	"	13,85 / 10.4	889°	845°
20	20	10	(top (bottom	20,6) / 7.75) 20,2) / 8.81)	800°	---
21	4	15	(top (bottom	4,1) / 14,13) 4,1) / 15,26) 1	979°	900°
22	9	16	(top (bottom	9,4) / 15,3) 9,1) / 17.18)	920°	887°
23	14	15	(top (bottom	13,9) / 13.09) 13,6) / 15.26)	859°	812°
24	20	8	(top (bottom	21,9) / 6.46) 21.2) / 8,05)	780°	----
25	5	20	not analyzed	-- / --	950°	910°
26	12	20	"	-- / --	868°	----

	III Critical Point (lag)		IV Critical Point (lag)		V Critical Point (lag)		Remarks
	Temp.	duration of lag in minutes	Temp.	duration in minn.	Temp.	duration in min.	
1	---	---	---	----	----	----	No. 1. To compensate for the losses of lead due to volatilization in all the alloys (except the first), we added 1 gram of lead over and above the quantity required for obtaining the desired composition.
2	769°	1'	---	----	----	----	
3	772°	3'	---	----	----	----	
4	---	--	---	----	----	----	
5	---	---	---	----	----	----	
6	765°	3'	500°	very short	----	----	
7	---	--	---	----	----	----	

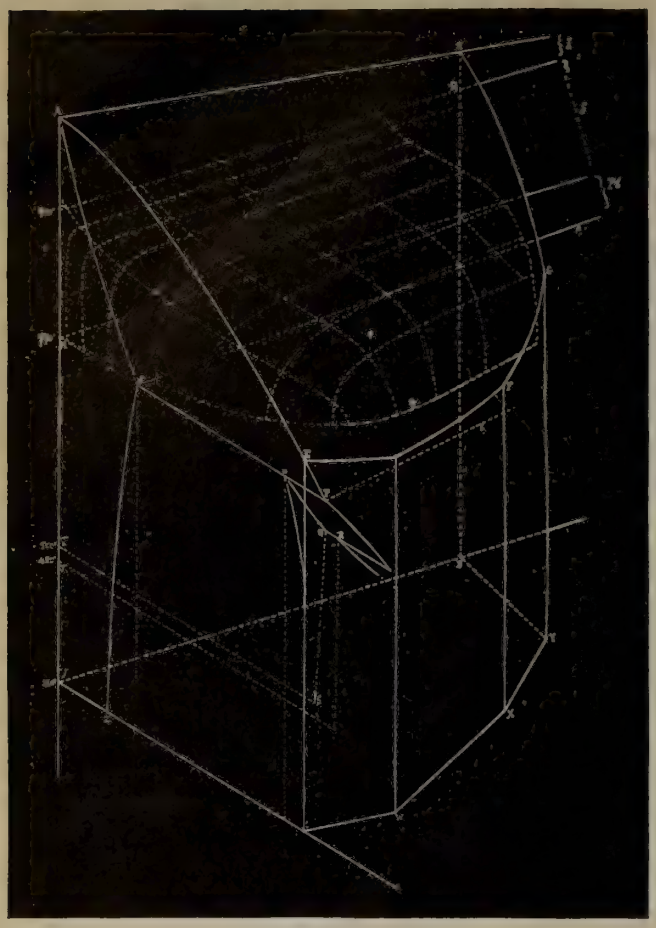


Fig. 2.

microscopic examination of the alloys in question (see further on), prove that the mixed crystals formed along this surface are simply mixed binary crystals of copper and tin, and particularly the crystals designated as "solid solution a" in the series of the constituents of the binary alloys of copper and tin.

The representative point of a given fused alloy (whose composition is comprised within the above indicated limits) moves from the top downwards—during the cooling—at first along a vertical passing through the point in the base which corresponds to the composition of the alloy in question. But when the point has reached the first critical surface (AEFGH) and there begin to separate from the molten mass the mixed crystals of copper and tin (a crystals), the composition of the liquid residue begins to vary and that is exactly in the sense in which the concentration of the tin and lead increases therein. In fact, it is known already that on the one hand the mixed crystals, a, are much poorer in tin than the molten masses with which they are in equilibrium at various temperatures; and, on the other hand, we shall prove in the most evident manner that the mixed crystals themselves which separate from the ternary alloys copper-tin-lead along the surface AEFGH do not contain any lead; so that this metal, too, increases in concentration in the liquid residue simultaneously with the crystallization. This being established, it is obvious that our representative point will have to move on the surface AEFGH along a line which diverges either from line AH or from line AE. We do not have at present any data to establish with accuracy for all cases the course of such a line; but owing to the fact that during the crystallization a little tin solidifies together with the copper (in the state of solid solution) while the entire lead remains in the liquid state, we can prove that our crystallization line will fall entirely within the dihedral angle formed by plane AHIL (of the copper-lead alloys) and the plane passing through the edge AB of the diagram and through the vertical which started the motion of the representative point. If the copper would also separate from the tin, the crystallization line would be nothing else but the intersection of the second plane just defined with surface AEFGH.

The course of the representative point, which is along the first critical surface, corresponds, on the cooling curves, to the interval comprised between the first and second critical point (I and II on Table 2).

The significance of the second critical point, whose values for the alloys of different composition (column II of the table) taken by themselves generate the second critical surface of the diagram (LPO in Fig. 2), cannot be in doubt. It is sufficient to note that the above mentioned surface connects continuously with the straight line LOI of the diagram of the binary lead and copper alloys: whose points correspond to the temperatures at which takes place the separating of the liquid residue into two distinct saturated solutions for each of the alloys containing less than 40 p.c. lead (see above). And in fact as the representative point for binary copper-lead alloys moves along AHI until it meets (in I) the curve which defines the miscibility lacuna of the two metals in the liquid state, so does the representative point of the ternary alloys under consideration move along the surface AEFGH, along the line just mentioned, until it meets the surface enclosing the space in which the miscibility of the three metals in the liquid state is incomplete and from this point onward — which is shown by a bend (second critical point) in the cooling curves — it will continue to move along the intersection of surface AEFGH with the surface of incomplete miscibility[9] while the liquid residue will split up into two layers, segregating a second fused mixture (at the side of the first, whose composition varies along the line of intersection of the two just mentioned surfaces) in proportion as new amounts of mixed binary a crystals continue to crystallize. This at once explains why the second critical points which for the binary copper-lead alloys (points of straight line LOI) appear like breaks in the cooling curves, appear instead like plain bends in the cooling curves of the ternary alloys (points on the surface LOI). In fact, whereas in the binary lead-copper alloys the separation curve of copper (AHI) meets the curve which bounds the region of incomplete miscibility in the liquid state at point I, at which the ulterior separation of the solid copper goes on isothermically pari passu with the formation of the second liquid mixture (corresponding) to point E in the diagram of the binary alloys CuPb (Fig. 1), in the ternary alloys the surface of incipient crystallization intersects the limiting surface of incomplete miscibility in the liquid state along a curve. Hence the second critical points of our ternary alloys do not represent anything but the passage of the representative points of the various alloys from the free motion on surface AEFGH to the motion along the above indicated curve: so that in the cooling curve of the ternary alloys these points would correspond to simple changes of direction ("elbows")

due to the difference between the amount of heat evolved in the plain crystallization of the binary solution α along the surface AEFGH and that evolved when to this crystallization is added the segregation of the second saturated liquid mixture.

The concentration of the tin in the solid solution which separates during the above indicated processes — at first along the surface AEFGH and then along the latter's intersection with the surface of incomplete miscibility — increases gradually with the advancement of the crystallization so that the portions of the α solution which crystallize continuously are in concentration equilibrium with the liquid residue at the crystallization temperature. It is known that the binary alloys of copper and tin interrupt the continuity of this process when the temperature has reached a value of about 770-780 degrees, owing to the fact that the mixed crystals which at this temperature are in concentration equilibrium with the liquid residue are saturated; so that at this point they begin to react with the liquid residue, being transformed into the second β solution, and this last until the liquid residue is exhausted — if the total concentration of the tin was lower than that of the solid β solution (about 22 p.c.) — or until the exhaustion of the mixed α crystals — if this concentration was above 22 p.c. It is clear therefore — and we shall see that the microscopic examination corroborates it fully — that such is the phenomenon that even in our ternary alloys it gives rise to the lag found at 770 deg. C. in the cooling curves. Then the facts that the transformation accomplished at 770 deg. in all our ternary alloys takes place isothermatically ("lag" in cooling) and always occurs at the same temperature (within the limits of experimental errors) for all the alloys comprised in a certain region, independently of their composition, constitutes the most evident proof that the mixed α crystals which separate along the surface AEFGH from the ternary alloys do not contain any lead.

This enables us to find the third critical surface (formed by the points of column 9 in table II and having the shape, at least so far as our studies show, of a horizontal plane) is bounded on one side by the intersection with the plane of the binary copper-tin alloys, and on the other by the intersection with the vertical plane which joins the point N (saturation point of the mixed α crystals in the binary copper-tin alloys) with the vertical bend corresponding to pure lead in the ternary alloys. In fact, it is clear that — since the mixed crystals which separate from the ternary alloys do not contain any lead — their composition at the saturation point is independent of the lead content of the ternary alloy from which they separate, and must therefore be represented in the diagram of these alloys by the points corresponding to a ratio between the concentration of the copper and tin which is constant and equal to that of point N: now these points are exactly on the above indicated horizontal, joining N to the vertex corresponding to pure lead.

This conclusion is completely corroborated by the course of the surface of the duration of the conversion at 770 deg., which can be easily drawn on the basis of the data contained in column 10 of table II. This surface intersects — as is clearly seen in Fig. 3[10] — the horizontal through N exactly along the above defined line issuing from N (line AB in Fig. 3). So

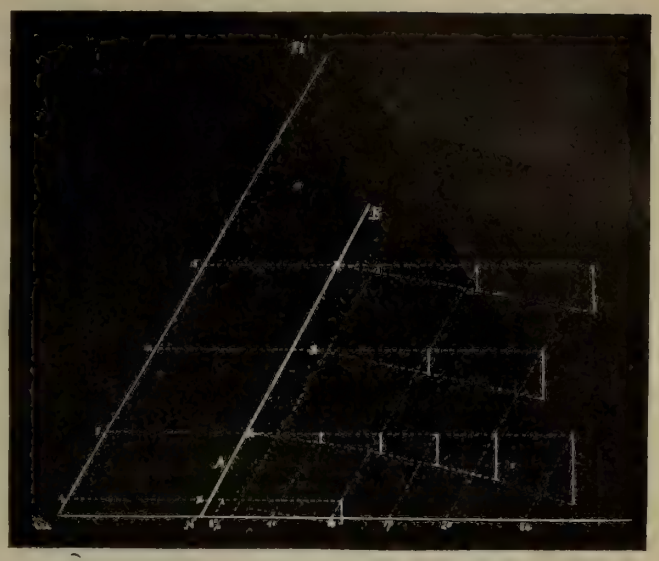


Fig. 3.

that, reversing the reasoning, the latter fact forms the third corroboration of the absence of lead in the mixed α crystals which separate out from the ternary alloys.

This being established and turning our attention to the movement of the representative point of the various alloys during cooling (a movement which we followed up along the surface AEFGH and along the intersection curve — which for brevity's sake we shall call d — of the surface itself with the surface of incomplete miscibility of the three metals in the liquid state), we see that this movement will undergo a lag at the temperature at which the curve drawn from the representative point along the surface of incipient crystallization (AEFGH) will intersect the horizontal surface passing through N: viz. at a temperature of 770 deg. C. This break due, as we have seen, to the isothermic conversion undergone by the binary α crystals at that temperature, reacting with the liquid residue in order to be transformed into mixed crystals of the β series — will naturally take place only in those alloys in which the mixed α crystals which separate out can reach the saturation limit (N); or in those ternary alloys whose composition is represented by points located to the right (looking at the diagram of Fig. 2) of line N A whose position we have defined above. This is fully corroborated by the examination of the numbers in column 9, table II.

Having thus established the significance of the first three critical surfaces of our ternary alloys, let us see what deductions can be drawn from our observations with regard to the shape of these surfaces and their mutual relations. It is easy to recognize at once how the movement of the representative point of the alloys comprised in the field AEFGH during the cooling can take place in two quite different manners according to the initial composition of the alloy examined. We know in fact that the crystallization surface of the solid solution (AEFGH and prolongation) intersects on one side the surface of formation of the solid β solution (horizontal plane through N) along some distance of the curve starting at P, locus of the points analogous to point P itself (we shall indicate this curve by e); and intersects on the other side the surface bounding the field of incomplete miscibility of the three metals in the liquid state along a

curve (which we called d without drawing it in the figure) starting at point I and forming the locus of the points analogous to point I itself. The two curves thus generated intersect in a point which we shall call r (not shown in the figure).

This being established, it is evident that in the movement of the representative point along the surface of incipient crystallization (AEFGH) two distinct cases may arise according as the curve (the course taken by this curve has already been discussed above) along which the point moves intersects one or the other of the two above defined curves (e and d).

In the first case, when the representative point in its movement along the surface AEFGH will have met the intersecting curve of the surface itself with the third critical surface (horizontal plane through N), the mixed α crystals will begin to react with the liquid residue, absorbing its tin to transform itself into mixed β crystals (with a reaction analogous to that taking place at P for binary bronzes), and our representative point will continue its movement (at constant temperature because always on the horizontal plane through N) along curve E starting at P; until it has reached the point (called r above) at which point curve e intersects curve d (starting at I) defined above. The point r is — by its very definition — a quadruple point, at which the representative point stops until the entire completion of the characteristic reactions (already indicated) of the two curves e and d; and particularly of the formation of mixed β crystals from the reaction of the α crystals with the liquid residue by curve e; and of the segregation of the second liquid mixture rich in lead, by curve d. It is therefore evident that the cooling curves of the alloys for belonging to the first case will not show the bend corresponding to the points of the second critical surface (meeting of the crystallization curve with curve d), but a single lag at 770 deg. corresponding at the same time to the movement of the representative point along the isothermal and to its termination point w.

In the second case, on the contrary, there will begin first the segregation of the second liquid mixture rich in lead, beginning from the point at which the curve along which the representative point moves on the surface AEFGH intersects curve (starting at I); then beyond this point — corresponding to the second elbow of the cooling curve — the crystallization (accompanied by the above indicated segregation) will proceed along curve d until at point w (third critical point) there will take place simultaneously isothermatically — as in the first case — the two characteristic reactions of the two curves d and e.

It is quite clear why hitherto we did not possess sufficient data to determine "a priori" which of the ternary alloys belong to the first and which to the second of the cases analyzed by us; and this is because — as we have said already — there are no available data for determining a priori for each of these alloys the course of the curve of crystallization along the first critical surface.

We have, instead, a quite simple experimental criterion for deciding the question. It is sufficient to remark that as we have said earlier that all the alloys for which the crystallization takes place in the same manner show in their cooling curve the bend corresponding to the second critical surface; whereas such a bend does not appear for all those that crystallize according to the first case. Referring to our diagram, the alloys for which the crystallization takes place in the second manner are those whose composition is comprised within the region bounded by the straight line of the binary copper-lead alloys and by the projection upon the base triangle, by the intersection of the second critical surface with the third. The general course of the second critical surface which results from our experimental data enables us to determine to some degree of accuracy[11] its intersection with the third critical surface (horizontal plane through N) for the alloys containing more than 7-8 p.c. lead. Such a course of intersection we have indicated in Fig. 2 by the heavier line θ.

(To be continued.)

ECHOES OF NEWSPRINT CONTROL.

By a Staff Correspondent.

Two echoes of newsprint control were heard in Parliament this last week. In the first place, the report of the Auditor General, which was tabled in Parliament, disclosed the interesting fact that newsprint control cost the people of Canada, during the fiscal year 1919-1920, $48,814·53.

Another interesting phase of the newsprint control suestion emerged, by way of question and answer, in the House of Commons last Thursday. The Hon. W. C. Mackenzie King, the leader of the Opposition, asked the Premier if the Government had received any representations from newspaper publishers on the Pacific Coast as to the difficulty of obtaining newsprint paper, on account of an alleged combine among the paper manufacturers; and, if so, what steps were being taken by the Government to afford the necessary question emerged, by way of question and answer, relief. To this question, the Premier, the Rt. Hon. Arthur Meighen replied that if he remembered correctly, he had received these telegrams from Mr. Cromie, of the Vancouver Sun, complaining that the price sharged him for newsprint paper was too high, but containing nothing to indicate that there was anything in the nature of a combie, although it was indirectly alleged. He added that the telegrams made out no case for an action on the part of the Government.

With regard to this matter, thus ventilated in Parliament, your correspondent was informed, at the office of the Canadian Pulp and Paper Association that the only question involved is a dispute between certain Western manufacturers and the Vancouver Sun. The dispute arises from the fact that the Vancouver Sun has, so far, refused to accept a contract on the same basis as the other Vancouver newspapers, that is to say, on the basis of agreeing to pay $5.50 per cwt. from April to December inclusive. One does not gather that any discrimination against the Vancouver Sun, in the matter of price, is alleged, or that any such allegation, if made, could be sustained.

However, one sometimes doubt whether all newspapers sufficiently realize that the period of newsprint control, with its heavy cost to the people of Canada, has terminated. It would be regrettable if any newspaper concerns were to get into their minds the idea that they are still entitled to preferential treatment in the matter of the price of newsprint or any other commodity.

The funniest sight we saw at the convention was a man smacking his lips after a drink—of water!

British Trade News

(From OUR LONDON CORRESPONDENT.)

London, April 4, 1921.

Serious Coal Miners Strike Dislocates Industry.

We are in the throes of a great strike, all the miners having left the coal mines throughout the United Kingdom and industry is being run on existing stocks. In my notes last week I mentioned that 21 mills, out of 500 paper mills, had adopted electrification and it will be readily seen the effect the present labor crisis in coal mining will have on producers of paper. Fortunately the strike has not occurred at a time when all mills are working at high pressure. That is one consolation; but the export trade has to be considered and present stocks of coal will help to run this section of industry if the railroad men do not join the miners as they have a tendency to do at the moment. The railroad men are having their bonus reduced owing to the cost of living falling, but they say too much is being taken off them—one shilling a week too much, equal to 24 cents—and the companies say "No." If things are not soon patched up the rail men will join the miners, and then things in the country will be at a standstill. The dispute between the coal miners and the owners is roughly as follows:—

(1) The men want a National Settlement; (a) 10 p.c. minimum profits; (b) National profits pool; (c) "War Wage" when prevented from working; (d) District variations according to past percentage additions.

(2) The owners want District Settlement; (a) 17½ p.c. minimum profits; (b) no pool; (c) no such payments; (d) percentages converted into flat rate addition to standard wage.

Both sides agree on (a) Standard Wage; (b) Standard profits; (c) Division of any surplus; (d) Wages based on what the industry will bear.

Who Would Be a British Papermaker?

It is to be hoped Canada will never see, or experience, the troubles a British manufacturer has to go through. The British paper mill owner has a bigger fight for his existence than any other paper mill owner in the world. If he could get on with his own business he would be a happy man: but he cannot, and outside influence wont let him. He is constantly up against some foreign element which is trying to eat into financial resources or hamper him directly and indirectly. Here has been his life since 1914:—

(1) War breaks out. His raw materials are partly cut off and subsequently he loses his labor in the mill. Export trade—dead.

(2) The Controller makes his appearance, with other Controllers.

(3) Between 1918 and 1919 coal and railway strikes and labor troubles.

(4) 1920—Higher Income Tax and Excess Profits Duty, along with other Taxes—not to mention higher assessments.

(5) 1921—Another coal strike, slump in trade, and labor expecting the same high wages as were paid in 1919.

(6) Foreign paper mills underselling the British papermaker in his own market. Result: Attention given to Export trade.

(7) Papermakers told: Drop your old ideas; you must become a Scientific paper maker in 1921.

(8) The old hand-made paper mills in England working full time, with plenty of orders, in 1921—while machine mills are closed, or running short time.

The British papermaker is not "out of the wood" yet and he fully realizes it. It is very fortunate for him that his relations existing today between him and his workers are of the best and it is hoped the present coal crisis will not last long as there are signs of business in paper brightening up a little, if one may judge by the enquiries floating about. To give Canadians an idea of what things are like in the United Kingdom today, taking the miners, unemployment in the paper and textile and other industries, over 3,000,000 workers are idle. Labor is fighting capital, and, of course, where there is unemployment one may rest assured the paper and pulp industries receive a set back.

Paper and Pulp Situation.

We have just got over the Easter holidays and in a way they proved a blessing. They gave mill owners the opportunity of closing down all departments for an extended period, according to the orders they had on hand. Some mills were not reopened for a week or ten days. Many of the mills are now running short time and in cases where heavy stocks are existing substantial reductions are being made to secure a clearance—a policy which is deprecated in some quarters, as it is contended that the present depression in paper cannot go on much longer. Let us hope it cannot as the pulp men want to get busy. The outlook, however, for paper is not cheerful. One must go further afield and look at other industries and see how they stand. Other industries are in the same position as the British paper industry and until they show a revival no revival can be expected in paper or pulp.

A writer in the "Newspaper World"—a weekly paper for Journalists and newspaper men—makes the following comments on Canada:—"Until Canadian pulp mills are in such a position that they can meet all the requirements of our papermaking industry, we shall continue to be at the mercy of Scandinavian and other Continental pulp makers. Nine-tenths of all the paper made in this country is made from imported raw materials, of which by far the greater portion comes from Scandinavia, but Norway and Sweden are both big papermaking, as well as pulpmaking countries, and when it suits their convenience they will sell the manufactured paper at about the same price as they quote for the pulp. For several years past their manufacturers have grown immensely rich by exploiting this and other countries and during 1919 and 1920 the exhorbitant prices they charged for pulp did more than anything else to cause the high selling price of paper with us. Present quotations for pulp are considerably lower than they were and with genuine competition from Canada may go lower."

There is no doubt about the importations of paper and pulp from Canada to the British market upsetting the calculations of Scandinavians. It is always pleasant news to them to hear of the Canadians output of wood pulp going to the States, because they get a free hand in England. British newsprint is selling to-day at 8 cents and Scandinavians are booking orders, along with other Continental mills, at 6 cents. Newspaper proprietors, who get through several tons in a week, naturally go in for the cheap material. They have been crying out against paper prices since the war started and they will not listen to facts.

The most curious element in the whole discussion is that newspaper proprietors are crying out themselves against the increased cost of production. Paper is only one item they complain of and they think the

price to-day should be the same as it was in 1914. They have no conception of the price of pulp or chemicals, and they imagine that pulps should be produced at the same cost as they were in pre-war days. These fallacious ideas drive the British papermaker into a state of disgust because he is being asked to do what the newspaper proprietor cannot do himself and that is to reduce the cost of production.

Another element telling against the papermaker is the high priced contracts he had to enter into for pulps. Scandinavians and papermakers in England are now trying to find a way out of the difficulty. Negotiations are in progress and the pulpmen are doing all in their power to meet the papermakers. Of course with old contracts at high prices, it is impossible to produce newsprint at 5, 6, or 7 cents a lb.

Pulp prices on current business—for the little that is doing—are unchanged.

Protection!

The German Reparation (Recovery) Act has been introduced by the Board of Trade. It is camouflaged Protection. Under section one of the Act those who import German goods pay to the British Customs a prescribed proportion of the value not exceeding 50 p.c. There are other clauses fixing the percentages payable and they may have some effect in stopping the 4 cent and 3½ cent a lb. newsprint that is being dumped into the country from "The Fatherland," where wages are low and the Mark at its lowest point.

London Technical Section.

A paper on "The Stationary Office and the Papermaker" by Mr. E. A. Dawe, of the Stationary Office —a Government Department—was read at the meeting of the London Technical Section of the Papermakers Association the other evening. The paper was merely an informative one for those who send in tenders for contracts to the Stationary Office. After the paper was read Major Marx gave a paper on "A new Tearing Test" and he demonstrated on an Elmendorf Tearing Tester. He reminded his audience that the modern papermaker must be a scientist.

PROGRESS OF THE NORWEGIAN PAPER INDUSTRY.

The rapid development of the paper industry in Norway is described by the Svensk Travaru-Tidning. In 1870 there were only five paper mills in the country; in 1900 there were fourteen, in 1909 twenty-eight, and in 1919 forty. Of the forty mills, five are united with both ground-wood and cellulose plants, eight have their own cellulose mills and six have established ground woodpulp branches. At present Norway has 90 paper machines. Output of paper has increased from 63,881 tons in 1903 to 211,500 tons in 1913. From 1913 to 1916 production rose about 30,000 tons annually. During the war the mills encountered a considerable measure of adversity and manufacture slumped. In the meantime exports have increased in corresponding ratio, since only about 15 per cent of the paper produced is consumed in Norway itself. In 1919 31,306 tons of newsprint were exported, of which 14,389 tons went to England, and 6,552 tons to France. In 1919 exports of thin printings amounted to 9,148 tons, exports of M.G. paper to 4,803 tons, and of woodfree writing and printing papers to 13,697 tons, chiefly to France and England. In 1920 exports have increased, in spite of German competition.—Finsk Pappers Och Industritidskrift, February 28, 1921.—P.B.

MUST CUT WAGES OR CLOSE MILLS.

The management of the Spanish River Pulp & Paper Mills, Ltd., has submitted a proposal through the union officials to all its mill employees in the Sault, Espanola and Sturgeon Falls respecting the renewal of the present agreements between the company and the unions, which expire on May 11, the chief provision of which is a general wage reduction of 30 per cent., which the men have been asked to accept.

The proposal further provides that the present eight-hour day in force among the regular day workers at the mills be increased to nine hours; that Sunday and overtime work, for which time and a half is now granted, be paid for on a straight scale, and that unskilled or common laborers now members of the union work on the open-shop principle, and be paid at rates prevalent in industry elsewhere.

C. H. L. Jones, manager of the Spanish River Mills, said that a readjustment of wages was necessary if the mills were to continue in operation. The present state of the paper-making industry was not so bright as it had been pictured, he stated, and only by a considerable lowering of the costs of production could the mills be kept running on full time and continue to produce paper at the prices prevalent. He said that for some time past the company had been making paper for stock in order to keep the works going even several days a week.

CAN YOU BEAT IT?



Here is a picture of what is claimed to be the biggest load of wood ever hauled by one team in Ontario. On February 19, 1921, Sam Larche at Camp 30 of the Abitibi Power and Paper Co. rode this load 2½ miles, driving his pet team. The picture proves the size of the load, which held 17 cords and weighed more than 33 tons. Note the procession of happy witnesses, also that there is a bit of up grade at this point. If anyone can beat this record send particulars and a picture

In case anyone missed the joke in the last issue, the T.A.P.P.I. was spared from hearing the "remarks" used as an editorial last week—there was only time for the good speakers. Any way, we got it "off our chest."

The Strength of the Riordon Company, Limited

As everybody knows, the Riordon Company, Ltd. is one of the largest concerns of its kind in the world. Its Head Office is in Montreal, and its mills are situated at Hawkesbury, Ont., Merritton, Ont., Temiskaming, Que., Rockland, Ont., Ottawa, Ont., Calumet, Que., and Ticonderoga, N.Y. The Company was established some 63 years ago. For it was in the year 1857 that the late Mr. John Riordon commenced business in Brantford, Ont., as a trader in paper. In 1863 he formed a partnership with his brother, Mr. Charles Riordon, for the purpose of manufacturing wrapping paper at St. Catherines, Ont. The firm's output at the period was one and a half tons a day. That was the day of small things.

In 1867 the firm built at Merritton a mill which, in its day, was considered the finest and best equipped mill on this continent, with a daily capacity of ten tons of news and wrapping paper. A few years later, it started on the manufacture of groundwood pulp, being among the first on this continent to undertake this form of manufacture, newspaper previously having been made from straw and rags. In the year 1885, Mr. John Riordon died and Mr. Charles Riordon became the active head of the business, continuing in that capacity until last month.

In the succeeding year, Mr. Charles Riordon was, with the late Governor Russell, of Massachusetts, instrumental in bringing to this continent the sulphite pulp process, under patents of Dr. Kellner, of Vienna. Therefore the Riordon Company, Ltd., is not only one of the foremost producers, as well as one of the longest producers of pulp in Canada, and, in fact, on the continent, but it is also accorded premier place among the pulp experts of the North America paper trade and its sulphite has become recognized as a standard.

Taking the further operations of the Company in chronological order, the year 1898 saw the building of a sulphite pulp mill at Hawkesbury, Ont., with a capacity of 75 tons daily. To provide the necessary raw material, 600 square miles of the most valuable timber limits in the Province of Quebec, bordering the Rouge River, were purchased.

In 1910, the G. H. Perley Company was merged with the Riordon Company, giving the latter control of the major portion of the timber limits on the Rouge River. With this absorption a modern sawmill at Calumet, P.Q., was also acquired, with a daily capacity of 75,000 feet of lumber. This mill was destroyed by fire in 1911, but was immediately rebuilt in steel and concrete and equipped with the most modern sawing and handling machinery procurable, making possible an increase in the output to 125,000 feet daily.

Since 1913 the mill at Merritton has been completely rebuilt in steel and concrete, which, with the addition of an electrolytic chlorine plant and a bleaching plant, has increased the daily capacity to 40 tons of bleached sulphite. In the same year the Company discontinued to manufacture of paper, confining itself exclusively to manufacture of sulphite pulp of which its combined output now amounted to 250 tons a day.

From this time onward the Company extended and expanded with marvelous rapidity and steadiness. In 1916 it acquired yet another lumber property at Haileybury in Northern Ontario. At this plant the daily capacity is 30,000 feet of lumber and 200 cords of barked pulpwood, the latter being used at the Merritton mill.

Then, in 1918, the Kipawa plant was organized, for the purpose of producing the highest grade of bleached sulphite pulp by utilizing the natural resources of wood, water and power of the north county, and the Company obtained control of vast timber limits within easy reach of the mill, thus ensuing a permanent and adequate supply of pulpwood. The mill is located at the foot of Lake Temiskaming on a branch of the C. P. R. and is distant only 38½ miles from the main line. It should be added that the wood from this district—and there are upwards of 30,000 square miles of timber limits from which supplies can be obtained—is the best on the whole continent for the manufacture of pulp, having a superior fibre and yielding more pulp per cord than any other wood in Canada. The Kipawa plant is designed with the object of producing an ultimate daily output of 500 tons of bleached sulphite pulp. The first unit is in operation at present. The buildings are fireproof, the most modern labor-saving machinery has been installed and the mills so planned as to ensure production of the best bleached sulphite pulp at the lowest possible labor and maintenance cost. The machinery and equipment for this mill were ordered in 1916, when labor and material were much less expensive than they are to-day. Subsequent units will naturally cost much less, as the price of land and water rights for the full 500 tons capacity, are included in the present expenditure. An important factor in connection with this plant is that the water has been tested and found specially suitable for pulp making, and stone, for producing acid, is obtainable from nearby quarries. The company also possesses the advantage of being able to handle all its timber at a low cost from limits to mill, as in every instance this can be done by water routes.

Still the Company went on from strength to strength. Last year, a transaction that will probably always rank as one of the very biggest in the forest industries of Canada took place under which the great holdings and operations of W. C. Edwards & Company, Ltd., and Gilmour & Hughson, Ltd., were united with the holdings and operations of The Riordon Pulp & Paper Company, Ltd., Kipawa Company, Limited, and Ticonderoga Pulp and Paper Company, in a new company, RIORDON COMPANY, LIMITED, the management and control of which remain as in The Riordon Pulp & Paper Co., Ltd. As a result of this combination the Company own, or control by lease, in its own right or through its Subsidiaries, the areas of timber and pulpwood lands tabulated below. The greater portion of these properties are located in Quebec Province on the watersheds of the rivers mentioned, all of which empty into the Ottawa River or its tributaries:—

Watershed	Area Square Miles
Gatineau River	6,290
Quinze River	1,400
Rouge River	1,300
Nation and Blanche Rivers	560
Lower Ottawa River	352
Black and Dumoine Rivers	280
Coulonge River	256
Kipawa River	152
Total	10,590

These immense tracts of timber land—estimated to contain not less than 25,000,000 cords of pulpwood and

(Continued on page 438.)

PULP AND PAPER NEWS

The Rolland Paper Company have recently been making considerable improvements to their mills both at Mont Rolland and at St. Jerome, and both mills are in apple-pie order, the equipment and building of both having been brought as near perfection of efficiency as is possible. At Mont Rolland, which, in particular, is a model mill, a wing has been added in which an increase has been made in the number of beaters and large additions to the machinery, including tub-sizing equipment, have been installed.

Messrs. J. Kobayashi and H. T. Kitamura, Japanese gentlemen, who represent two large pulp and paper concerns in Japan, are making a tour of the United States and Canada, with the object (among other things) of looking into the methods of operation and organization in vogue among pulp and paper manufacturers on this continent. They were in Montreal last week and left there for Grand Mère with the intention of viewing in the Laurentide Company's plant a Canadian plant of magnitude and renown in operation. Messrs. Kobayashi and Kitamura are particularly interested in forestry problems. They state that, while the bulk of the pulp used in Japan is imported, there is yet a certain amount of spruce grown in that country. A certain amount of Japanese paper is also made from bamboo. These gentlemen intimate that it is the intention of pulp and paper concerns in Japan to take a hand in stimulating the growth of spruce. It is interesting to learn that the machinery used in the Japanese mills is very modern and up-to-date English and American pulp and paper machinery. The Japanese market at present is largely confined to that country and China, but certain grades of paper are exported. People who met these two Japanese representatives were greatly impressed with their command of the English language which they spoke with fluency and precision.

Mr. George Chahoon, Jr., was in Montreal last week as was Mr. George M. McKee.

Officials of the Riordon Company were emphatic in their denials last Saturday morning of the statements contained in an Ottawa news despatch of Friday night to the effect that the company was laying off 2,500 men at its Kipawa mills because of over-production and unsatisfactory conditions prevailing in the manufactured pulp industry. The shutting down of the Kipawa plant was admitted, but it was stated that this was of a temporary nature and one within the normal practice which has to provide for repairs and general overhauling of machinery. The number of men affected by the temporary closing of the plant, it was stated, was probably about 250, and not 2,500 as stated in the Ottawa despatch. Furthermore, it was said, manufactured stocks of sulphite pulp on hand were nothing like the ridiculous quantity referred to in the telegraphed reports, which valued these at some $5,000,000, or well up to a year's production at the mill.

The tenders for the groundwood mill to be erected by Mr. J. H. Dansereau at Sorel are in, but the contract will not be let until about the first of May. The mill in question will be of 40 ton capacity. The question of also going ahead with a paper mill is under consideration.

At the big Convention in New York, last week, the pretty general opinion among the pulp and paper men seemed to be that, while a good time might be expected in the fall, there was little ground for expectation of immediate returns. However, it was felt that there was no ground for any undue pessimism. The fact was fully appreciated that as between Canada and the United States, on the one hand, and Europe, on the other, the pulp and paper industry on this continent is, relatively speaking, in a favorable situation, in Great Britain today, many of the mills are closed up tight. They are over-loaded with expensive pulp. Not only so, but they are forced to compete, in their own market, with Scandinavia, whence they bought the expensive pulp with which they are over-loaded. On the other hand, Canadian mills are working fifty per cent of the "peak" of last year, which was the record year in the history of the pulp and paper industry. That the industry in the United States and Canada had a good deal to be thankful for, in comparison with conditions in Europe, was a view that was more and more borne in upon the Convention as discussion proceeded. At the end, the very general feeling seemed to be that the crisis had passed, and that, all things considered, it had been a far from protracted one.

With regard to the question of prices, certain sales managers incline to the view that while, in a general way, the market is a falling one, the two declines that have recently taken place were of so substantial a nature as to be likely to render any further immediate decline improbable. It is of interest to note that prices of certain grades of paper in Canada are about ten per cent lower than prices of the same grades in the United States — and this altogether irrespective of duties, etc.

One rather outstanding feature of the present situation is the way in which the book paper market has stood up. This is, possibly, largely due to the large issuance of catalogs and to the extensive use of book paper for advertising in journals. The advertising situation in Canada and the United States differs very materially from that in Great Britain, In the two former countries, it is advertising which forms the bulk of the publishing business. In Great Britain, on the other hand, it is very rare for the advertisements carried in a paper to represent fifty per cent of the whole paper's contents. Mostly it runs to forty per cent or less — and often considerably less.

The Toronto Paper Mfg. Company's mill on the Cornwall Canal and the Provincial Paper Company's mill at Mille Roches have been closed down for a few days, owing to some repairs that are being made to the canal.

George Carruthers and T. Linsey Crossley of Toronto were in New York last week attending a

meeting of the joint text book committee held in connection with the annual meeting of the American Pulp and Paper Association. George Winlow, of the Canada Paper Company, was also a Toronto representative at the association meeting.

A. G. Pounsford, of the Port Arthur Division of the Provincial Paper Mills, spent a few days of last week in Toronto visiting the head office.

L. P. Bouvier, of Bouvier and Hutchison, envelope manufacturers, Lombard St., Toronto, who has been spending a holiday in the Bahamas Islands, along with Mrs. Bouvier, has returned to Toronto after a very enjoyable vacation.

The Strathroy Age, owned by G. D. Evans, has purchased the Strathroy Despatch owned by Richardson Brothers, thus eliminating one of the weekly papers in the Western Ontario town. The paper will now be published under the name of the Age-Dispatch.

The annual meeting of the Canadian Daily Newspaper Association has been called for Toronto on May 3rd, next.

Mr. Smith, of Smith, Davidson and Wright, wholesale stationers, Vancouver, B. C., has been spending some days in Toronto on business.

The Canadian Pulp and Paper Association is sending out a series of well prepared circulars to the trade designed to stimulate greater interest in the use of Canadian-made papers. The last circular sent out points out that last year Canadians imported considerably over a billion dollars worth of goods. Over 68 per cent of these imports came from the United States — and were paid for with Canadian dollars on which the exchange averaged from 10 to as much as 17¼ per cent. In other words, for every dollar's worth of United States goods, Canadians paid and are paying from $1.10 to $1.17¼ in addition to the duty. The circular calls on the printers of Canada to aid in getting the Canadian dollar back to its true worth by consistently supporting Canadian paper industries.

Already, as a result of the passing of Premier Drury's amendment to the Public Enquiries Act in the Ontario Legislature last week, the machinery has been set in motion for a resumption of hearings of the Timber Commission. When Government counsel has arranged with the commissioners for the first of the new sessions, steps will be taken to have stayed or permanently dismissed the injunction proceedings of the Spanish River Pulp and Paper Mills Company, which temporarily halted the probe, but which has been legislated out of court by the Ontario Government.

Mr. John Lewis, a former editorial man of the Toronto Globe, has rejoined the staff of that paper after a year spent as editor of Liberal Publications in connection with the National Liberal Committee at Ottawa.

A provincial charter has been granted to Empire Publications, Limited, with a capital stock of $750,000, and headquarters in Toronto. The company is empowered print and deal in books and other publications. The Dominion Publishing Company, Limited, is another new organization to receive a charter with power to engage in a general printing and publishing business. Among the promoters of the company is L. Murray Ray, of Toronto.

The Strathcona Paper Company, manufacturers of building papers and light board, Strathcona, Ont., reports that business in the sheathing line, which has been dull most of the winter, is beginning to pick up again. The company expects to start up their machine on sheathing papers almost immediately and are installing a new board machine which will be running by May 1st.

Spruce Falls Co., Limited, have not yet started work on the proposed groundwood pulp mill at Kapuskasing, Ont., and action will be deferred for the time being. The sulphite pulp mill of the company, with a maximum capacity of 120 tons, is steadily moving towards completion.

Over 30,000 cords of pulp wood from the Pembroke, Ont., district have been shipped across the line, while from the Gatineau and Perth districts a like amount has gone over to Uncle Sam. The 60,000 cords, together with the shipments to Canadian points, represents an expenditure of approximately $1,000,000 in the districts named, while Pembroke's share, counting spruce shipments to the Booth mill at Ottawa, is easily half a milion dollars. The average price paid per cord was $14 and it is estimated that this figure shows a profit to the producer of fully fifty per cent. It is stated that, owing to the thinning out method employed in reaping the harvest, in another five year's time another crop will be available.

The death took place in Toronto, a few days ago, of John H. Shaw, secretary treasurer of the Wilson-Munroe Company. Deceased, who was well known in the wholesale paper business, was a man of sterling character and possessed a wide circle of friends and business associates, who will mourn his loss. The late Mr. Shaw was born in Wentworth County in 1872, coming to Toronto 16 years ago where his executive ability attained for him a prominent position in the commercial life of the city.

A spark from a yard engine at the Thorold, Ont., plant of the Beaverboard Company, started a fire in a large pile of pulp and scrap paper a few days ago, but was extinguished before any of the buildings were damaged.

A new record in the erection of a paper machine has just been made with the completion of the new No. 5 machine of the Abitibi Power and Paper Company's plant at Iroquois Falls. James C. Simmons, of the Pusey-Jones, completed the installation in 28 days, working days of nine hours. The machine is 160 inch and will be electrically driven.

WHALEN DOING WELL.

Toronto, Ont., April 18.—Satisfactory conditions in connection with the operations of the Whalen Pulp and Paper Mills are reported by President T. W. McGarry, who has just returned from visiting the company's properties in British Columbia.

All three pulp mils are operating at full capacity under contracts made last fall, the larger portion of the sulphite produced being shipped to Japan. The output is close to 5,000 tons of sulphite per month. The company's two saw mills are operating to a capacity of 250,000 feet per day, and one of the two shingle mills is operating.

Contracts for sulphite will keep the pulp plants running for some time yet. The Whalen mills being located on tidewater, have an average over most Canadian pulp and paper plants, being largely independent of the high railway rates.

Technical Section

REVIEW OF RECENT SITUATION.

A-15; E-0. Digestion of Wood, etc., with the Aid of Chlorine. Ger. patent No. 323,936, A. FRANZ, Sept. 18, 1919. **J. Soc. Chem. Ind.**, xxxix, 745A (Nov. 30, 1920). The chlorine is used dissolved in an indifferent solvent such as carbon tetachloride. After extraction of the product with a 2 per cent aqueous sodium hydroxide solution, pure cellulose is obtained.—A.P.-C.

C-0 Wood Preservative. Br. Patent No. 148,137 (not yet accepted). F. BUB, Petershagen, near Berlin, Oct. 13, 1920. **Chem. Met. Eng.**, xxiii, 1229 (Dec. 22, 1920). Mercuric chloride solution is rendered more effective as a wood preservative by mixing with it a solution of fluorine salt such as sodium fluoride, a fluosilicate or a mixture of fluorine compounds with fluosilicates. The specification states that the mercuric chloride is converted into complex salts. The salt solutions may be applied separately to the wood.—A.P.-C.

E-0; F-0. Process for Treating Cellulose-containing Materials. Br. patent No. 147,232, ZELLSTOFFFABRIK WALDHOF, Mannheim, Germany, Sept. 29, 1920. **Chem. Met. Eng.**, xxiii, 1181, (Dec. 15, 1920). To avoid the deleterious effects of acids, alkalis, and salts on cellulose fibers and also on the by-products resins, tannin, carbohydrates, etc., due to the high temperatures obtained in the ordinary methods of treating wood and other cellulose-containing materials under pressure, the pressure is produced externally and independently of the temperature used, by forcing or pumping air or other gas or suitable liquids, such as that used for treating wood, into the apparatus in which the material is being treated. Fifty atmospheres pressure or more may be used. The apparatus may be first exhausted, and alternate vacuum and pressure may be applied to reagents used for other purposes such as saccharification.—A.P.-C.

E-2; K-10. Sizing of Paper by Sulphite Waste Liquor. Ger. patent No. 323,627, E. RASCH, May 31, 1916. **J. Soc. Chem. Ind.**, xxxix, 745A (Nov. 30, 1920). Concentrated waste liquors are used without removal of the bases present, and if necessary with the addition of further bases. If the calcium compounds present in the liquors are decomposed and the lime removed, the adhesive properties are impaired.—A.P.-C.

E-2. Method of Using Sulphite Waste Liquor. U.S. patent No. 1,329,300, H. H. HURT, assignor to Robeson Process Company, Jan. 27, 1920. **J. Soc. Chem. Ind.**, xxxix, 741A (Nov. 30, 1920). Finely-divided fuel is wetted down with concentrated sulphite waste liquor and charged on to a fire bed.—A.P.-C.

E-2. Decolorization of Waste Liquors. Ger. patent No. 324,787, A. WIPFLER, April 1, 1919. **J. Soc. Chem. Ind.**, xxxix, 779A (Dec. 15, 1920). Waste liquors from the manufacture of pulp are treated with metals or their compounds (stannous chloride, metallic chromium, and hydrochloric acid, chromic acid with aluminium bisulphate) capable of forming insoluble color-lakes with the coloring matter.—A.P.-C.

E-2. Paper Sizing from Mitscherlich Waste Liquor. Ger. patent No. 323,865, A. MICHL, Jan. 16, 1919. **J. Soc. Chem. Ind.**, xxxix, 779A (Dec. 15, 1920). Waste liquor from the Mitscherlich process is exposed to the air for a short time, and then centrifuged, a concentrated emulsion of the resinous constituents of any required density being thus obtained. The sizing material is fixed by means of alum.—A.P.-C.

E-2. Obtaining Fats from Sulphite Waste Liquor. Br. patent No. 146,430, W. Jeroch and Reichsausschuss für Pflanzliche und Tierische Oele und Fette Ges., Berlin, Sept. 15, 1920. **Chem. Met. Eng.**, xxiii, 1133 (Dec. 8, 1920). The sugar content of sulphite waste liquor is converted into fat by growing a fungus **Endomycea vernalis** on the liquor. The liquor is first treated—for example by aeration and neutralization—and is then inoculated with the fungus whose early growth may be assisted by adding nitrogenous substances such as beet juice to the waste liquor, or by first growng the fungus in a culture medium rich in nitrogen and then transferring it to the liquor. The first stage of the process is marked by a large absorption of nitrogen and by rapid growth of the fungus. During the second stage the sugar in the liquor is assimilated and converted into fat, and the growth of the fungus is slight. The masses of fungi are finally removed from the solution and treated for the recovery of fat.—A.P.-C.

F-0. Manufacture of Hemicellulose from Wood by the Soda Process. Ger. patent No. 324,053, T. and E. KITTELSEN, March 4, 1919. **J. Soc. Chem. Ind.**, xxxix,779A (Dec. 15, 1920). Wood is reduced to small fragments and boiled with clarified "black liquor." It is then washed, ground, and subjected to further treatment.—A.P.-C.

F-2. Tannins from Black Liquor. Br. patent No. 145,742, H. BRUER, Bonn-on-Rhine, Sept. 1, 1920. **Chem. Met. Eng.**, xxiii, 1037 (Nov. 24, 1920). Hides and skins are stated to be tanned by the application of constituents extracted from vegetable substances such as wood, straw and the like by means of alkaline liquids; or by formaldehyde or the salts of heavy metals such as chromium and iron, in the presence of such constituents. In an example, an extract obtained by boiling straw in soda-lye is mixed with iron-alum, in which case a yellow deposit is slowly brought down. This suspended agent is used for tanning. — A.P.-C.

F-5. Method of Producing Cellulose Fiber. U.S. patent No. 1,354,731, J. A. DeCEW, Oct. 5, 1920. **J. Soc. Chem. Ind.**, xxxix, (Nov. 30, 1920). Lignocellulose is impregnated with a solution containing 15 per cent of caustic soda under the usual conditions of temperature and pressure of pulp cooking. Excess of alkali is then removed so that the lignone is attacked only by the alkali absorbed.—A.P.-C.

F-5. Production of Soda Pulp from Vegetable Materials of all Kinds. Ger. patent No. 323,743, M. MULLER, Aug. 21, 1919. **J. Soc. Chem. Ind.**, xxxix, 745A (Nov. 30, 1920). Digestion is effected by means of soda or sulphate solutions to which alkali or alkaline-earth salts of lower fatty acids have been added or in which such salts have been formed by addition of lower fatty acids. Crude calcium acetate which contains calcium phenolate has a very favorable influence, and the addition of tar oils assists digestion.—A.P.-C.

F-5. Production of Pure Soda Pulps by Double Diges-

tion with Alkalis and Acids. Ger. patent No. 523,744, M. MULLER, Aug. 21, 1919. **J. Soc. Chem. Ind.**, xxxix, 745A (Nov. 30, 1920). Soda pulp produced by known methods of alkaline or neutral digestion is further treated with mixtures of inorganic and organic acids or their salts. The mother liquors from this second treatment contain precipitable substances which can be used for loading and sizing paper, etc.—A.P.-C.

K-6. Process of Obtaining Cellulose from Straw, etc., in Two Stages. Ger. patent No. 324,894, C. S. FUSCHS, May 2, 1918. **J. Soc. Chem. Ind.**, xxxix, 779A (Dec. 15, 1920). Vegetable matter, especially straw, is boiled with alkaline lyes at the ordinary or increased pressure, until a solution rich in lignic acids is obtained, and the boiling process is then completed with fresh lye. The acid precipitated from the first solution can be used as a resin substitute, etc.—A.P.-C.

K-23. Manufacture of Dense Strong Paper. Ger. patent No. 323,745, C. G. SCHWALBE, Feb. 21, 1918 (addition to 303,498). **J. Soc. Chem. Ind.**, xxxix, 779A (Dec. 15, 1920). Paper stock, or cellulose waste, is treated with acid, after which it is subjected to mechanical treatment in edge runner mills or disintegrators, and the gummy material so obtained is added to paper pulp.—A.P.-C.

K-23. Manufacture of Waterproof Paper. Ger. patent No. 323,816, H. WANDROWSKY, June 15, 1919, **J. Soc. Chem. Ind.**, xxxix, 779A (Dec. 15, 1920). Cellulose esters, insoluble in water, are added to paper pulp, and the paper, after drying, is treated with a soluble solvent for gelatinizing the cellulose esters. In the case of paper textiles, the solvent is not added till after the weaving process.—A.P.-C.

L-0. Saccharifying Cellulose. Br. Patent No. 146,455, A. WOHL, Danzig, Sept. 15, 1920. **Chem. Met. Eng.**, xxiii, 1133 (Dec. 8, 1920). Soluble carbohydrates obtained from materials containing cellulose by treatment with concentrated sulphuric or hydrochloric acid, are, after lixiviation in a counter-current, separated from the conversion acids by a process similar to the "molasses osmose" process. Sufficient acid is allowed to remain with the carbohydrates for complete hydrolysis during subsequent heating, or the acid may be removed as fully as possible, and the solution neutralized, evaporated to dryness and used as a fodder.—A.P.-C.

L-0. Linoleum. Br. patent No. 146,367. Phenoleum Ges., Berlin, Sept. 15, 1920. **Chem. Met. Eng.**, xxiii, 1037 (Nov. 24, 1920). A composition for making linoleum consists of cellulose treated with alkaline lyes and vapor of carbon disulphide, a rubber-like product obtained by heating glue or carbohydrates with glycerin and saponified resin. These ingredients are mixed, heated, treated with hardening agents, etc., kneaded and rolled up with cork meal, sawdust or other finely powdered cellulose and coloring matter. The mass can be applied to a backing of paper or not, as desired.—A.P.-C.

L-5. Cellulose Esters. Br. patent No. 146,092, Société Chimique des Usines du Rhône, Paris, Sept. 8, 1920. **Chem. Met. Eng.**, xxiii, 1132 ((Dec. 8, 1920). For the manufacture of cellulose esters of fatty acids, a cellulose is employed which has been preliminarily treated at a temperature not exceeding 30° Cent., with small quantities of acetic anhydride in presence of a catalyst diluted with glacial acetic acid. Thus, 100 parts of cellulose are treated with 50 parts of acetic anhydride, 3 to 5 parts of sulphuric acid, and 60 parts of glacial acetic acid at a temperature of 25 to 30° Cent., for 3 to 4 hours; 250 parts of acetic anhydride are then added and the mixture maintained at 40° Cent. for 1 to 2 hours to effect esterification. The esters may be separated by precipitation with water, or they may be converted by partial saponification into esters having different solubilities; the precipitated esters are insoluble in chloroform whereas some of the saponified esters are insoluble in chloroform and soluble in acetone and others soluble in ethyl acetate.—A.P.-C.

L-5. Spanish Moss as Source of Cellulose. U.S. patent No. 1,327,873, M. W. MARSDEN, Jan. 13, 1920. **J. Soc. Chem. Ind.**, xxxix, 744-A (Nov. 30, 1920). The material is boiled with dilute sulphuric acid, and the liquid is separated and used for production of sugar, alcohol, etc. The cellular residue is suitable for conversion into nitro cellulose, artificial silk, etc.; or after boiling with a solution of coap and glycerin, washing and drying, may be used as a filling for mattresses, etc.—A.P.-C.

L-5. Process for the Manufacture of Cellulose Acetates. U.S. patent No. 1,330,543, H. A. LEVEY, Feb. 10, 1920. **J. Soc. Chem. Ind.**, xxxix, 744-5A (Nov. 30, 1920). Cellulose is treated with chlorinated acetic acid; i.e., glacial acetic acid which has been treated with chlorine until it is distinctly yellow, and when disintegrated the excess acid is expressed and the mass dissolved in a mixture of acetic acid and zinc chloride at 55 to 70° Cent. and further treated with chlorinated acetic acid for 12 to 36 hours at 50 to 70° Cent. The product is then washed and dried at 60 to 75° Cent. It is soluble in ethyl acetate, ethyl butyrate, and pyridine, and insoluble in benzin, carbon tetra-chloride. and alcohol.—A.P.-C.

L-5. New Derivatives of Cellulose. Fr. patent No. 496,526, P. E. Ch. GOISSEUET, France, Aug. 6, 1919. **Chimie & Industrie,** iv, 668 (Nov., 1920). Three parts of phenylisocyanate is made to react with one part of cellulose in the presence of tertiary bases (pyridine) and yields a phenylcarbamic ester of cellulose. Phenylisocyanate can be replaced by an aliphatic or another aromatic isocyanate. These new cellulose esters can be put to the same uses as the other cellulose esters.—A.P.-C.

L-5. Cellulose Esters. Br. patent No. 149,320 (not yet accepted), L. LILIENFELD, Vienna, Nov. 3, 1920. **Chem. Met. Eng.**, xxiii, 1269-70 (Dec. 29, 1920). The more highly alkylated ethyl, methyl, benzyl and other alkyl esters of carbohydrates of the general formula $(C_6H_{10}O_5)$, such as cellulose, starch, dextrin, lignin, and inulin, are prepared from the lower alkylated esters of further alkylation in the absence of water or in the presence of only moderate amount of water. For the further aklylation a large excess of alkali is not required, and a quantity calculated on the amount of alkylating agent present is sufficient; an excess of alkali may, however, be employed, in which case the amount of alkylating agent is less than that necessary when considerable amounts of water are present. The products obtained are distinguished by their resistance to cold water and by their solubility in a large number of volatile solvents. By-products such as alcohols, ethers, etc., may be distilled off during or after the alkylation, or may be recovered from the alkylating mixture either by steam distillation or by extraction with suitable solvents. In an example the preparation of an ethyl ester of cellulose is described in which a viscose or an alkali- or hydro-cellulose and diethyl sulphate are the primary reacting materials.—A.P.-C.

UNITED STATES NOTES

A proposal of paper mill owners calling for a 30 per cent wage reduction and an increase in the working day from eight to nine hours met with a flat rejection on the part of union representatives of paper and pulp mill workers at the conference held recently at the Murray Hill Hotel, New York. Preparations are now under way to submit the action of the representatives by a referendum to the rank and file of the various unions in the United States and Canada for their approval or rejection, with the understanding that in case satisfactory agreements are not made between now and the time of the expiration of the present agreements, work will automatically cease in the mills of the company's involved. The unions represented at the conference, besides the two principal organizations of paper mill workers, of which J. T. Carey and John P. Burke, are presidents, were the International Brotherhood of Stationary Firemen, International Association of Machinists, Brotherhood of Electrical Workers and the engineers. These unions have formed a federation for joint action in the present dispute in order that all the workers in the different crafts may act together.

The Cotton Manufacturing Company, Montgomery, Ala., announce completion of plans to establish a pulp manufacturing plant in that city for the manufacture of pulp from cotton linters. Initial cost of the plant will be $100,000. Expansion in the utilization of waste cotton fibre and linters for paper is encouraged by the demand for paper, and location of the plant at Montgomery will assure an adequate supply of the raw products. The daily capacity will be about 200 bales of linters.

The International Paper Company is taking bids for the erection of its proposed hydroelectric power plant at Cadyville, N.Y. About $250,000 will be spent on the project. A. H. White, New York City, is architect and engineer.

A bill providing for the development of New York State's water power by private interests under State supervision was passed by the upper house of the Legislature at Albany last Thursday. Governor Miller is certain to sign the measure which is based on recommendations made in one of his messages to the legislators.

A tabulation of reports from 1,000 manufacturers received by the New York State Department of Labor shows that employment during March in the State's Factories increased somewhat over the preceding month. Depression continues, however, in the metal, paper and printing industries. Included in the several lines that showed notable reductions in employment during March, paper manufacture showed a falling off of 9 per cent.

The Robert Gair Company of Brooklyn, manufacturers of paper cartons and containers, have taken a lease on three floors in the new Borden Building, Madison Ave. and Forty-fifth street, New York, to house the large clerical force. The quarters of this division of the concern's staff at 50 Washington Street, Brooklyn, have been so cramped up that removal to new offices has been under consideration for some time past.

Henry Vettel of Cornell University has won a traveling scholarship for $1,000 for study in the forestry department of a Swedish university. He goes as one of a party of twenty American students all of whom have been appointed to scholarships for courses in the universities and technical schools of Denmark, Norway and Sweden during the school year 1921-22. The selections of these students were made by the American Scandinavian Foundation under the terms of a fellowship exchange between the United States and Scandinavian countries which provides for twenty Scandinavian students at American universities. One other student besides Mr. Vettel will study forestry.

Although the report of the International Paper Company shows record earnings for last year, equivalent to $52.07 a share on the common stock, against $13.24 a share the preceding year, there is very little likelihood of the company beginning dividends on the common shares during the current year. President Dodge, in his statement to the stockholders, says that there is absolute necessity for speedily acquiring additional woodlands, purchasing outside wood for the time being, and cutting it in a conservative manner. He says that this cannot be accomplished without the investment of a great amount of additional capital, probably hard to obtain on reasonable terms at the present time. Consequently current earnings or profits of the company shall be largely invested for a considerable period in wood protection. It is the sincere effort of the management, according to Mr. Dodge, to prevent the recurrence of unwise dividend payments of past years and so strengthen the company that all dividends once established may be maintained.

Richard E. Thibaut, who was known as one of the leading wall paper manufacturers of the United States, died suddenly a week ago on his country estate, Fairfield, N.Y. Mr. Thibaut was born in Milford, Pa., fifty-eight years ago. He was brought to New York when a boy and educated in the public schools there. At the age of twenty he had established himself in a business of his own—a wall paper house, that finally developed into the present firm, Richard E. Thibaut, Inc.

Camp Fires, Railroads and Brush Burning Responsible.

Much of the destruction caused by forest conflagrations is attributed in figures compiled by the United States Forest Service to carelessness on the part of campers. The statistics which cite the origin of fires of various sorts in the country's forests during the last five years, show that 12½ per cent of the damage resulting from such blazes may be traced to camper's fires. These are fires that have not been properly wetted down or stamped out. Lightning is shown to have been responsible for nearly 10 per cent, railroads about 15 per cent, and brush burning nearly 14 per cent. The total area burned from all causes during the last five years would exceed that of the combined States of Delaware, Rhode Island, Connecticut, Massachusetts, New Hampshire, Vermont, New Jersey, Maryland and West Virginia.

BOOK REVIEWS.

Technical Methods of Analysis.

The Committee on Bibliography of the Technical Association, Clarence J. West, chairman, desires to direct the attention of members of the association to a recent valuable book of analytical methods edited by Roger C. Griffin which is entitled **Technical Methods of Analysis as Employed in the Laboratories of Arthur D. Little, Inc., Cambridge, Mass.**

This book which is published by McGraw-Hill Book Company, New York, contains a representative selection of the analytical methods that have been adopted as standard procedures in a large commercial laboratory engaged in technical analysis.

With few exceptions the methods described in **Technical Methods of Analysis** have been used many times in the laboratory and have been proved to give satisfactory results in the hands of different analysists. No attempt has been made to give the experimental data to show the accuracy of the method nor to enter into the theory of the procedure. On the other hand in many cases it has seemed advisable to give brief descriptions of the properties which a given material should normally possess and sufficient other information to enable the analyst to translate his results into practical language. Certain specifications and requirements of an authoritative nature have also been included.

An idea of the scope of the book may be gained from the Table of Contents, which includes, Reagents, General Inorganic Analysis, General Organic Analysis, Analysis of Metals, Analysis of Fuels, Analysis of Paints and Paint Materials, Analysis of Oils, Fats, Waxes and Soaps, Analysis of Wood, Paper and Papermaking Chemicals, Analysis of Textiles and Textile Fabrics, Analysis of Foodstuffs, Miscellaneous Analyses.

Members of T.A.P.P.I. and others will be especially interested in Chapter VIII, Analysis of Wood, Paper and Papermaking Chemicals, though there will be much of interest in the other chapters. This chapter contains the following methods of analysis: Cellulose in wood, Woodpulp sampling and testing, Sulphate cook liquor, Sulphite acid, Alum, Aniline dyes, Blanc fixe, Bleach (bleaching powder), Bleach consumption of pulp, Casein, Clay for paper filler, Crown filler, Glue, Lime, Limestone, Rosin, Rosin size, Satin white, Talc for paper filler, Ultramarine, Fibers in papers, Standard papers for fiber analysis, Chemical analysis of paper, Physical testing of paper, Sizing in paper, Tarnishing test for paper, Cotton cellulose (cotton linters) for nitration, Wood distillation products. Three plates, showing the appearance of variously sized paper are included as well as certain paper testing apparatus, taken from Mr. F. C. Clark's Report.

The chapter contains all the methods needed in the routine testing of paper, and covers much the same ground as that transversed by Sutermeister in his chapters on testing. The one advantage of the book is that the methods have been used over a period of years and are known to give results.

The U. S. Bureau of Mines notes a steady decrease in the volatibility of motor gasoline—another straw pointing to the use of sulphite alcohol.

THE EFFECT OF AGE ON THE BURSTING STRENGTH OF CORRUGATED FIBRE BOARD.

By J. D. MALCOLMSON.
Millon Institute, Pittspurg, Pa.

The effect of age on ordinary papers has been fairly well established by a number of careful investigations extending over long periods of time. This has never been done n ithe case of fibre containers, however, owing to the comparatively recent development of this industry.

During this development, there has been considerable speculation as to whether age would have different effects on this material than on ordinary papers. Such a difference might reasonably be expected because of the use of various chemicals such as silicate of soda and those used in the sizing. In addition, container board, and especially corrugated board, is made up of a variety of fibrous substances, such as straw, waste papers, kraft pulp, etc., any of which might have some effect on the future strength of the board.

This Laboratory recently had occasion to re-test some seventy different samples of corrugated boards which were secured in 1916. Most of these boards were made in 1915 and 1916, although some dated back to 1910. At the time these samples were obtained, over four years ago, they were carefully tested with the Mullen Tester, ten punctures being made in each board to secure an average. The original samples and data were all preserved, and the tests repeated in 1920, using, in each case, the same manipulation, namely, a wheel speed of 120 R. P. M. and the so-called "constant level clamp."

The results of these two series of tests are shown on the accompanying table. They indicate,

1. That the average of seventy-one samples showed a decrease in Mullen test of only one per cent in four years.
2. That chemicals, such as silicate of soda and sizing, had no noticeable effect on the final strength of the boards.
3. That deterioration is roughly proportional to the amount of ground wood present, which has also been found true in the case of ordinary papers.
4. That boards containing a large amount of new kraft or sulphite fibres very often show an actual increase in strength. Thus it will be noticed that nearly every sample made by "Mftr. No. 5" increased in strength. These particular boards all contained a large percentage of new chemical wood fibres.

Some of the results of microscopical analyses are entered on the table opposite such samples as showed a marked change in strength. Those containing a large proportion of ground wood suffered most and became extremely brittle. The kraft liners, on the other hand, showed no loss in bending value.

It was noticed that very few of the boards showed the "washboard effect" when wetted. Where this occurs, it is probably due to the silicate of soda "striking through" the board, saponifying the rosin sizing. This usually indicates an inefficient application of either adhesive or of sizing, since many corrugated boards but a few weeks old will show this effect when wetted. In other words, this investigation also tends to show that silicate of soda, properly applied, has no ill effects on the waterproofing of corrugated fibre boards.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, April 16. — With business very quiet in pulp and paper circles and with comparatively little turn-over, a number of the mills, notably the newsprint mills, are contemplating a reduction in wages to the employees. It is known that such an action is under consideration at the present time, due to the altered business conditions, and if decisions are reached along this line, they will likely take effect May 1st or thereabouts. Just what the reductions will amount to is not known, but it is variously estimated that the cuts will represent from fifteen to thirty per cent in some of the newsprint mills, while book and writing paper mills may effect a reduction of ten per cent. No definite decision has been arrived at yet, but it is common knowledge that the mills are seriously considering a downward revision of the wage scale and that May 1st will see a radical change. Most of the pulp and paper mills at the present time are running short time and very few of them are running any where near capacity, while in some instances complete shut-downs have been necessary. Newsprint demands are being lessened to some extent by the elimination of some of the weekly papers. An instance of this is the absorption of the Toronto World by the Toronto Mail and Empire which went into effect last week, the Mail and Empire having bought the World from the liquidators of the latter paper. The process of absorption is going on in a number of the smaller places also, Strathroy, Ont., having merged its two weekly papers during the past few days.

Employing printers are holding back in their orders owing, to some extent, to unsetttled condition of the trade precipitated by the demand of the printers for a 44-hour week and increased pay, with its threatened possibility of a strike. These are adverse conditions that are seriously affecting the paper trade, and although they are likely to be of a temporary character, they have had an upsetting effect. The industry, as a whole, however, is in a healthy condition and the spirit of optimism is strong among manufacturers and wholesalers. Expansion plants are only temporarily halted and some of them will be proceeded with, while others will be held pending a return to normal conditions, which it is confidently expected will be before many more months have elapsed. It is understood that there is a possibility that the new mill at Port Arthur, of the Provincial Paper Mills Company, Limited, will be gone on with at a date not far distant. The plans have been prepared and are being studied, but as yet the company has made no announcement as to when work is likely to start.

Clarke Bros. have opened their new fibre case plant at Glen Falls, N.B.., which will be used exclusively for the manufacture of corrugated fibre boxes to be made of high grade kraft pulp, while annual statements of such companies as the Maurice Paper Company and other like concerns, not only indicate a satisfactory growth of the paper industry, but show that these companies are strong financially. There are many signs that the pulp and paper industry is sound at the roots and that the present lull in business is but a prelude to still greater development and expansion as soon as the temporary dull period expires.

PULP. — Very little pulp of any grade is moving and the mills report a small demand. Although no transactions of importance are taking place, some sales are being made at prices around $130 for bleached and $100 for natural, with ground wood at $45, although these figures are only an index of what the mills are getting. When it comes down to a deal these prices are likely to be shaved a bit and there is usually considerable negotiation before a figure is arrived at and the shipment sent out.

TISSUES AND TOILETS. — The market in these lines is very much curtailed and none of the mills are running at capacity. What demand there is is confined to small orders which bulk fairly large at the end of the month, but there are no large orders going in any line and the prices remain unchanged. A feature of the trade last week was the putting on the market by the Interlake Tissue Mills, Limited, Merriton, Ont., of a new line of interfolded paper towels, which the company have not hitherto made. They are also supplying the cabinets as well.

KRAFT.—There has been a distinct improvement in the kraft market during the past couple of weeks and the mills report freer orders, with the price remaining at ten cents per pound. One mill reports that already this month they have booked a bigger tonnage than during the whole of last month and that there are evidences of a restoration of confidence in the trade.

WRAPPING PAPERS AND BAGS. — The feature of the wrapping paper and paper bag trade during the past week has been a further decrease in bags, which took a drop of ten per cent. The prevailing discounts on paper bags under the new schedule are as follows: manila 55 p.c., 10 and 5: kraft 65 and 5: white, 45, 10 and 5. There is no change in the wrapping paper situation and business remains dull.

BOOK PAPERS, BONDS AND LEDGERS. — A canvas of the job houses in Toronto indicates that stocks in the above lines are becoming somewhat depleted, although there is no great tendency on the part of the jobbers to re-stock. One jobber who wanted some 25x35-40 book paper says that he tried practically all of the jobbing houses in the city and was unable to procure it. There has been some revival of business in books, bonds and ledgers, one jobber estimating an increase of fifteen per cent in out-going stuff during the past month over any one month since the dull period set in which is taken as an indication that paper users are gradually getting back into the market. Jobbers are not looking for any further reductions in prices for at least two months.

BOARDS. — There is very little demand for boards and printers blanks and box boards and practically no market as to price. Jobbers and other dealers report that they are virtually able to go to the mill and make their own price on any line they want to buy, although they are putting very little in stock.

It is further stated that quite a number of American travellers have been in Canadian territory of late, but their visits have been more of a social character as far as doing business in any paper line is concerned and practically no orders are being placed.

NEW YORK MARKETS.

New York, April 16 — (Special Correspondence.) — This has been "paper week" in New York, when paper manufacturers and merchants from various parts of the country have been gathered together to attend the annual conventions of the American Paper and Pulp Association and the National Trade Association, and the result has been that business has been quieter than previously. With mill executives away from their desks and with paper jobbers and distributors absent from their offices, it is but natural that trade activity has slowed up somewhat; this is a usual occurrence during convention week. The market as a whole has undergone no important changes. Demand has not broadened, excepting possibly in some out-of-the-way cases, and it is still plainly apparent that buyers are operating on a very reserved scale, confining purchases to supplies needed for immediate use.

Reports brought to New York by visiting paper manufacturers and jobbers show conclusively that business throughout the country is slow. Producers of paper and board say that their plants are running at no more than 50 per cent of capacity on an average, and jobbers that consumers the country over are buying solely to fill current requirements, which, at best, are considerable below what they ordinarily are. It is gratifying to be able to say that a concensus of views among the paper men attending the meetings in this city this week is that the sooner prices get down to a level where they will remain for a time, the sooner will demand for paper and paper products increase. It is also gratifying to be able to say that most of those present at the conventions were heartily in favor of a reduction in paper prices to a point where buyers can be induced to take hold and absorb larger amounts of paper. Statistics cited at the various meetings during the week showed that present prices are substantially below the high levels reached last year and yet indicated that further sharp declines will necessarily have to occur before prices are on levels comparing favorably with those existing prior to the war.

A prominent paper manufacturer stated in an address that in spite of the extremely high prices prevailing in 1920 on fine papers that his concern operated on a profit basis of only 7 per cent. This is proof positive that high paper prices have been the result of high raw material and labor costs, and it stands to reason that prices on the finished product cannot be brought down until the cost of manufacturing is reduced. Raw materials have receded in recent months until in some instances they are down to actual pre-war levels; the great difficulty now therefore rests with labor.

That paper manufacturers intend to carry out their program of getting prices on their product down to more reasonable levels by reducing the cost of production can be seen in the plans of newsprint manufacturers to cut wages 30 per cent and increase the working day from eight to nine hours. Obviously, the union of paper mill workers is opposing this move, and present indications are that it is quite probable a strike will be declared by newsprint mill workers, to become effective May 11. A strike vote is scheduled to be taken on Sunday, April 17, following which conferences between the union leaders and manufacturers will be resumed.

The newsprint market rules exceedingly dull. Spot demand is negligible and contract buyers are not beginning to use their normal tonnage of print paper. Quotations are very irregular, and, in fact, mean little today, because buyers invariably can secure supplies at less than the prices named. So-called distress lots of newsprint are being constantly placed on the market to sell for whatever publishers will pay, and sales of roll news at 4 cents per pound are not uncommon. Contract quotations are maintained but mills are booking few new orders. Instead, some publishers are cancelling contracts.

Book papers continue to recede in price. Machine-finished book in job lots is offered in New York by mill agents at 7 cents per pound and less, while supercalendered book is available at 7½ cents and coated and enamel book at as low as 9½ cents for some grades. The printing trade is decidedly dull and this is reflected in a light demand for book papers. Wrappings and tissues are moving in fairly steady fashion though in limited volume. Demand for some kinds of tissue, principally toilet paper, towels and napkins, is gradually improving, and it is stated that mills producing these papers are running probably at a larger capacity than any other class of paper mills. Fine tissues, however, are in little call, and No. I white is quoted at 90 cents to $1 per ream.

Fine papers are just about holding their own in point of market activity. Demand shows little or no expansion, yet matters have not become any worse. Prices on bonds and ledgers are very irregular and it is difficult to ascertain what constitutes an average basis of values. It is stated that mills in the New England district mostly have sizable stocks and that they are making deliveries principally from stock.

Demand for boards continues narrow. Consumers are purchasing in hand-to-mouth style and are not absorbing anywhere near normal amounts of board. Quotations on plain chip range between $30 and $35 per ton at mills, and on filled news board at from $32.50 to $37.50.

GROUND WOOD. — Mechanical wood pulp is moving only in small tonnage and at prices close to the low edge of quotational ranges. Buyers show scant interest in offerings at above $30 per ton f.o.b. grinding plants and seem to be filling present requirements through purchases at around this basis. Grinding mills are operating at materially reduced capacity but still appear to experience difficulty in marketing their output, and were it not for the contract business transpiring, it could be said that trade is virtually at a standstill. Board manufacturers are almost entirely out of the market and there is little demand from newsprint mills. The situation clearly reflects the dulless prevailing in the paper market and it is unlikely to improve until business in the finished product increases.

CHEMICAL PULP. — Aside from occasional sales of small lots of different grades, there is nothing in the form of business stirring in chemical wood pulp. Dealers and importers are managing now and then to dispose of a limited-sized quantity of pulp to some consuming mill needing it for immediate use, but buy-

ing is solely of such character, and involves an unimportant total volume of pulp. The trend of prices continue downward. There is no established basis of value on any grade, and it is plain to be seen that sellers are more often obliged to grant concessions from the prices asked to move stock. News grade sulphite is quoted at about $70 a ton at pulp mills and yet the great bulk of this kind of sulphite moving brings no more than $60. Domestic easy bleaching sulphite is quoted at about 4.50 cents per pound at producing mills, domestic No. 1 bleached sulphite at 6 to 6.50 cents and domestic No. 1 kraft at 3.75 cents, while buyers invariably are securing wanted supplies at cheaper figures.

RAGS.—Paper manufacturers display very little buying interest in rag stock. Offerings by dealers mostly elicit the reply that mills are not desirous of buying, having present needs covered and not being willing to anticipate forward requirements. The naming of low prices attracts few buyers; consumers are pursuing a policy of refusing to absorb supplies regardless of how cheaply they can buy. As a result, it is hard to say what market levels are. Dealers ask one price and then turn around and sell at a cent or two per pound less when afforded an opportunity to rid themselves of a part of their holdings. Even roofing rags are moving lower in price. Sales of No. 1 roofing at 75 cents per cwt. at shipping points have been reported, whereas only a short while ago these rags were fetching $1 per hundred. Repacked No. 1 whites are freely offered to mills at 6 to 7 cents a pound, depending on the packing; repacked thirds and blues at 2.50 cents, and miscellaneous No. 1 white rags at 5 cents. Practically no sales of new cuttings have been recorded and prices on such rags are strictly nominal.

PAPER STOCK.—As one trader describes it, the waste paper market "is shot to pieces." Demand from consuming quarters is of negligible character and the small amounts of goods moving toward mills do not even skim the supply that is available. The prices prevailing on most grades are at levels where packers and collectors have stopped operations because of the loss they suffer in producing stock to sell at the figures obtainable. Old No. 1 mixed paper is offered at 25 cents per cwt. f.o.b. shipping points and folded newspapers at 40 cents without attracting buyers for the reason that board mills are not in want of supplies and therefore refuse to take material in. Sales of hard white shavings of No. 1 quality to mills at 3 cents a pound at shipping points and No. 1 soft white shavings at 2 cents have been reported, with the probabilities favoring buyers getting some lots at still further reduction in price. Old books and magazines are available at 85 cents per hundred pounds, old kraft paper at 1.40 cents and white blank news cuttings at 1.50 cents, while ledger stock is offered at 1.65 cents and old No. 1 manilas at 75 cents.

OLD ROPE AND BAGGING.—Old rope holds up in price at between 3.75 and 4 cents a pound at shipping points for No. 1 manila rope. There is also a moderate call for mixed strings at around 85 cents per cwt. Bagging is neglected by buyers and can be bought at almost any figure within reason which is offered. Offers of No. 1 scrap bagging at $1 per cwt. result in few sales as mills are not disposed to buy while not in immediate need of fresh supplies.

THE STRENGTH OF RIORDON CO., LTD.

(Continued from page 429.)

over 12,000,000 feet of pine, besides very large quantities of merchantable and easily accessible cedar, poplar and various hardwoods—constitute the largest area of pine and pulpwood holdings under one control in the world. And the ownership of over 6,000 square miles of timber limits in one block, adjacent and tributary to the Gatineau river, which empties into the Ottawa river a few miles from the city of Ottawa, places the Company in possession of one of the largest supplies of timber and pulpwood on one watershed in the world.

Among its other interests, the Company owns a controlling interest in the Ticonderoga Pulp and Paper Company, of Ticonderoga, N.Y., which makes the finest book paper on the continent, and which also operates a soda pulp mill with a yearly production of 11,000 tons.

Further, the Company owns, or controls by lease, either in its own right or through its subsidiaries, extensive water powers, of almost inestimable value, with 11,000 horse power at present, but with a total ultimate capacity of 175,500 horse power. These water powers, and the respective capacity of development of each are as follows:—

Watershed	Capacity of Development H.P.
Quinze River	45,000
Gatineau River	45,000
Kipawa River	40,000
Rouge River	25,000
Nation River	7,500
Lievre River	5,000
Welland Canal	5,000
Rideau River	3,000
Total	175,500

The watersheds of the Kipawa, Quinze, Rouge and Gatineau Rivers, have a combined area of approximately 34,000 square miles. A large portion of this area is the surface of lakes and rivers. These provide enormous natural storage areas for the eventual development, as the Company may require it, of an immense additional amount of electrical power. The Gatineau power is within six miles of the City of Ottawa, which City at the moment is suffering from a shortage of hydro-electric power. The development of this water power to such an extent as may afford a surplus of power over and above the Company's own requirements is contemplated so that revenue may be derived from the sale of surplus power in Ottawa.

As regards pulp and paper production, the total is 153,000 tons a year of which the various plants of the Company and its subsidiaries contribute as follows:

	Tons Per Annum
Kipawa Mill, Bleached Sulphite Pulp	42,000
Merritton Mill, Bleached Sulphite Pulp	9,000
Hawkesbury Mill, Bleached Sulphite Pulp	40,000
Hawkesbury Mill, Easy Bleaching Sulphite Pulp	8,000
Ticonderoga Mill, Soda Pulp	11,000
Ticonderoga Mill, Book Paper	18,000
Present Production	128,000
Addition to Kipawa Mill	25,000
Total Production Pulp and Paper.	153,000

Lumber production attains a total of 125,000,000 board feet a year made up as follows:



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	Board Ft. Per Annum
Gilmour & Hughson Mill, Ottawa....	25,000,000
W. C. Edwards & Co. Mills, Ottawa and Rockland	80,000,000
Riordon Mills, Calumet	20,000,000
Total Lumber Production	125,000,000

It should be added that the Gilmour and Hughson and Edwards mills produce mostly fine and spruce lumber, while the Riordon mills at Calumet produce spruce and hardwood lumber.

Physical assets of the kind that have been briefly summarized above give some idea, although, by reason of their very magnitude, it is difficult for the mind fully to grasp their size and significance, of the material strength of the Riordon Company, Ltd. Further, it is but the literal truth to say that, whether in building construction, in machinery, in technical skill and equipment or what not, it plays a pioneer part in efficiency and up-to-dateness of method. With a consistency that has known no deviation, it has addressed itself to the improvement alike of its plants and of its methods of scientific control. The result is—and informed opinion is pretty generally unanimous on the point—that in the lines that it has made especially its own, that is to say, the manufacture of book and magazine papers, writing paper and paper for office use, its products are second to none of these kinds in the world.

GOOD ON BOTH ROADS.

One of the practical advantages of co-ordination of Canadian National and Grand Trunk lines of railway, is shown by a recent order which enables the use of mileage books issued by one road on the trains of the other company if desired.

Previously, if a business man were travelling, from Toronto to Ottawa for example, his Canadian National "book" would be valid to that point. But if he wished to continue his journey to Montreal over the Grand Trunk, it would not have been good on the G.T.R. train.

The order just issued wipes out the distinction, in a mileage-book sense, between C.N.R. and G.T.R. Books issued by the Grand Trunk are good over all eastern lines of the Canadian National and, likewise, those issued by the C.N.R. are valid on the trains of the G.T.R. One capital outlay takes the place of two which should be a matter of satisfaction to the travelling public.

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News From Our Advertisers

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There are few men better known to the pulp and paper industry than William (Billy) Whyte, who has been for several years the popular representative of Canadian Fairbanks-Morse, Ltd. Besides his wide selling experience, Mr. Whyte has been a successful mill manager.. He is now an independent agent, representing manufacturers of paper and pulp mill supplies, including felts made by Ayers, Ltd., and fourdrinier and cylinder wires made by Niagara Wire Weaving Co. and Lindsay Wire Weaving Co. We wish him all success.

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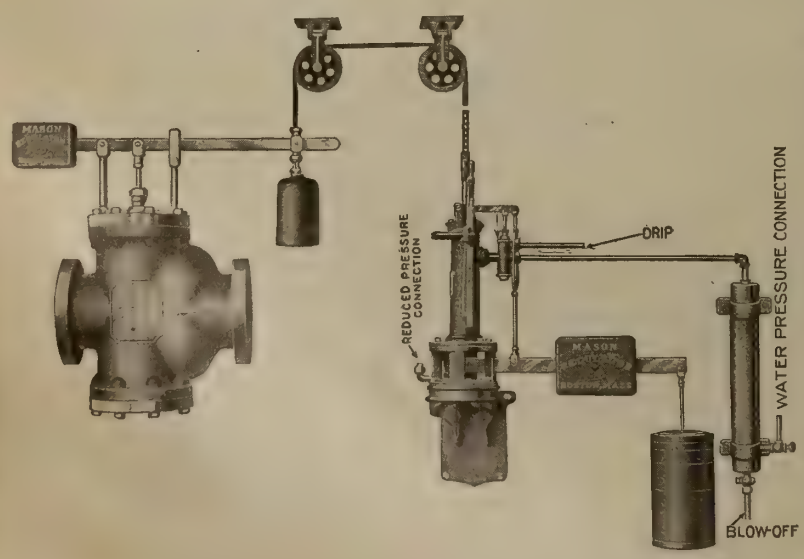
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VOL. XVIX. GARDENVALE, P. Que., April 28th, 1921. No. 17

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal,
'Phone Uptown 7773.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

HOW THE TEXT BOOKS WILL HELP THE FOREMAN.

In most cases the foreman of a department is selected from the rank and file because of his ability to perform all the operations carried on there. This applies to pulp and paper mills as well as to other industries. There are certain education fundamentals that must be met, but many men are promoted to the position of foreman in emergency when they have scarcely the minimum of training. When a man is promoted to foremanship who can only read and write a little and carry out the most simple calculations, and that often very imperfectly, it means that he has not been able to boaden his perspective or enlarge his capacity by the study of material that would help him to be more efficient in conducting his department. It is being more fully recognized on every hand that the position of foreman is something more than that of the glorified workman. It carries a sense of responsibility and involves need of executive ability which have heretofore been largely disregarded in the selection and development of such men. The United States Bureau for Vocational Education has recognized the importance of the foreman as the key man in industry and is continuing a plan found so successful in the past, of organizing foreman training conferences in large plants and industrial centres. The result of such work, which is also being conducted to some extent by private agencies, is that on the foundation of skill and knowledge of his own part of the plant, the foreman is instructed and developed along administrative lines, so that he is in a position to plan the work of his department more efficiently, to understand the relation between his department and the organization of the business as a whole, and in his position of being intermediary between men and management, is able more successfully to maintain cordial relations and smooth and efficient operation.

With all due regard for the importance of developing the side of the foreman's character just mentioned, one cannot lose sight of the fact that knowledge of his own industry in general and his own department in particular, is the foundation of a foreman's success. There is no question but that men have greater respect for the leader who has a wider vision and a greater knowledge than they have. Some foremen are able to acquire such by experience in many plants. This is about the only kind of moss that a rolling stone gathers and it often stands a man in good stead. A broad working knowledge, however, can be obtained by intelligent study. It is one of the principal purposes of the Textbook which is being prepared for the pulp and paper industry, to provide an opportunity for ambitious employees in the industry to study the operations involved in the various departments both in pulp manufacture and in the making of paper. Besides thus providing the opportunity for any one to acquire a broad knowledge of the industry by careful reading, one may also become more fully informed with regard to the equipment and operations involved in each department by a close study in a more detailed way of such equipment and operations.

The value of the books to the foreman is not confined alone to the opportunity for him to increase his own ability but it helps him by giving his men a chance to study their own work and thus become more efficient and capable. This improvement in the character of the men in his department raises the intelligence of the whole force and enables the foreman to do his work with the intelligent co-operation of assistants who are thoroughly familiar with the principles involved in each process and who understand the functions of the equipment. With his best men studying their work in this way, the foreman may have to exert himself to keep a few jumps ahead of them but he will find that the added incentive and enthusiasm of doing work that is understood, fully compensates for the mental effort involved. He will find that directions are immediately understood and properly executed and that the efficiency of his department and the smoothness with which the work goes on are considerably increased. It seems likely also that he will have one or two understudies who can act in case of need, as assistant foreman, thus relieving him of much of the worry of everyday details and giving him opportunity to study the operation of the plant as a whole and particularly the relations between his department and those preceding and following it, thus fitting him for promotion as vacancies occur in higher positions. Even disregarding the thought of immediate advancement, the more thorough understanding of his work makes it more interesting and worth while to him and makes him more contented and happy in the knowledge of his ability to do his own important part in the most satisfactory manner. This satisfaction is in large part its own reward, but the ability that goes with it is seldom overlooked by intelligent

management without more tangible expression of appreciation.

There is no one in the industry who can read English who will not profit by a study of these text books. The first two volumes deal with Mathematics and Elementary Science which form the foundation for the subsequent discussion of the equipment, processes, and principles involved in pulp and paper manufacture. The editor of the Text Books anticipated some disappointment that the first two volumes to appear were of this preliminary and elementary character but he has been not a little surprised, and greatly pleased, with the interest that is being shown even in the Arithmetic and Elementary Physics, not only by mill men, but also by college graduates who have not previously appreciated the many points at which these subjects bear on everyday mill work. They have expressed themselves as greatly pleased with the way these subjects have been handled and feel sure that a careful study of these elementary sections will be of great assistance to operatives as well as technical men, in understanding the work done in each department.

Plans are rapidly developing for the distribution of the books in Canada and an announcement will be ready very shortly giving full particulars. In the meantime any who wish to begin on the series may place their order for the set, which will consist of five volumes, accompanied by $5.00 in payment for Volume one. Volume two is printed and is ready for binding and will be available as soon as the book binders in New York resume work.

A NEW WAGE AGREEMENT.

The discussion of the new wage agreement to replace the present arrangement between the Unions of Pulp and Paper Makers and some of the Manufacturers of these products is now engaging the attention of the industry. It will be recalled that about a month ago the Unions decided to ask their employees for an increase of from 5 to 10 per cent in their wages, but subsequently at a meeting of representatives of the unions and about 50 mills, the latter announced that there would be a reduction of 30 per cent from present rates and suggested some changes in working conditions. From recent developments it seems that both sides had over-stated their expectations, perhaps with the thought that the higher the aim the higher the hit. It is difficult to know exactly the motives or the expectations in either case.

There are several difficult features in the wage situation that affect the paper industry which perhaps do not apply generally. In the first place, the unions are international bodies and an agreement on such a subject naturally applies on both sides of the line. With wages at the same rate in both countries or with the same change in wages applied to both countries, the scale would seem to be a bit out of harmony with the fact that living costs have dropped further in the United States than in Canada. A uniform application, therefore, would seem to entail some unfairness. Another point is that when the unions formulated their demand for an increase in wages, the paper industry had just come to the end of an unusually profitable period and was still relatively prosperous in comparison with other industries, in many of which decreases in wages had already been agreed to, and in some cases had even been proposed by the workers themselves in these lines. Since that time a good deal of the gloss has worn off the paper situation and reflections are not so bright as they were. Wages, and salaries as well, are being cut on every hand.

The desire of the manufacturer is to bring his costs of production to a point where the consuming public with their generally diminished revenue can afford to buy his goods. This cannot be done unless every expense factor in his business is brought to a lower level. Costs of raw material have in nearly all instances dropped enormously. Advertising is beginning to feel the pressure and magazines and newspapers are smaller now than they have been in years. Selling expense has been decreased in some instances by cutting salaries and, relatively, by much greater activity of the sales department. Profits and dividends are only names to many a producer today. Many employees have come to realize that the manufacturer cannot afford to carry on any longer on the old scale of wages, which means doing business at a loss, and have agreed in a friendly way on a lower basis. Where wages, due to cutting or resulting from the inability of the manufacturer to sell enough goods to keep working full time, have dropped off more rapidly than local costs of food, rent and clothing, there has been hardship and there will be hardship until buying is resumed in greater volume.

The point which seems difficult for many to understand is that a dollar actually will buy more now than at any time during the last three years. This makes it hard for people to realize that while they are getting fewer dollars they are getting a greater purchasing power with the dollar so that the aggregate received in terms of commodities is not decreased in the same proportion as the cut in wages. The relative improvement in the worker's condition, over what it was prior to the war, is therefore maintained so long as there is no great difference between decreases in wages and in living costs. There are two principal elements then in the wage decrease, one is the absolute necessity that the manufacturer reduce his costs or go out of business, with the resulting entire stoppage of work for his

employees, and the gradual drop in costs of living which compensates for and alleviates the smaller pay envelope.

It seems to us very unfortunate at a critical time like the present that a body of employees should demand a wage which they know it is absolutely out of the question for them to receive, and on the other hand, for representatives of manufacturers to decrease wages beyond the rate at which an amicable settlement could be reached. If there is likelihood, and there may be grounds for such anticipation, that costs of living will continue to decrease during the coming year to points considerably below the present levels, then it would seem at least good policy to impose the sliding scale so as to bring the ultimate decrease gradually into effect rather than to strike bottom without any intermediate breaks, and have the greater likelihood of serious sprains.

A year ago there was little or no difficulty in getting to a satisfactory arrangement, as the industry was in a profitable condition and employees were generally contented. When the mills could afford to increase wages, there was practically no difficulty on either side. That was a fat year, but, contrary to the plan of Joseph and Pharaoh, the government did not permit all the excess to be stored against the lean year which is now upon us. Consequently there is not sufficient reason to continue the old ration any longer. The situation at present is much more difficult and it seems that only by the fairest and most generous agreement on both sides can the usual happy relations be maintained and the mills employing union labor kept in operation.

ENJOYED "THE GRAY TERROR".

In a letter to the Editor, a reader says:

"I read with great interest the very clever little story emanating from the pen of Mr. Dawe. It certainly makes good reading, and the author deserves a lot of credit for trying to make people realize just how important paper really is. As I was reading the story, there came a thought which would perhaps be worth recording in your Cobwebs column. It is indeed fortunate that Mr. Dawe did not place the scene of the story in some manufacturing city in Germany, where a goodly proportion of the population wear paper clothing! The explosion would have been still more disastrous! And how about the ladies wearing cellulose silk hosiery?"

COBWEBS.

There is also satisfaction in reading of the good work that pulp and paper men are doing in rendering service to the public outside of their business. An instance of this generous endeavor to make Canada a better place to live in is the service of Mr. F. B. Whittet, Treasurer of the Riordon Company, as President of the Shawbridge Boys' Farm and Training School. The work of this institution is well known for its success in setting on their feet and on the road to honest productive labors, many boys who have momentarily slipped on the pathway of life.

Ontario seems to know pretty definitely what is is to be done with booze. Half way measures will not work. The Ottawa River divides two regions as distinctly different, in this regard, as those separated by the Rio Grande. It is up to the people of Ontario and Quebec to comply honestly with the laws of each province and give the world a chance to know which system really is the better.

It has been intimated that one reason why the Canadian Government is anxious to send a representative to Washington is because money has been appropriated for the purpose and ought to be spent. Any government that has such an item on his books should be proud of it.

There is a great fight on in England over the proposed import duties on paper. Apparently tariff protection is the only means available for stimulating the British industry, which is in a very run down condition. Paper makers are tied up—and down—with contracts for high priced pulp and large supplies, so that countries making their own pulp are converting it into paper and dumping it in England at prices that threaten to annihilate the British mills. We hope they get a proper tariff, even if it means a more difficult market to sell in.

Mr. Walter J. Raybold, the new president of the American Paper and Pulp Association, is secretary of the B. D. Riding Paper Co., the first mill in which the editor worked. We are greatly pleased with the honor conferred on a good friend but must disclaim any responsibility for his election.

SOME FINE ISSUES.

The Convention Numbers of the American paper journals are fine examples of trade literature. The editors and publishers are to be congratulated on the excellence of these special numbers and the amount of advertising. They show the importance of the industry.

NOT OUR HOWARD.

Mr. Tarzan Jones was sitting down to breakfast one morning when he was astonished to see in the paper announcement of his own death.

He rang up Howard Smith at once. "Halloa, Smith!" he said. "Have you seen the announcement of my death in the paper?"

"Yes," replied Smith. "Where are you speaking from?"—London Telegraph.

The New Hall Process of Grinding Pulp.*

Report of the Groundwood Committee, T.A.P.P.I.

By W. A. MUNRO, Chairman.

The Groundwood Committee has investigated a subject, "The Hall Process of Grinding Wood," that has marked one of the greatest steps forward in the scientific manufacture of groundwood pulp. This process is known to some extent by all groundwood pulp manufacturers; some have a clear conception of what it accomplishes, while others have but a hazy idea of the subject and no definite working knowledge of it.

The Groundwood Committee has based the material and the statistics in this report entirely on a questionnaire sent to the mills operating under this process, and has endeavored to present the subject from three angles, that of the grinder room, the paper machine room and the press room.

So far as we can discover, any effort to improve groundwood, or the methods of making groundwood, that can be connected with this process, dates back only to 1914. To be sure there were spasmodic efforts made in this direction from time to time, but until that year, there appeared no one with sufficient zeal or initiative to inaugurate a sufficiently broad series of experiments to insure the finding of the "Better Way," if such a way were in existence. The first thought along this line concerned the preparation of the wood to be ground, and a tank was rigged up for the purpose of steaming or boiling it before grinding, and at the same time a great deal of thought was given to the subject of varous types of burr, and the influence of certain burs on the quality of the pulp, particularly with respect to the fiber length.

It may be of interest to note that the suggestion to groove the stone came first in an entirely accidental manner. It was observed one day that certain of the pulp-grinding stones, as they came from the quarry, were dressed differently from the others. This dress evidently put on by a tool working across the face of the stone and parallel to the shaft on which the stone would be hung, seemed to leave the face of the stone in the shape of flat-topped ridges, and from this suggestion there eventually worked out a burr, the action of which was to shape these ridges, and to separate them by grooves. In actual practice it was found that these grooves performed a most important function, namely, that of providing a recess in which pulp ground under one pocket could escape regrinding under the other succeeding pockets, thus preserving intact the particles of fiber so necessary to the formation of a perfect sheet of paper.

With these two ideas coordinating, namely the preparation of the wood by boiling and the use of a marker or grooving burr crossed with an 8-cut spiral burr, the first working experiment was made at the mill of the St. Regis Paper Company in September, 1914, with the result that about twenty-five tons of paper were made without the addition of sulphite to the groundwood. This pulp ran well on the machines and had a good pop test. That it ran equally well on the presses is attested by the fact that it went through without any criticism, and it will be remembered that in 1914, publishers were not inclined to withhold criticism where it was thought due. It was found, however, that the additional labor involved, the expense of live steam, etc., rendered the boiling process too expensive, that even though sulphite could be dispensed with wholly or in part, there was no important money saving effected, so the practice of boiling the wood was discontinued, and the attention turned wholly to the grinding of the raw wood, keeping in mind the fundamental idea of preserving the fiber length as much as possible. This practice proved so successful that important reductions were made possible in the amount of sulphite used.

About this time important changes in the control of the St. Regis Company had the effect of transferring the field of experiment to the Taggart Mills, owned and operated by the late Mr. George C. Sherman. Here the same general effect followed the introduction of the burrs and practice inaugurated at the St. Regis mill.

Soon after, these burrs and their system of operation were introduced into several other mills which we will designate as No. 1, 2, 3, etc.

No. 1. Here the demonstrator used the ¾ marker and crossed it with an 8-cut spiral.

No. 2. Used ¾ marker and the 8-cut spiral but determined to dispense with the marker temporarily, using instead of the marker, a 14-diamond.

No. 3. The same as number two. From this point on the marker and the diamond were generally used. It was found afterwards that a more even grade resulted from the use of the No. 4 marker and the diamond than from the spiral burrs.

To obtain the largest possible amount of real usable fiber from each block of wood should be the aim of every progressive pulpmaker. When he has accomplished as much as he can along this line he can still strive to obtain the maximum production from each stone, from the horsepower available, and from each dollar of payroll.

The Hall process enables the pulpmaker to approach the first goal closely. He can keep the surface of each grindstone in such a condition that a very large part of its surface is in active grinding condition. He can also keep this grinding surface smooth, thereby eliminating the production of slivers. Still further he can keep this smooth surface open and free from glazed spots, thus eliminating the production of very short fine fibers or flour. In this way the two sources of loss are controlled and the result is a close approach to the largest possible yield of pulp from the wood used.

From another point of view, the paper machine can be run faster and safer with this pulp than with pulp that is constantly varying in freeness over wide ranges. The sheet made from this pulp is easy to press out and consequently easy to dry. The supplying of the paper machine with more uniform stock cuts down the number of adjustments that the machine tender has to

*Report presented at the annual meeting of the Technical Association of the Pulpwood Paper Industry, New York, April 11-14, 1921. See also Pulp and Paper Magazine, Sept. 5, 1918.

make to meet varying stock conditions. This permits him to pay more attention to the mechanical condition of his machine which is very necessary in these days of running machines much above the speeds for which they were designed.

The grinder room is the only place affected when installing the Hall process, and here only a few changes are required, such as raising the stock dam to deepen the stock pit, and equipping the grinders with a doctor board to prevent the stock from being carried around with the stone. There is no need to change the original layout of the groundwood mill. The dressing put on the surface of the stone is the most important feature of the process, as this is what does most to produce the long, strong and uniform fiber desired.

First of all, the pulp stone is trued up until it is perfectly round and free from sand holes or other imperfections. Then the pattern is applied by means of a special flat bottom burr and a diamond burr. A heavy impression is never put on the stone, light and frequent dressings being the rule. No fixed schedule is worked out, each stone being studied for its hardness and ability to retain its pattern and sharpened when necessary. Not more than a fifth of all stones are sharpened at one time.

It was found by your committee that the effect of the Hall process varied with different mills, but all reported that this process produced beneficial results. The degree of success depends entirely on the man in charge of the groundwood mill and how closely he watches the stones and the resultant pulp.

One mill reported a saving of 50 percent in the amount of sulphite used. They had formerly used 27 percent and under this process they were using but 13 percent. They also reported an increased grinder room production and a greater yield from a cord of wood.

Another mill reported a saving in sulphite of 25 percent and an increase in paper machine production.

Another mill claimed that by running their grinder room under this process, they could grind wood with an expenditure of but 54 horsepower to a ton and could use but 14 percent of sulphite on their paper machine.

Still another informed your committee that they could run for weeks on a wholly groundwood sheet and that their percent of sulphite never ran above six.

The installation of this process by mills using groundwood in either small or large proportions in the manufacture of paper would increase materially the amount of paper from a cord of wood and in that way, conserve the stumpage of this country and lessen the amount of cut needed to supply our mills.

This saving in wood or stumpage is accomplished in two ways: First, by decreasing the use of sulphite, which takes approximately two cords of wood to each ton of pulp produced, or more than twice as much wood as is needed to produce a ton of mechanical pulp. Secondly, by obtaining a higher yield from a cord of wood under this process than by any other system or process.

In the case of the reduction in the amount of sulphite, and the consequent saving in wood a 100-ton newsprint mill formerly used 25 tons of sulphite daily or 50 cords of wood. The use of this process cut the sulphite consumption in half. As a result only 25 cords of wood were needed to make the required amount of sulphite.

The groundwood mill formerly had a yield of 2,100 lb to the cord (rossed) and 1,820 lb to the rough cord. After installing this process the yield was 2,350 lb to the rossed cord and 2,000 lb to the rough cord.

Wood used before installing this process:

50 cords to make 25 tons sulphite.
83 cords to make 88 tons groundwood.
133 cords used in manufacture.

Wood used under the Hall Process:

25 cords to make 12½ tons of sulphite.
88 cords to make 88 tons of groundwood.
113 cords used in manufacture.

This saving of 20 cords a day amounted to over 6,000 cords in the course of a year and comprised 15 percent of the company's total cut.

Besides this saving in wood, there are several other factors that add to its value. First, there is a slower depreciation of the woodlands. Second, there is less labor cost per ton, due to the smaller amount of wood to be handled. Third, greater grinder room production with the same equipment and horsepower.

However much these might amount to, the greatest saving or the ultimate effect of the process would be, that every seventh year the mill could be operated without any expense for wood.

The reduction in sulphite by the substitution of this groundwood does not reduce the quality of the paper in any way, rather it seems to improve its running qualities on the presses. There are a number of press room superintendents who express a preference for paper made under this process with a low percent of sulphite.

One has informed your committee that the paper received at their press room made under this process, ran better than usual run of paper. It had a better finish, took ink better, was stronger, and had more stretch.

Another expressed himself as follows: "We have during the past year and a half used in our pressrooms considerable paper made under the Hall process and can say that the results obtained in regard to the running, printing and general service of this paper has been satisfactory in every way. In fact it has been much more satisfactory than some of the paper which is made according to the regular standards of grinding wood and using sulphite as carried on in most of the newsprint mills in the country."

It is of the utmost importance in the Hall process of making groundwood, that the process be watched closely; when this is attended to, the results obtained in making paper when the stock goes to the machines are very satisfactory indeed, from the pressroom standpoint. If the pressrooms through the country could have paper made under the Hall process, with the system carried out correctly, and other conditions being right, the results would be satisfactory to publishers in general.

It is stated that an official report of the union vote will be made to the manufacturers' committee at a meeting next week, and further efforts will be made to bring about a settlement. Among the six companies whose agreements will expire on the 1st May is one Canadian concern, namely the Fort Frances Pulp and Paper Company. Among those whose agreements will expire on the 11th May are the following Canadian companies: the Abitibi Paper Company, J. R. Booth, Ltd., the E. B. Eddy Paper Company, the St. Maurice Paper Company and the Spanish River Pulp and Paper Mills.

British Trade News

(FROM OUR LONDON CORRESPONDENT)

London, 11th April, 1921

Strikes, and rumors of strikes,—and discussions and conferences on them—are the principal topics in England today. The railroad men and transport workers made a statement that they would support the coal miners if some sort of terms were not soon fixed up and the Government retaliated by calling up a section of the Army and Navy reservists to deal with current events while volunteers were asked for to act as defence units. This move on the part of the Government had a great moral effect on the strikers and would-be strikers as it not only called men away from the paper mills but it touched the miners and the railroad men. Now, it is stated, there may be no triple strike and there is every chance of a settlement with the miners, who have succeeded in some cases in damaging the pits by water, or preventing pumping operations to be carried on. In the case of large paper mills they have from 2 to 3 weeks supply of coal and the smaller ones, such as those in the South of England, can carry on for at least six weeks. The slackness prevailing in the industry will help to eke out the coal supply, so that looking round generally the papermakers have not yet fully felt the coal strike, but a rail strike would be more disastrous to them.

Papermakers and Protection.

I have dealt fully elsewhere with the suggestion that paper should come within the scope of the Anti-Dumping Bill. It is a burning question here at present and very few papermakers came to the assistance of Mr. Stanley Cousins to help him out in his contention, which is feasible, sensible, and fair when it is read in the "Pulp and Paper Magazine." What is the use of running an industry when the products of it are sold under cost price? That's the position in England today under a Free Trade scheme, but Mr. Cousins is only in favor of putting a duty on imports from such places as Germany. Why? Canadians who have followed my notes from time to time on Germany will remember that in November last I wrote the German could buy his pulp in Finland at 150 Marks to the English sovereign (the Mark today is 2 cents and the sovereign is worth 250 Marks) and dump it down in England at 240 marks to the sovereign. He consequently could buy pulp cheaper and at lower wages produce cheaper paper than the British. It is this rate of exchange Mr. Stanley Cousins is "dead against" and he rightly says it is not fair trading. But the consumer does not care a frazzle. He wants paper for nothing, yet he wants to see a thriving industry. He is like some of the writers on paper subjects who say: "We are all Free Traders personally and Anti-Dumpers on the broad issue." It is very hard to convince people like this who put up for consumption such views when 26,201 workers are idle and 16,153 only partly employed in the paper mills. They go the way the wind bloweth them.

Lord Beaverbrook's Reply.

Lord Beaverbrook contributes a letter to the newspapers in which he says: "....But I may add that if I had to choose between a general allround tariff and the amazing proposal of the Anti-Dumping Bill to put a duty simply on debtor countries, I should unhesitatingly prefer the former plan. It is at least an understandable one, and if it did some harm might also do some good. But the duty on goods from debtor nations only cannot conceivably do any good to British industry while it is bound to cause a general disturbance in the world's newsprint market." Towards the end of last year Mr. Wm. Harrison, of the Hartlepools Paper mill after a trip in Germany studying conditions warned the British papermaking interests that the German was a very wily manufacturer and he would take advantage of the rate of exchange for the purpose of dumping cheap paper on the British market. And, added Mr. Harrison: "I for one am going to take good care that the papermakers of this country combine together, if necessary, to stop this dumping if it ever takes place...." This was the warning sounded last October and Mr. Cousins is now only asking that the British papermakers be protected against such tactics in countries where the money markets were in a turbulent state.

A Sellers View on Dumping.

A leading merchant says that dumping is not the fundamental cause of the acute position prevailing in the British paper trade. It is a factor, of course, as regards newsprint, Scandinavia and Findland in particular being the most serious shippers. Measures to prevent dumping might afford temporary relief to mills producing newsprint but an embargo on foreign newsprint opens up serious possibilities of retaliation, for Scandinavian countries might impose a tariff on pulp which would hit our mills severely. The root causes of the serious depression and unemployment in the trade are trade inactivity and lack of steady orders. These, however, are the views of a merchant. Scandinavia would think twice before tampering with duties on pulp because Canada is a sore thorn in her side. If there was more British capital invested in the Dominion for the production of pulp and more consideration given to the war motto "Trade within the Empire" there would not be all this talk today about what Scandinavia could do or would not do. This is a time for action—deeds, not words—and the sooner the British papermakers waken up to the fact the better for themselves. Indeed, they are out now to fight such bodies as the Newspaper Federation, who, after reading Mr. Stanley Cousins appeal to Parliament, passed a resolution as follows: "The Newspaper Federation views with apprehension the possibility of the inclusion of newsprint in the articles subject to the provisions of the coming measure for the safeguarding of industries, and draws the attention of members to the importance of making known to the members of Parliament of their area the serious consequences of putting their raw material in jeopardy of a duty of 33 $^{1}/_{3}$ per cent." This resolution is passed by sane businessmen who don't care what may happen to an industry while they get their newsprint at a price less than the cost of production. As a matter of fact they have not yet forgotten the high price they had to pay in war time. They will never get over the experience and they look on the paper manufacturer with a certain amount of suspicion today.

Notelets.

A portion of the machine house roof and other serious damage was done by a fire which broke out a few days ago in the Clyde Paper Mills, Rutherglen.

The Technical Section of the British Papermakers Association is going strong and papers being read are numerous. This week there will be an open conference in London.

Transactions of the Technical Section

INVESTIGATION INTO SPECIAL BRONZES.

(Continued from last issue.)

For the alloys containing less than 5 p.c. lead the "elbows" which in the cooling curves correspond to the points of the second critical surface are not pronounced enough (on account of the small liquid mixture rich in lead which begins to segregate at the corresponding temperatures) to allow of their being determined experimentally. So that we have not been able to draw the prolongation, towards the left, of the curve θ: although knowing (as is easily understood) that it must reach the point M. — The complex shape of the second critical surface must be approximately that indicated in Fig. 2 by light dotted lines corresponding to parallels of the surface itself.

From the significance found for the third critical surface (horizontal plane at 770 deg.) it follows at once clearly what significance must needs be attached to the fourth critical surface (horizontal plane at 550 deg. — corresponding to the critical points of column IV, table II.)

It is evident in fact that the lags found at 500 deg. in the cooling curves of the alloys in which the preceding lags at 770 deg. proved the formation of the solid β solution are due to the formation in the "solidus" of the same binary eutectic mixture (copper-

Table II, Part 2.

No. of sample	III Critical Point (lag)		IV Critical Point (lag)		V Critical Point (lag)		Remarks
	Temp.	duration of lag in minutes	Temp.	Duration in min.	Temp.	Duration in min.	
8	—	—	—	—	—	—	
9	761°	1′	—	—	—	—	
10	763°	3′	—	—	—	—	
11	770°	5′	500°	1′	—	—	
12	770°	7′	500°	2′	—	—	
13	768°	12′	500°	3′	—	—	
14	—	—	—	—	—	—	
15	—	—	—	—	—	—	
16	763°	3′	500°	0.30″	—	—	
17	—	—	—	—	—	—	No. 17 The great variation in the percentage of tin is due to the fact that from the alloy mass there separated a small button containing 25.2% tin and 3.7% lead.
18	—	—	—	—	—	—	
19	768°	3′	—	—	—	—	
20	770°	7′	500°	1′.45″	320°	very short	
21	—	—	—	—	319°	"	
22	763°	1′	—	—	319°	"	
23	770°	3′	—	—	319°	2′	
24	762°	6′	500°	1′	319°	very short	
25	—	—	—	—	319°	"	
26	762°	2′	500°	1′	318°	"	

tin) with 26 per cent tin which forms in the binary copper-tin alloys at the intersection of the second curve-limit of the first miscibility gap in the solid state (OS in our diagram) with the first curve-limit of the second gap (QS in our diagram). The constant temperature at which is found the fourth critical point for the alloys of different compositions, and the fact that it appears only for the alloys, which show the third, corroborates our interpretation of the third critical surface, and proves still better that the solid α solution which crystallizes first from the ternary alloys of the series under consideration does not contain any lead. As to the fact that in the alloys with compositions nearer to line NA the fourth critical point does not manifest itself, this is due solely to the small amount of heat evolved in the formation of the eutectic mixture S: it is known that it is found true even in the binary copper-tin alloys.

Finally, if we try to find out the interpretation of the fifth critical surface (values in column V of our table) corresponding to an isothermal transformation, which takes place at a constant temperature (about 319 deg.) in alloys of various compositions, we see at once that on the basis of these characteristics and taking into account all we said at first we must admit that the breaks in the cooling curves corresponding to the points of this surface are due to the solidification of the lead separated out from the various molten alloys along the surface of incomplete miscibility of the three metals in the liquid state.

This being granted, we reproduce the micrographs of two of the ternary alloys examined by us in order to show how their structure corroborates our interpretation of the various elements of the equilibrium diagram. We confine ourselves to reproducing the micrographs of the two alloys only, because observation proves — as could have been easily foreseen — that two different types of structure present themselves only in correspondence to the two different courses of crystallization defined above for the alloys in which the solid β solution appears. But for all the alloys in which the saturation limit of the α solution[12] is not exceeded the structure is entirely analogous to that (already examined by a few experimenters) of the binary copper-lead alloys. In these the free lead fills the interstices of the mixed α crystals[13].

Hence, confining ourselves to the alloys in which appears the solid β solution (containing, namely,

Table III

Sample No.	Composition of the alloy Sn %	Pb %	Hardness Number	Sample No.	Composition of the alloy Sn %	Pb %	Hardness Number
1	4,5	0	49	17	4	6,9	46
2	8,8	0	63	18	3	6,9	59
3	16,3	0	77	19	3.9	7.0	80
4	25,9	0	230	20	2,4	10,6	39
5	0	10	27.2	21	8	10,4	48
6	0	20	23,8	22	13.9	10,4	86
7	0	40	13.8	23	4,1	14,12	39
8	4,1	0,95	57	24	9,2	15,3	57
9	8,1	1,1	67	25	19.0	5,0	130
10	14,1	1.15	83	26	20,4	8,8	130
11	3,9	3	46	27	21,5	8,05	150
12	7,8	3,2	61	28	11.0	5.0	70
13	13,9	3,1	83	29	17	5,0	109
14	3,99	5,0	46	30	5	20	44
15	8,0	5,0	61	31	24	5	182
16	13.7	5.1	93	32	12	20	70

amounts of tin greater than those corresponding to the points of line N A in the diagram of Fig. 2). We have said already that their crystallization takes place differently according as their composition corresponds to points that fall inside or outside of curve *d*, intersection of the second and third critical surfaces. It is easy to foresee why in the two cases even the structure of the alloys must be different.

In fact, in the first case — in which we have seen that the line traversed during the cooling by the representative point meets at first curve S corresponding to the limit of perfect miscibility in the liquid state and then moves along this line while at the same time there takes place the segregation of the mixed α crystals, and of the liquid rich in lead; and only after this course does it meet curve *e* in point O at which the solid β solution begins to form — it is obvious that in the cooled alloy there must appear the free lead mixed with the masses of solid solution.

This is evident in micrograph 1 of the accompanying plate which corresponds to alloy No. 23 of our table 2 — 14 p.c. Sn: 15 p.c. Pb — Treated with 50 p.c. nitric acid — Magnification 200 diameters.)

In this alloy (which belongs to the first type as in its cooling curve there appear the second elbows) may be seen the black lead masses enclosed in the solid α solution.

On the other hand in the second case — in which the representative point meets first the line *e* corresponding to the formation of the solid β solution; and it does not meet the line *d* until after having moved along *e* itself — it is obvious that the free lead must be found enclosed in the β solution.

This in fact appears quite evidently in micrograph 2 corresponding to alloy 13 in our table 2 (24 p.c. Sn: 5 p.c. Pb. Treated with 50 p.c. nitric acid. Magnification 200 diameters.) In this alloy (which belongs to the second type as its cooling curve does not show the second bend) the black masses of lead are seen (smaller than in the preceding one on account of the smaller amount of lead contained therein) scattered through the white borders (streaks in the eutectic) of the solid β solution.

The same types of structure are found in all the other ternary alloys examined by us: in these the free lead appears always enclosed in the α solution or in the β solution according as the alloy belongs — by its composition — to the first or second group. The various alloys of the same group differ among themselves only in the varying proportions of their constituents, viz. of α solution, of β solution (with the eutectic mixtures to which it gives rise according to the processes already examined for the binary copper-lead alloys) and of free lead.

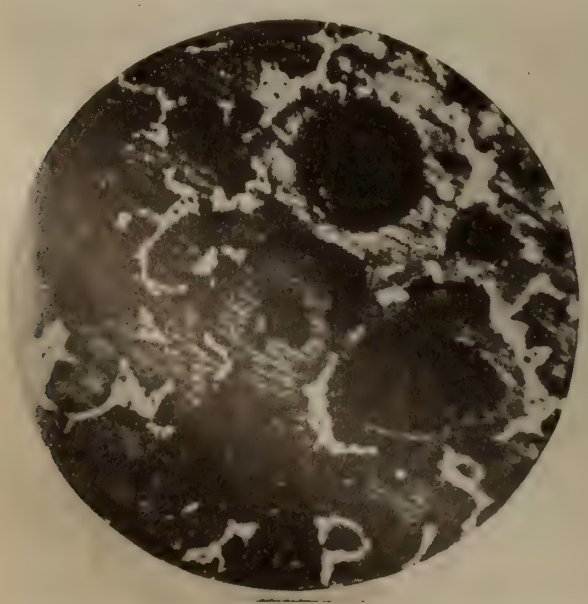
Having determined the conditions[14] of equilibrium and the structure of the ternary copper-tin-lead alloys, we started a series of investigations into their mechanical properties. While we reserve the publication of these investigations for the future — which will require a good deal of time to be completed, particularly with regard to the mechanical properties of the lead bronzes tempered under various conditions — we give in Table 3 as complementary to the data above the results of a first series of hardness tests carried out according to Brinnels method with the binary and ternary alloys dealt with in the preceding pages.

The tests were performed with a ball of 10 mm. diameter under a constant pressure of 500 kilograms: the hardness numbers were calculated by the usual formula of Brinell.

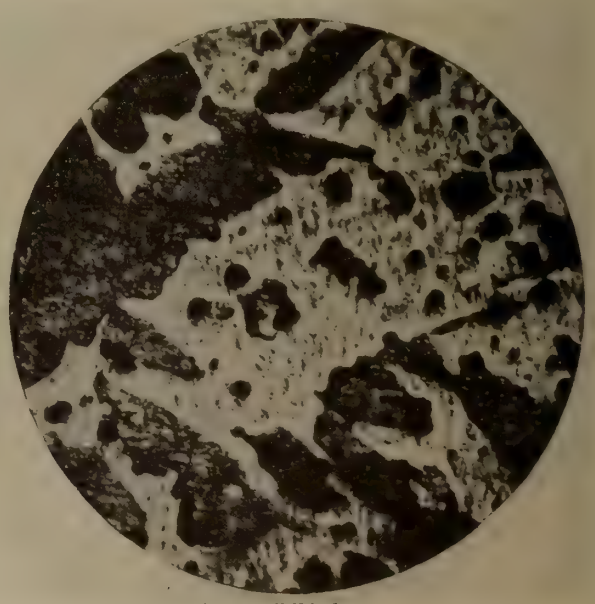
On the basis of the results given in the preceding table we constructed a gypsum model the photographic reproduction of which we give in the plate.

In this model the altitudes of the segments cut from the upper surface on the perpendiculars to the base plane are proportional to the hardness numbers of the various alloys whose composition corresponds — in the usual manner — to the points of the base triangle at which the above mentioned perpendiculars are erected. In our model the anterior (shaded) face corresponds to the binary copper-tin alloys (No. 5-7 in Table 3); the elbow formed by these two faces corresponds to pure copper.

From the examination of the model and of the numbers in Table 3 which, in order to facilitate comparisons, refer to various series of ternary alloys, in each of which the lead percentage has been varied, while maintaining as constant as possible the tin



Photomicrograph 1.



Photomicrograph 2.

(Note:—These pictures are reproduced from photostat copy of original, hence light and dark portions are reversed.)

percentage, it follows that the presence of lead does not affect considerably the hardness of the copper-tin alloys containing less than 14 p.c. tin. For this series of alloys the decrease of the hardness due to lead is not considerable unless the proportion of lead exceeds 10 p.c. This result deviates a little from those obtained by Guillet (loc. cit.). He says in fact that the hardness of the ternary alloys decreases rapidly with the increase of their lead content when this content begins to exceed the value of 3 p.c.; but it remains constant when the limit of 7 p.c. lead is exceeded.

However it is well to bear in mind that Guillet experimented with alloys still containing small quantities of zinc and confined his investigations to alloys in which the percentage of tin only varied a little from 10 p.c. (between 8.52 p.c. and 10.28 p.c.).

For the alloys containing more than 14 p.c. tin and above all for those containing little lead (less than 5-6 p.c.) the hardness on the other hand decreases rapidly with the increase of the lead content. This observation can easily be reconciled with the fact (already demonstrated) that on these alloys (and particularly) when the proportion of lead accumulates almost entirely in the solid solution (see phot. 2) contributing thus towards decreasing the hardness of that constituent whose prevalent function it is to impart this property to these alloys.

FOOTNOTES.

1. Work reproduced in Revue Générale des Chemins de fer, 1893.

2. V. Giolitti and Tavanti: On the tin-copper alloys (gazette chimica italiiana, 38, 1908, pp. 209-239.)

3. As a matter of fact, the hard constituent is largely formed from the solid β solution which forms at 790 deg. and only to a slight extent from the eutectic mixture which forms at 500 deg. and 480 deg. through the segregation of the solid solution itself.

4. The constitution of copper tin alloys: Jnl. of physical chemistry, 10, 1906, pp. 630-653.

5. It is known that in recent times the more accurate study of the lead and tin alloy led to the introduction of various new elements in the equilibrium diagram of the system formed by these two metals.

6. Giolitti and Tavanti, Gazz. chim. ital., 38, 1908, p. 209.

7. According to Guillet's data ("Industrial study of metallic alloys", appendix, p. 1906), the first equilibrium diagram of the binary alloys copper-lead determined by Roland Josselin was afterwards found by Roberts-Auster to be entirely wrong. The latter drew up a new diagram which (with the exception of the values of the temperatures and of the concentrations corresponding to the critical points) is in its general form quite similar to ours. Our data, however, are nearer to reality.

8. V. Gioliti and Tavanti, loc. cit.

9. As is known, this second surface cannot be drawn by points by means of thermal analysis: we can only say that it passes through point I and intersects surface AEFGH along the same curve which represents its intersection with the second critical surface L_1O.

10. In Fig. 3 are plotted in the usual manner the points corresponding to the composition of the various alloys examined. At these points have been erected segments perpendicular to the plane of the drawing (horizontal plane through N in Fig. 2) of a length proportional to the durations of the corresponding lags noted in the cooling curves. (See table 2, column 10.) Selecting various systems of points located on the same straight lines, the vertical planes passed through them have been assumed as brought down on the plane of the drawing. It is evident then that the intersection of the point system in question with the extremities of the vertical segments is a point of the curve of intersection of the horizontal plane through N with the surface of the durations of the isothermal conversion at 770 deg. in the sense introduced by Tanman. In this manner line AB has been drawn.

11. When allowance is made for the inaccuracies caused by the unavoidable phenomena of incomplete equilibrium between mixed crystals and liquid residue, due to the too rapid insufficient slowness of cooling.

12. That is, in so far as the field examined by us is concerned, the alloys containing less than 7 p.c. tin, in which the break of the temperature at 770 deg. corresponding to the formation of the β solution does not take place.

13. We do not deem it necessary to reproduce micrographs of alloys of this series, as there are many reproductions thereof in the works of other experimenters, such as Charpy's on lead bronzes.

14. As appears from the data referred to in the course of this memoir, we confined ourselves to investigating the lead-copper-tin alloys in the cases where the rate of cooling is sufficiently slow to insure our having practically reached the conditions of perfect equilibrium. We are running now more examinations (by means of more or less rapid "tempering" processes) of the phenomena of imperfect equilibrium which are as important for these alloys as for the binary copper-tin alloys.

15. Guillet explains this last observation assuming that — on account of the liquation phenomena found in lead bronzes — the lead itself accumulates in the interior zones and at the base of the ingots, maintaining itself in their central zones at a concentration of 7 p.c. even when its proportion in the molten alloy exceeds this value; and as it is from the center of the ingot that the samples for the mechanical tests are taken, Guillet's assumption would explain the constancy of the results of the mechanical tests performed on the alloys of different composition containing more than 7 p.c. lead.

Leaving aside the fact that some chemical analyses performed on the samples themselves used for the mechanical tests would have enabled us to determine at least the accuracy of Guillet's hypothesis. The fact remains that the results of our analyses (see Table 2, columns 5 and 6) do not lead to the assumption, not even for the alloys containing 12 p.c. lead, of such intense liquation phenomena as assumed by Guillet. Moreover, the same conclusion results from the microscopic examination of the entire longitudinal section of the various ingots.

16. In which case the solidification of the alloy takes place clearly according to the process designated as "first case".

Note: A few reprints of this article will be available, the number depending on requests received by May 5. If you want one, please order promptly.

The Rinman Modification of the Sulphate Process.*

By BROR. N. SEGERFELT.

For many years the Engineers in the cellulose industries of Sweden have carried on extensive investigations for the purpose of obtaining an increased amount of by-products from waste liquors. Among the well known men connected with this work may be mentioned Hugo, Wallin, Ekstrom, Prof. Klason, Sandberg, Strehlenert and Rinman.

Up to date Mr. Rinman has met with the greater success. Having had direct connection with the operaton of the mills as well as the laboratories has given him excellent opportunities to carry on experimental work. At the beginning of his investigations he was convinced that if the same quality of pulp could be obtained by using caustic soda instead of salt cake he would then have taken a step forward on the road to success. As a result of many years of hard labor he finally devised a method of cooking whereby even better results were obtained by the use of caustic soda than with the salt cake and in his connection with several mills in Germany making pulp from straw, he demonstrated this fact on a commercial scale to the satisfaction of everybody. His methods were later adopted in several sulphate mills in Scotland and Sweden where kraft pulp was being made from wood.

Following are extracts, from some of the Rinman patent claims, as well as explanations of the advantages and results from the Rinman process.

(1) A method of producing cellulose by cooking the wood with weak caustic solution with the aid of a reducing material, preferably mercury.

(2) That the main operation is done at a temperature not exceeding 170 deg. Cent.

(3) When the cook is finished the pulp is washed in ordinary diffusers and the black liquor passed to evaporators and evaporated to about 35 deg. Bé. at 60 deg. Cent.

(4) To the evaporated black liquor is added a sufficient amount of fresh caustic soda to compensate for losses, also lime is added.

(5) The mixture is now placed in a retort for dry distillation and distilled at not over 500 deg. Cent. In order to obtain the highest yield of acetone, methyl alcohol and oils, a small amount of steam is admitted to the retort.

Besides the above mentioned by-products, fuel gases and coke are also obtained. The fuel gases are used direct to heat the retort; the coke is burnt in a rotary burner and the ash dissolved in water, the sludge of lime separated and fresh liquor obtained for cooking purposes.

Advantages of the Rinman Method of Pulping.

The bad odor is entirely eliminated.

The yield of pulp from the wood is as high or higher when the Riman method is used than when the ordinary sulphate method is employed and a better quality is obtained.

There will be no hard scales on the heating surfaces of the evaporators or concentrating apparatus because we operate under low temperatures without the use of smelters where silicates are usually separated out.

The loss of alkalies is only about 2 per cent to 3½ per cent of the pulp produced, while by the sulphate process 10 to 25 per cent is lost. This great difference is due to the fact that the high temperature in the smelters used in connection with the sulphate process carries a large quantity of the alkalies up through the chimneys.

The lime consumption in the Rinman process is less than in the sulphate, only about 10 per cent of the air-dry pulp being required.

At a test made at Gryksbo, Sweden, the following results were obtained:

	Rinman Method	*Ordinary Sulphate Method*
Breaking length	7678 meters	7554 meters
Stretch	4.47 per cent	4.72 per cent
Yield about	50 p.c. air-dry	38 p.c. air-dry

Bleachability tests made at Skoghalls sulphate mill, Sweden, have shown that a clear white pulp can be made having a bleachability of 15.5 per cent and a yield of 39.3 per cent from bone-dry pulpwood.

The Rinman process is very flexible. It is quite possible to produce any quality of pulp desired simply by varying the cooking.

By-Products Obtained in the Recovery Process.

From one ton of pulp (2,240) pounds we obtain approximately the following:

Methyl alcohol	50 lbs.
Acetone	50 lbs.
Oils suitable as substitutes for gasoline	100 lbs.
Heavy oils (boiling point 150 deg. Cent.) ..	200 lbs.

The wood used in the foregoing tests was similar to the American white pine and jack pine.

By employing the Rinman method in making pulp from straw and grass the approximate yields are as follows:

Methyl alcohol	24 lbs.
Acetone	50 lbs.
Light oils	100 lbs.
Heavy oils and a varying amount of ammonia	200 lbs.

When tropical grasses are used, from 10 to 20 lbs. of paraffin is obtained having a melting point of 68 deg. Cent.

The oils, usable for the same purpose as gasoline, consist of ethyl methyl ketones, higher alcohols, and ketones and hydrocarbons. The specific gravity of these oils is about 0.81 and owing to this fact this oil has higher efficiency than gasoline, the oils are suitable for the same purposes as gasoline. The oils used in Diesel engines consist mostly of hydrocarbons with a boiling temperature higher than 150 deg. Cent.

Apparatus and Machines.

The mechanical equipment for a Rinman recovery plant is in use as pointed out before, in straw mills in Germany, but there is also one mill just starting, manufacturing Rinman kraft pulp from wood. The results from this will not be known until May or June. Also in Scotland one soda pulp mill is being changed to adopt the Rinman method.

The Rinman process is more especially applicable

* Communication to the Technical Association of the Pulp and Paper Industry for the Annual Meeting in New York, April 11-14, 1921.

to the soda mills because the entire equipment can with some slight changes be made use of. It is quite evident, however, that even the sulphate mills can adopt this method to great advantage. The bad odors from sulphate mills are generally considered a public nuisance; in fact, instances have occurred where injunctions have been served on mill owners to stop the operation of their mills. But while the writer does not consider this a serious matter, he certainly feels that other merits of the Rinman method will warrant the sulphate engineer giving it a most careful investigation.

British Makers of Newsprint Seeking Protection.

(Special From Our London Correspondent).

London, April 8, 1921.

Makers of newsprint in the United Kingdom are being placed in a jeopardised position—in fact some are already in it. And as I write a big "fight" is raging on paper as to whether papermaking in this country should be protected against Foreign imports, or, go on as we are going at present. It is a fight between the "Protectionist" and the "Free Trader", the producer of newsprint and paper in one part and the consumer in the other. In other words the Free Trader is a gentleman who wants an open competitive market in the United Kingdom where all countries can send their products, while the Protectionist gentleman says it is possible to tax the foreigner by an import duty and to make him pay toll for access to our markets. That is the difference of opinion between them politically. But the papermakers—and I know there are "Protectionists" and "Free Traders" amongst them —say we are in the position today that raw materials are so high in price we cannot sell paper at the same price newsprint and other qualities are being sold by Foreign producers. "Do you want to kill our industry?"

Naturally one might ask: How has all this difference of opinion arisen? Well, it has arisen over a measure before the Imperial Parliament which is known as the "Anti-Dumping Bill". It was to be debated this week, but owing to the present coal miners strike the debate was adjourned to next week.

Stanley Cousins Hits Out.

One of the best known Directors of British paper mills, Mr. Stanley Cousins, started the ball rolling in the present paper fight and controversy; but one would like to hear what he had to say in regard to raw materials, such as pulp, the imports of which the industry has to depend on. The Free Trader says: "If you put it on paper the Foreigner will assuredly get the import duty back on pulp." Mr. Stanley Cousins, however, realising that the position was becoming critical addressed the following letter to the London "Times" and it had a remarkable effect:—

"Sir—The critical position of the papermaking industry in Great Britain is shown by latest Government figures of unemployment. Out of 48,000 employees in British paper mills 26,201 are totally unemployed and 16,153 are on part time.

"This is brought about principally by dumped imports from

Finland . . . . . Sweden and
Germany . . . . . Norway

The depreciated German and Finnish currencies enable mills in those countries to quote prices delivered in England which are far below the manufacturing cost of British mills. Great Britain is the only market at this time, so manufacturers in Norway and Sweden are obliged to meet these low quotations and our home mills have been forced to shut down by this increased flood of imports.

"British mill owners, who realize the serious position of the industry, have reduced their contract prices to British consumers well below cost in an endeavor to keep our workpeople employed. The temporary closing of the markets in India and the Dominions, owing to financial stringency has cut off the chief export market of the British mills, but this is a small matter compared with the falling off in home production due to increased imports.

"It is of vital importance that any benefit from the proposed Anti-Dumping Regulations should be extended to the paper industry, and I feel sure that a realization of the critical position of the paper trade, in which nearly 15-16ths of our employees are wholly or partially unemployed, will not be lost sight of by Parliament in the action taken on proposed Anti-Dumping Legislation."

This letter from Mr. Stanley Cousins worked liked magic. "Free Traders" wrote that the Anti-Dumping Bill was "a measure of high Protection...It provides for an **ad valorem** duty of 33 1-3 per cent against goods imported from countries where the exchange is in our favor. This means favor to America and a handicap against France, Italy and Belgium. How will it influence our own prosperity?"

Then one gets back to the argument that British newsprint cannot undersell the foreign material at its undercutting price. What can they do?

The Newsprint Consumers Case.

After the letter written by Mr. Stanley Cousins appeared in the "Times" the paper consumers "had a go" at him. Lord Beaverbrook (interested in the London "Daily Express") and Sir Edward Hulton (another newspaper magnate) issued their side of the case, viz. the consumers of newsprint. Their manifesto was sent up and down the country and they heralded the fact that they wanted cheap paper. Indeed, they don't care where it comes from so long as they can get it.

These two gentlemen wrote: "We see that the paper manufacturers in England are asking that the clauses of the Financial Resolutions being debated in the House of Commons, which enable a 33 1-3 tax be put on imports of debtor nations should be applied to the newsprint industry owing to the lack of employment which affects it. The consumers of newsprint in this country would not, we feel sure, wish to do anything to hamper a British industry in difficulties, but it is as well that Parliament and the Board of Trade should know what the exact state of affairs is before they take action.

"Mr. Stanley Cousins says in a letter to the "Times" that the manufacturer here is actually selling below the cost price of production in the effort to keep men employed and that the state of affairs is due to the competition from Norway, Sweden, Finland and Germany—owing to dumping and the low rate of exchange with Finland and Germany. Supposing this to be the case what is his remedy? To put the 33 1-3 per cent tax on newsprint imports from these countries. Let us examine the consequences of such a proceeding.

Would the Canadian Market be Disturbed?

"To begin with," say Lord Beaverbrook and Sir Edward Hulton, "the tax cannot be imposed on the import from Sweden, any more than that from Canada, Newfoundland, and the U.S.A., because the rate of exchange is against us in all four countries.

"The first result will be that Sweden, taking advantage of the European monopoly thus conferred on her by the British Board of Trade, would export her entire production to Great Britain and make good her own deficiency by importing that of her excluded neighbors. The newsprint industry in this country would not be a penny the better for the transaction or employment increased in any way. If Norway or Finland still have a surplus they would be obliged to ship it to the New World, disturbing the American and Canadian market and ultimately our own, and setting free more exports to Great Britain from these countries.

"You cannot help a British industry by blacklisting the imports of a certain number of countries while letting the imports of others in free. Apart from the European supply altogether so long as Newfoundland, Canada, and the U. S. A. can send us newsprint free they will continue to fix the world price, which our manufacturers will be unable to alter. Nothing except a tariff on the newsprint import of all countries will be of the slightest use to Mr. Stanley Cousins and other manufacturers.

High Priced Pulp.

"The statement that the manufacturing industry is selling here below cost price is perfectly true. The further suggestion that this state of affairs is due entirely to competition from European debtor countries need qualification. It is also due to the fact that manufacturers are working off raw materials (groundwood and chemical pulp) bought in foreign countries under contract at the very high prices of the past year. At the best these contracts will not run out till June 1922, but the materials have to be used at some time or another and the consequent losses faced.

"The consumers of newsprint in this country certainly ought to consult together with a view to arriving at some means of assisting within the limits of their power an industry which employs so many thousands through a bad time. But do not let the manufacturers rush blindly to Parliament and a tariff remedy which will not cure a single one of their troubles and will do nothing except cause a general upset in the newsprint markets of the world."

In considering this question Canada enjoys a unique position. "Trade within the Empire" we are told and Canadians will have to watch closely this tariff question in England, as Canadian paper and Canadian pulp is appreciated probably more than any other. But the Scandinavians have got a hold financially and otherwise on the market here and the only opponent they are afraid of is Canada. It is up to Canadians now to say if their market would be disturbed by a duty on foreign paper! Also, Canadians must see that Canadian made newsprint still and will enjoy free import.

The London "Daily News" says that Lord Beaverbrook and Sir Edward Hulton suggest that a tariff on the newsprint imports from all countries should be an alternative. "Do Lord Beaverbrook and Sir Edward Hulton mean this proposal to be taken seriously?" adds the "Daily News", "or are they putting it forward as a **reductio ad absurdum** of the whole argument for tariffs? They profess great concern over the state of employment in the newsprint industry. Yet in June 1919, when the "Daily Express"—Lord Beaverbrooks paper — was fighting the war-time paper regulations, it was pointed out by that newspaper that: "while the printing industry is one of the greatest in the country, papermaking is a comparatively minor industry. Do Lord Beaverbrook and Sir Edward Hulton now maintain that employment will be increased by taxing the raw material of what they call the greater industry in order to protect the lesser?"

HELPING NATURE.

The development of tree planting on the wind-swept prairies of the west is the mission of a special car which left Ottawa for Calgary last week under the auspices of the Canadian Forestry Association. The car is not connected with any Government department or commercial interest but is one of the enterprises which the Canadian Forestry Association has put into effect in the course of its widespread educational campaigns.

Inside the car instead of the ordinary seating accommodation, is a row of about 120 seats, rising tier on tier, like a collegiate lecture hall and in this are delivered lectures on how to start tree planting, the value of shelter belts as protection for crops and live-stock, and other aspects of arboreal work on the prairies. The car is self contained in every way and has its own electrical plant so that when it arrives at some small out-of-the-way spot on the prairies, it is able to present motion pictures without being dependent on local resources.

The method of procedure is to travel over the western prairies and stop at centres where it is evident that there is need of tree planting. In advance the advent of the car has been advertised, and the co-operation of all public organizations likely to help is enlisted. Afternoon and evening lectures are delivered; local problems are discussed and questions are answered. Moving pictures which are shown illustrate the whole process of tree-planting from the seedling in the nursery to the ultimate mature tree. Sixty million seedlings have been successfully grown on the prairies, and the association has some fine photographs of well wooded areas that were formerly bare and open. The result in these areas has been that it is now possible to grow fruit and produce that formerly could not withstand the wind storms.

The Lecture Car was outfitted at Ottawa and was sent to Montreal for a day's inspection when Lord Shaughnessy and E. W. Beatty, chairman and president respectively of the C. P. R., paid it a visit and expressed great interest in the project. Mr. Robson Black of Ottawa is in charge of the Canadian Forestry Association's educational enterprises which, in Eastern Canada, are mainly concentrated upon the prevention of forest fires through winning popular co-operation.

Howard Smith Paper Mills, Ltd., Pioneers.

By A. R. R. JONES.

Among the pioneers in the pulp and paper industry on a great scale in Canada, high place must certainly be accorded to the Howard Smith Paper Mills, Ltd. The history of the Company in question, which was founded, some twenty years ago, by Mr. C. Howard Smith, its present President, has been marked by steady, consistent and continuous growth and progress. This has been due not only to high efficiency of organization, but also to systematic and tenacious adherence to a carefully devised policy which has placed in the forefront of its program, as an absolute essential, the maintenance of a uniformly high standard of quality in its products.

The Company's mills are situated at Beauharnois and Crabtree Mills in the Province of Quebec and Cornwall in the Province of Ontario.

The timber limits are located in the Gaspe Peninsula, and comprise an area of 480 square miles. These limits are exceptionally well wooded and carry a very heavy percentage of Black Spruce, the remaining woods being made up of White Spruce and some Balsam. The wood is of excellent growth and can be lumbered at a very low price. At Gaspe the wood is rossed and put on boats and conveyed to Cornwall entirely by water, where the sulphite mill of the Company is located.

The Company's Cornwall Division has been making paper since 1887 and was taken over by the Howard Smith Paper Mills, Ltd., in 1919. Cornwall, it should be mentioned, is approximately sixty-seven miles west of Montreal and is connected with that city by steamship and by the Grand Trunk and by the Canadian Pacific Railway lines. The sulphite mill at Cornwall is absolutely new and is acknowledged to be the last word in sulphite construction. The capacity of this plant is between seventy and eighty tons a day. The Company also has in process of construction an electrolytic bleach plant, where it will manufacture all its own bleach.

The paper mill at Cornwall has four Fourdrinier machines — one seventy-two inch, two eighty-two inch, and one ninety inch, — seventeen beaters, and four super-calenders, the widest of which takes a fifty-two inch sheet. This mill will run on Sulphite Bonds, Antique and Featherweight Books, No. 1 Books, Flat Writings, Blotting Papers, and one machine is now being changed over to manufacture Bristol Board. The Bristol Board at the present time is imported almost entirely from the United States. It should also be said that the Company is the first and only manufacturer of blotting paper in Canada. The plant at Cornwall has been thoroughly gone over and the new boiler house built of the latest design. The production at this Division will be at the rate of at least fifty tons a day.

At the village of Crabtree Mills, some four miles from Joliette, and between thirty and forty miles from Montreal, are located the Crabtree mills. The writer was recently afforded the opportunity of going all over this big plant and was profoundly impressed with the obvious excellence of its whole planning and organization and with the superb condition in which it is kept. Sulphite bonds are an important product of these mills and the daily output is very heavy. The mills are equipped with two machines, and the equipment of the beater and finishing rooms is the last word in efficiency. The latter of the two machines installed at Crabtree is equipped with the new Harland Electric Drive. A plant for handling old papers is being installed there. This plant will manufacture book papers at extremely low prices, as it will be enabled to do by reason of the fact that the Company has its own water power and plenty of water to wash the stock. It is readily apparent that on the building of these mills the most careful attention was bestowed, and the same remark applies to the arrangement of the location of the various manufacturing units. The product is notable for its cleanness, fine color and uniform high quality.

The main material used in the Crabtree plant will be old magazines and sulphite pulp. The output is 40 tons a day. The power of these mills is generated by the Company at its own development on the Lac Oureau river, on which the mills are situated.



Crabtree Division Recently Enlarged.

Power from this source also lights the village, which has a population of over 300, and the various houses in it. The Company has opened in the village an admirable club-house, with bowling alleys, billiard and pool tables, card room, reading rooms and a large lecture hall which is also utilized for various social functions, for the use of its employees. It also runs a boarding-house for their use, at which some fifty or so of them obtain excellent accommodation. Further, it has erected several admirably-planned houses, and is contemplating the erection of several more, to provide residential accommodation for married employees. In short, the village is in rapid process of development along the best and most modern communal lines. It should be added that, during the day-time, a school is conducted in the club-house by a highly qualified teacher.

At the Beauharnois Division, where the manufacture of paper was started in 1912 on an 86 inch Fourdrinier machine, the Company has a loft-dried mill and two Fourdrinier machines in operation. The more recently installed of these was built by the Dominion Engineering Works, Ltd., of Lachine, near Montreal. This plant represents the very latest in paper mill construction and equipment. It is completely equipped to manufacture the highest grade Bonds, Steel Plate, Stationery Paper, etc. The two machines mentioned produce something like twenty tons daily of tub-sized, loft dried, Bond and Ledger Papers and High Class Stationery Papers generally. The mill is situated on the shores of the beautiful Lake St. Louis, which is a broadening of the St. Lawrence river. This situation is an ideal location for the manufacture of paper, inasmuch as it is assured of an abundant supply of pure water of precisely that quality so essential to the making of high grade such as those for their pre-eminence in the manufacture of which the Howard Smith Paper Mills, Ltd., are renowned.

Indeed, with regard to all the three plants of the Company, it may be said that their location could not possibly be improved on. It is, no doubt, partly owing to this fact that the Company's costs of manufacturing are as low as those at which any mills can manufacture.

The officers of the Company are as follows: Mr. C. Howard Smith, President; Messrs. Jas. W. Pyke and J. Alexander Cameron, Vice-Presidents; Messrs. J. J. M. Pangman, D. W. Campbell, W. D. Robb, Howard Murray, and T. P. Howard, Directors; Mr. Harold Crabtree, Secretary; Mr. E. Howard Smith, Treasurer; and Mr. T. P. Howard, Comptroller. The office of Comptroller, by the way, is a new one, the creation of which has been rendered necessary by reason of the great expansion in the scope and business of the Company during the past few years. Approximately, the number of employees at the three mills is as follows: at Beauharnois, 220; at Crabtree Mills, 150; at Cornwall, 350.

The Company also owns the Federal Paper Company, which acts as distributor for a part of its product.

In conversation with the writer, Mr. C. Howard Smith, the President of the Company, said that, while manufacturing orders had been slack for some months, they had, since the middle of April, shown a decided improvement. He added that the sales through the distributing Company have been very good, particularly in writing papers.

SAYS CANADA'S TIMBER NOT IMPORTANT.

Ch. Groud, writing in Le Papier, for February 1921, seems to realise that our forests, in spite of the fine showing they are making at present in furnishing a very considerable proportion of the world's paper supply, are by no means inexhaustible. He says, "Canada and neighbouring countries export mostly soft coniferous woods; of which it is estimated they furnish about 85% of the world's consumption..... It is thus seen that there are actually two great timber reserves, viz., in central Africa and in South America. The timber reserves of Canada are not so important, though at the present time they supply the major portion of the world's supply." Forewarned is forearmed. By taking proper care of our resources we can surely retain the very enviable position we have acquired within the last decade.—A.P.C.

I. H. Weldon, head of the Provincial Paper Mills Company, Limited, Toronto, has returned from a trip to the Pacific Coast.



The Cornwall Division is situated on the St. Lawrence Canal System.

FOREST PRODUCTS; THEIR MANUFACTURE AND USE. By Nelson Courtlandt Brown, B. A., M.F. John Wiley and Sons, New York. 1919. 471 pages, 120 illustrations. Price $4.00.

One of the principal problems of the forester is to accomplish the complete utilization of timber cut. The more fully he is informed of general practice the more easily can he decide on the possibility which may be applicable to his own circumstances. One of the most complete and interesting reviews of the manner of utilizing the forest, is presented in Prof. Brown's book. The pulp and paper industry is honored by being the first one to be described. Forty pages are devoted to this branch of the subject. This chapter is credited to Mr. T. J. Keenan, F.C.S. who is known to nearly everyone in the industry as a former editor of "Paper" and secretary since its organization, of the Technical Association of the Pulp and Paper Industry. Mr. Keenan has succeeded in getting a great deal of useful material into the pages at his disposal and his treatment of the subject should be of considerable assistance to the forester or woodlands owner who is not an expert paper maker. A few typographical errors will doubtless be noticed by the critical paper maker but this does not detract seriously from the value of the chapter. It will be noticed with some amusement for instance, that the pulp is screened through a 10" perforation and that the disc of a chipper revolves at 2,000 revolutions per minute. As some of the material is quoted from some other sources, including Government bulletins, it is difficult to place the responsibility for the assumption of 15 cords as the average cut per acre for all kinds of pulp wood, and that 80% of the pulp companies own their own standing timber. To the bibliography might be added Huebner's "Coloring of Paper," Stevens' "Paper Mill Chemist," Sutermeister's "Chemistry of Pulp and Paper Making" (John Wiley and Sons) and Witham's "Modern Pulp and Paper Making," (Chemical Catalog Company). The names of the Pulp and Paper Journals might also have been mentioned.

As regards the general information given in the book, it is interesting to note that nearly twice as much wood is used in the United States for boxes and crates and for cross ties as is used for making woodpulp. Throughout the work we find tables giving in concise form, a great deal of valuable information regarding the consumption of wood for various purposes and the wastes and yields involved. The excellent illustrations include both diagrams and photographs. A number of various chapters have been written by specialists in their particular line which gives the book a greater dependability. Besides the chapters on general statistics and the manufacture of pulp and paper, the subjects include Tanning Materials, Veneers, Slack Cooperage, Tight Cooperage, Naval Stores, Hardwood Distillation, Softwood Distillation, Charcoal, Boxes and Box Shooks, Cross Ties, Poles and Piling, Posts, Mine Timbers, Fuelwood, Shingles and Shakes, Maple Syrup and Sugar, Rubber, Dye Woods and Materials, Excelsior, Cork.

The book had hardly been in the office a day before the editor found occasion to use it and had the satisfaction of finding an answer to a question from a correspondent. No doubt there are many among the readers of the Pulp and Paper Magazine who will be glad to have a copy of this excellent volume. It is distributed in Canada by the Renouf Publishing Company.

CHANGE OF ADDRESS.

News Print Service Bureau.

On April 25, 1921, the Office of the Newsprint Service Bureau will be moved from 18 East 41st Street to Room 607 Canadian Pacific Building—

342 MADISON-AVENUE

New York City

Which is on Madison Avenue between 43rd and 44th Streets, directly west of the Grand Central Station.

Correspondents and exchanges are asked to kindly change their mailing lists so that mail to arrive on April 25 or later will be sent to the new address.

R. S. KELLOGG,
Secretary.

THE WOODLANDS SECTION A.P. & P.A.

The following are eligible for membership in the Woodlands Section of the American Paper and Pulp Association: Managers of woodlands departments; woods superintendents; logging engineers; foresters, and others directly employed by pulp and paper companies in the acquisition, exchange, management and exploitation of timber or timber lands.

This section is now in a position to collect and disseminate to its members and the Industry valuable information in regard to methods of forest management and forest exploitation. The value of this Section will depend entirely upon the use members make of it in connection with the many practical problems of their timber land developments.

Some of the subjects for discussion at the first annual meeting of the Woodlands Section are: The Use of Tractors on Snow and Ice Roads in Woods Operations; Slash Disposal in Relation to Fire Protection and Reforestation; Sinkage of Pulpwood on Drives and in Storage; Woods Operations Costs; Methods of Forest Maps and Surveys in Relation to Taxation and Forest Management. Members of the Section would welcome the attendance of the Woods men of both American and Canadian pulp and paper companies.

HARD ON THE BRITISH.

The London "Daily Mail" publishes the following letter, inter alia, from a Dutch printer named Wm. Smit: "We get almost heaps of offers from German papermakers. From English firms we never see any. It is not only the low exchange which induces us to buy, but in the first place the quality, which is much better than that offered by our own factories. As a neutral I do not care a penny whether I buy from Germany or Great Britain, and we in Holland often wonder how it is possible that vanquished Germany can display such energy and tenacity . . . I am convinced that unless Great Britain alters entirely her business policy with the Continent (for instance by accepting the Continental weights and dimensions) Germany will again succeed in playing the first violin. The only way left for England to make headway against the competition of Germany is to be more efficient and more tenacious in her business methods. Many English firms have not the slightest knowledge of the ways of Continental business men. The best thing you in England can do is to be more industrious and more modern in your business ways . . . and to see that your people learn foreign languages, as we do in Holland." The latter part of this remarkable letter has been preached by British consuls for the past 15 years.

Technical Section

REVIEW OF RECENT LITERATURE

A-3. Treating Typhacea to obtain Fibrous Material.—Ger. patent No. 303,933, P. HORING, Nov. 2, 1917. **J. Soc. Chem. Ind.**, xxxix, 568A (Aug. 31, 1920).—Reeds such as **Typhaceae** before treatment with liquor to separate the fibrous matter are boiled exhaustively with water and after removal of the undissolved residue, the aqueous solution is evaporated to dryness under reduced pressure. A yellowish brown, hygroscopic product is obtained which contains 20 percent of ash, chiefly CaO and P_2O_5, nitrogenous matter, hexoses and pentoses, it possesses nutrient and therapeutic properties.—A.P.-C.

E-2. Resinous Products from Sulphite Waste Liquor.—Ger. patent No. 320,508, W. OEHL, Nov. 30, 1916. **J. Soc. Chem. Ind.**, xxxix, 568A (Aug. 31, 1920). Silicates or compounds of heavy metals are added to the sulphite waste liquor, whereby the $CaH_2SO_3)_2$ is converted into Ca silicate or into an insoluble bisulphite, which is then separated from the resin solution.—A.P.-C.

E-2. Treating Waste Sulphite Liquor for the Recovery of SO_2.—U. S. patent No. 1,342,721, AUGUST SCHAEFER, Portland, Ore., U.S.A., assignor to Northwest Process Company, June 8, 1928. **Chem. Met. Eng.**, xxiii, 301 (Aug. 18, 1920).—The SO_2 is recovered from the waste sulphite liquor in such a way as to leave the liquor in a favorable condition for fermentation, etc. The waste liquor as discharged from the blow-pit of the digester flows in a thin film over a series of vertically stacked steam-heated coils contained in a chamber in which a vacuum of 5 to 6 inches is maintained by a barometric jet condenser. The heat and diminished pressure facilitate the escape of SO_2, which is recovered by absorption in water in a suitable tank situated between the evaporating chamber and the condenser. The remainder of the liquor is discharged through the bottom of the evaporating chamber, neutralized and cooled. It may then be fermented for the production of alcohol.—A.P.C.

H-0; R-2. The bleaching of paper pulp. CLARENCE J. WEST. **Paper Trade J.**, lxxi, (Dec. 9, 1920).—Contribution No. 22 of the Committee on Bibliography of T.A.P.P.I.—C.J.W.

K-10; R-2. The sizing of paper—a reading list.—CLARENCE J. WEST. **Paper Trade J.**, lxxi, 20 (Nov. 11, 1920); 21 (Nov. 18, 1920).—Contribution No. 19 of the Committee on Bibliography of T. A. P. P. I.—C.J.W.

K-14. Evolution of the modern Camachine.—U. S. Paper Maker, lxii, 24 (Nov. 15, 1920).—Discussion of the Cameron slitting and rewinding machines.—C.J.W.

K-23; R-2. Blotting paper—a reading list.—CLARENCE J. WEST. **Paper Trade J.**, lxxi, 22 (Nov. 25, 1920).—Contribution No. 21 of the Committee on Bibliography of T. A. P. P. I.—C.J.W.

K-23; R-2. Filter paper—A reading list.—CLARENCE J. WEST. **Paper Trade J.**, lxxii, 15 (Oct. 1920).—Contribution No. 16 of the Committee on Bibliography of T.A.P.P.I.—C.W.J.

K-0; R-2. Paper making materials.—CLARENCE J. WEST. **Paper Trade J.**, lxxi, 25, 26, 1, 2, 3, 4, 5, 6, 7, 8. (Dec. 16—Feb. 17, 1920-1921).—Contribution No. 23 of the Committee on Bibliography of T. A. P. P. I.—C.J.W. (Now available as reprint.—Ed.)

K-0. Soles of Paper, etc.—Br. patent No. 123,166, S. ABRAHAM, England. **Chimie & Industrie,** iv, 668 (Nov. 1920).—Soles composed of a layer of paper, cardboard, powdered cork, and sawdust, covered with a waterproof fabric both sides of which have been coated with an adhesive solution consisting of naptha, para rubber, boric acid, powdered alum, and alcohol soluble color.—A.P.-C.

K-0. Artificial Leather.—Br. patent No. 141,385, G. MILLER, Meopham, Kent, England, June 9, 1920. Chem. Met. Eng., xxiii, 349 (Aug. 25, 1920).—Artificial leather is made from paper, alone or combined with a textile fabric, by treating with a vegetable glue such as is obtained from bananas, or from the farina of **Cloocasia esculadium,** mixed with water containing 25 percent glycerin, with or without the addition of isinglass, casein, gum damar or other agglutinant. The material is then air-dried and may be dyed. The material so treated may be waterproofed with a mixture containing a vegetable wax such as carnauba, mixed, for example, with paraffin wax and turpentine. Several sheets may be superimposed, and the material may be finished to give it the appearance of ordinary leather.—A.P.-C.

L-5. Thickening Fabrics Made from Paper Threads.—Ger. patent No. 301,561, P. RAWITSCHER, Germany. **Chimie & Industrie**, iv, 669 (Nov. 1920).—The finished fabric is subjected to a prolonged cooking. The threads are permanently swollen.—A.P.C.

L-7. Precipitation and Purification of Artificial Silk Solutions. Ger. patent No. 324,334, A. THILMANY, Sept. 14, 1919. **J. Soc. Chem. Ind.**, xxxix, 788A (Dec. 15, 1920). Acidified water or a weak salt solution is sprayed into a bath of the usual precipitating solutions through nozzles, which are fixed between two electrodes. The precipitated or superficially coagulated fibers are thus hardened and purified.—A.P.-C.

L-7. Bath for Spinning Threads from Viscose. Ger. patent No. 324,433, J. C. HARTOGS, March 1, 1914. **J. Soc. Chem. Ind.**, xxxix, 778A (Dec. 15, 1920). The bath consists of a dilute solution of sulphuric acid containing not less than 7 per cent H_2SO_4, to which two or more soluble sulphates are added in such quantities that not less than five equivalents of SO_4 ions are present for every three equivalents of H ions. A suitable solution for viscose which has been kept 7 to 8 days consists of Na_2SO_4 sixteen parts, $MgSO_47H_2O$ thirty parts, H_2SO_4 nine parts, and water forty-five parts.—A.P.-C.

L-7. Artificial Threads.—Br. patent No. 141,041, Glanzfaden Akt.—Ges., Petersdorf in Riesengebirge, Germany, June 2, 1920. **Chem. Met. Eng.**, xxiii, 300 Aug. 18, 1920).—To obtain very fine threads from viscose by the drawing out process, the viscose used is prepared from a "very weak hydrated cellulose", and the original relatively-thick threads are stretched, while undergoing coagulation, in a slowly acting precipitating liquid, such as 1 percent H_2SO_4 solution.

After leaving the coagulating bath, the threads are wound on reels revolving in a 2 to 4 percent H_2SO_4 solution, by which they are finally hardened.

L-7. Precipitating Bath for Artificial Threads. Br. patent No. 147,416, ZELLSTOFFFABRIK WALDHOF and V. HOTTENROTH, Mannheim, Germany, Oct. 6, 1920. **Chem. Met. Eng.,** xxiii, 1181 (Dec. 15, 1920). A precipitating bath for artificial threads, etc., more particularly of viscose, consists of the crude mixture of carbohydrates, etc., obtained on hydrolyzing wood or other cellulose-containing materials with mineral acid; the acid in the bath may be partly or completely neutralized, and other reagents such as ammonium sulphate, solium bisulphate, formic acid, lactic acid, and alum, may be added. In an example, sawdust is kneaded with 80 per cent sulphuric acid, left to stand, diluted with water, and the mixture heated; the hydrolyzed mass is concentrated, partly neutralized, filtered and treated as above, or it may be completely neutralized and concentrated to a syrup or to crystallization.—A. P.-C.

N-7. U. S. Water-Power Commission regulations. Paper, 9-10, (Sept. 29, 1920). A brief outline of the regulations governing the procedure for obtaining licenses for water-power development operations under the recently passed Federal Water-Power Act. —A.P.-C.

N-7. Unused energy of the United States.—Water-power resources and development. The Guaranty Trust Co. Paper, 23-4, 30, (Sept. 15, 1920). An analysis of the estimated total water-power and the developed water-power of the U. S. and the advantages of water over fuel as a source of mechanical energy, together with a discussion of the recent Water-Power Act. —A.P.-C.

O-3.—Operation of the hot-process water softener. GEORGE H. GIBSON. Chem. Met. Eng., **22**, 899-902, (May 12, 1920); Paper, 14-8, (Sept. 8, 1920), 25, 32 (Sept. 15, 1920). The Sorge-Cochrane Hot-Process Water Softener performs the functions of water softener and at the same time of open feed-water heater. The advantages of softening water hot instead of cold are: much greater speed of reaction between the softening chemicals and the incrusting solids of the water; increased size of pptd. particles and decreased viscosity and density of the water, resulting in a quicker sedimentation. Analyses are given showing that in a com. installation the softener had reduced the total solids from 40.72 to 23.95 gr. per (U.S.) gal. and the incrusting solids from 31.48 to 1.65 gr. per (U.S.) gal. The mechanical features of the app. are described, particularly the chemical proportioner used to regulate the feed of chemicals in proportion to the flow of raw water and the sand filter for filtering off the pptd. scale-forming ingredients of the water.

P-2. Pulp and Paper School of the University of Maine. CHARLES A. BRAUTLECHT. Paper, 21, 25, 44, 46, (Sept. 22, 1920). A description of the purpose and scope of the Maine Pulp & Paper School with a list of the subjects taught in each yr. of the course.—A.P.-C.

R-2. Hstory of papermaking in the United States.—MAUDE V. DICKINSON. **Paper Trade J.,** lxxi, 21 (Nov. 18, 1920).—Contribution No. 20 of the Committee on Bibliography, of T. A. P. P. I.—C.J.W.

R-2. Textile fibers and cellulose in Brazil. M. PIE CORREA. **Paper Trade Journal,** lxxii, 2 (Jan. 6, 1921). This is a review of a book, **Fibras texteis e cellulose,** issued by Minister of Agriculture, Industry and Commerce, Rio de Janeiro, 1919. The most important fibrous plants are Piteira gigantea (**Fourcroy-agigantea**) and jute (**corchorus capsularis**).—C.J.W.

R-2. Paper research literature, vii.—A list of the contributions by members of the Bureau of Standards, Department of Commerce.—Compiled by F. A. Curtis. **Paper Trade J.,** lxxi, 19 (Nov. 4, 1920).—Contribution No. 18 of the Committee on Bibliography of T. A. P. P. I.—C.J.W.

R-2. Paper research literature. vi.—A list of contributions of the staff of Koniglisches Materialprufung-samt zu Berlin. Compiled by WILLIAM HERZBERG. Translated and augmented by CLARENCE J. WEST. —**Paper Trade J.,** lxxii, 17 (Oct. 21, 1920); 18 (Oct. 28, 1920). Contribution no. 17 of the Committee on Bibliography, of T.A.P.P.I.—C.J.W.

R-2. A rare book on papermaking. DARD HUNTER. Paper, 16-8, (Sept. 15, 1920). A description of Dr. Scheffer's book on papermaking (published 1765-1771) which is printed on 81 specimens of papers made from every form of vegetation that the author could reduce to pulp.—A.P.-C.

R-4. Standard paper sample books mean economy and profit. Paper, 10, 34, (July 28, 1920). A plea for a standardized size for paper mfrs.' sample books, so that they may be most handily filed for instant and continuous reference.—A.P.-C.

R-5. The Situation of paper.—H. H. REYNOLDS. **U. S. Paper Maker,** lxii, 24 (Nov. 15, 1920).—A careful analysis of the paper situation and the elements which enter into the cost of paper and their probable effect upon the cost of paper for 1921. It should be read by all manufacturers and consumers of paper.—C.J.W.

R-5. Paper exports to Argentina. Paper, 21-2, (Sept. 8, 1920). An analysis of the paper import trade of Argentina before the War and of the present opportunities in that field.—A.P.-C.

R-5. Paper production and consumption for the year 1921. GEORGE OLMSTEAD. **U. S. Paper Maker,** lxii, 9, (Nov. 15, 1920). It is estimated that 1920-1921 will see the installation in the United States of 100 new papermaking machines, producing about 4,800 tons per 24 hours, or nearly 1,500,000 tons yearly. This is an increased capacity of 25 per cent for book paper, 33 per cent. for boards and 7 per cent for writings. The question of consumption is discussed from the standpoint of the advertising, which, as related to paper, is over $1,000,000,000 annually. Nineteen twenty-one advertising will be at least 10 percent more than for 1920.—C.J.W.

R-7. Careful systematic plan for industrial relations. Paper, 20, 32, (Sept. 22, 1920). Methods and features employed by the Spanish River Pulp & Paper Mills to establish sound relations between the company and its employees.—A.P.-C.

R-11. Activities of the Forest Products Laboratory. D. CLARK EVEREST. **U. S. Paper Maker,** lxii, 24 (Nov. 15, 1920). A statement is made of the problems which have been solved or which are now engaging the attention of the laboratory. One of the most interesting and important is the question of the storage of woodpulp and pulp wood.—C.J.W.

R-12. Cost system and the executive. — B. A. FRANKLIN. **U. S. Paper Maker,** lxii, 1 (Dec. 1, 1920).—C.J.W.

PULP AND PAPER NEWS

Union workers in paper and pulp mills of the United States and Canada have voted to reject the 30 per cent. wage reduction proposed by the manufacturers for May 11. Local unions have been instructed "that should satisfactory terms of settlement not be forthcoming from the paper manufacturers between now and the time of the expiration of existing agreements, work will automatically cease in the mills of six companies upon May 1, and thirteen companies upon May 11." Should the walk-out occur, labor leaders assert approximately twenty five thousand workers will be affected and fifty mills of 19 companies tied up. These mills, they claim, produce about two-thirds of the paper stock consumed in this country, having a daily output of 3,600 tons of newsprint and 1,500 tons of finer paper for job printing. Conferences between union representatives and manufacturers have been in progress since last February. The pulp and sulphite workers originally sought for a 10 per cent. wage increase and the paper makers for a five per cent. increase.

Mills countered with proposals for a new agreement providing for a nine hour day; discontinuance of overtime; 30 per cent. wage reduction; and allowance for a readjustment of these scales upon notice of either party up to May 15, 1922.

Two weeks ago union representatives formally notified manufacturers that they could not accept their proposals, but agreed to submit the matter to a referendum. The vote was taken last Sunday by local unions.

A big drop in the price of newsprint in the British market was predicted by Lord Beaverbrook, publisher of the Daily Express, in an address before a gathering of newspaper proprietors last evening. At present, he said, many British newspaper proprietors ware paying 8d per pound for newsprint, though it was now obtainable in the open market for 2¾d. This indicated abnormal conditions in the trade, which could not continue. After referring to the results of his investigations into the productive possibilities of various countries, Lord Beaverbrook said that he felt no hesitation whatever in declaring that "the fall in the price of newsprint would go very far." This declaration of Lord Beaverbrook's is in rather singular contrast with a statement made by him when he said that "The statement that the manufacturing industry is selling here below cost price is perfectly true."

For the last twelve months he has been making statements on this question. As proprietor of the London Daily Express and other publications, he, no doubt, has his reasons for the line he is taking on the matter. One might have thought that his former connection with the Royal Securities Corporation would have inclined him, on sentimental grounds, to more friendliness to the pulp and paper industry in Canada. But it is possible that sentiment does not bulk very big in his make-up. Anyhow, when people realize the lengths to which he is seemingly prepared to go, in his efforts to reduce the price of newsprint, they may possibly be a little more conservative in the attention they pay to such statements.

Mr. G. F. Steele, general manager of the Canadian Export Company, who has been across to Europe will return to Montreal, via New York, on the 1st May.

Some meetings of the pulp and paper industry will be held in Montreal today (Thursday) and Friday. Among those who will be in Montreal for such meetings are Messrs P. B. Wilson, of the Spanish River Pulp and Paper Mills, George McKee of the Donnacona Paper Company, F. J. Campbell, of the Canada Paper Company, John F. Taylor, of the E. B. Eddy Company, H. Biermans, of the Belgo-Canadian Pulp and Paper Company, George Chahoon, Jr., and E. L. Crooker, of the Laurentide Company and T. J. Thomas, J. B. McGibbon, of J. R. Booth, Ltd., H. F. E. Kent, of Kinleith Paper Mills, and I. H. Weldon, of the Provincial Paper Mills.

As to present conditions in the pulp and paper industry, talks on the subject with more than one recognized authority in Montreal can be briefly summarized as follows: The newsprint industry while not running at 100 per cent, capacity, is yet showing distinct signs of revival. Writing paper shows a fair business. In regard to the writing paper situation, informed opinion takes the view that one of the two reasons why business is not better in this line is that printers are "pooling" their stocks; jobbers, who are not getting much business, are doing the same thing, and, as a consequence, the mills are not getting the orders that they ought to get. The danger of such a state of things is that, when buying does seriously begin, everybody will be buying all grades at once, and thus will result in strong artificial stimulus which, in itself, is not the best thing for an industry. The wrapping paper market shows quite a definite revival in the United States, and there are clear indications that the same condition is obtaining in this country. With respect to the pulp situation, it looks as though every mill in the United States and Canada was using up every pound of high-priced pulp it has on hand before ordering more. As has happened on previous occasions, the paper mills will go into their improved markets with bare stockyards. This, in turn, will lead to increased briskness in the pulp situation at the return of normal conditions.

Mr. E. Beck, in charge of the publicity department of the Canadian Pulp and Paper Association, is sailing next Monday by the Droltningholm for Stockholm. Going with Mr. Beck, who is making a special study of forestry conditions in Scandinavia, are Messrs. Gustave Piché, chief forester of Quebec, and E. J. Zavitz, chief forester of Ontario. Mr. Beck's object in making the journey is to obtain information, which should be of high value to the industry in Canada, with regard to forestry methods, and particularly reforestation, in Scandinavia. He will have the advantage of traveling under the guidance of some of the leading Scandinavian forestry experts, and thus will be able to see much that is not usually shown to the outside public.

The organization meeting of the newly-inaugurated Paper Club, the genesis and objects of which were explained in these columns a couple of weeks ago, the by-laws of the Club were duly adopted. Mr. E. T. Reynolds was elected president and Mr. H. E. Bell vice-president and the following were elected as the executive committee: Messrs. S. Rodier, R. M. MacLean, and P. S. Burns. The following are the members of the Club: Messrs. E. T. Reynolds, L. C. Selby and Armand Gauthier, of McFarlane, Son and Hodgson; C. Jodoin, of La Cie de Papier Rolland; A. W. Bell, S. Rodier, A. Villeneuve, R. H. Ecclestone and J. L. Seguin, of the Rolland Paper Company, Ltd.; H. Larkin, J. A. Ireland, T. M. Hubley, J. Labelle, L. Cuibord, L. N. Veilleux, and J. B. Larkin, of the Federal Paper Company, Ltd.; J. Home and J. B. Commie, of the Beveridge Paper Company Ltd.; J. R. Matheson and J. Burns, of the Havill Paper Company; A. F. Winn and D. McCallum, of the Canada Paper Company, Ltd.; J. M. Hampshire, E. S. Wright, J. H. Harnott, H. E. Bell, and A. J. Langelier, of the E. B. Eddy Company, Ltd.; R. M. Maclean, R. B. Hale, A. S. Ginger, T. McDermott, R. G. Rodier, and W. H. Aird, of the Howard Smith Paper Mills; M. A. Reid, of Barber-Ellis, Ltd.; W. R. Currie, of the Dominion Paper Company; P. S. Burns, L. E. Toupin and Dyer, of W. V. Dawson, Ltd.; and S. W. Ewing of Victoria Paper and Twine Company.

With the rapid melting of the snow earlier in the month, power conditions are again normal in Northern Ontario. The Abitibi Company will not be affected by another period of low water, because their big storage dam is now almost complete.

The Queen City Paper and Twine Company, Limited, has been organized and been granted a charter by the Ontario Provincial Secretary's Department, authorizing the company to manufacture and deal in paper and twine and allied products. The company is capitalized at $40,000 and the head office is at Toronto with the following provisional directors: Joseph Bochnek, Morris Oelbaum and Hyman Siegel.

The David Publishing Company, Limited, has been granted incorporation by the Dominion Government with power to carry on business as general newspaper proprietors, publishers, etc. The capital stock is $50,000 and the head office is Montreal.

A directors' meeting of the Spanish River Pulp and Paper Mills, Limited, and the Fort William Pulp and Paper Company, Limited, was held in Toronto last week. Among those in attendance were W. L. Bird, manager of the Fort William Pulp and Paper Company, Limited: George H. Mead, of Dayton, Ohio: C. E. Read, of the Hull Lumber Company, Ottawa: Col. Jones and George Gray of the Spanish River Pulp Company. It was learned that the Fort William Pulp and Paper Company hopes to be grinding wood at its new plant in Fort William by the end of the month. Mr. Norris, vice-president of the Montreal Heat and Power Co. was also present at the meeting.

John Hewitt, of the Paper Sales Company, Yonge Street, Toronto, was greeted by many friends in the paper trade on his return from North Carolina where he spent several weeks regaining his health which had suffered through too close application to business. His many friends were pleased to note his old time vigor after an enjoyable outing.

The high water mark of efficiency was attained on April 7th when the employees of the Abitibi Power and Paper Company at Iroquois Falls turned out 265 tons of newsprint paper in one day on four machines, constituting 96.9 per cent efficiency. No. 5 machine, which is 160 inches wide, was recently installed in 28 days.

WAGE CONFERENCE OF PAPER MANUFACTURING COMPANIES.

New York, April 25. — Paper manufacturers, who met here today, continued in their stand that wages in their mills should be lowered, and made no change in the plan rejected recently by the various labor unions having membership in their factories.

The undersigned Paper Manufacturing Companies, at the request of the Brotherhood of Paper Makers and Brotherhood of Pulp, Sulphite & Paper Mill Workers, expressed through invitation of their International Presidents, have been acting together in an effort to arrive at mutually satisfactory adjustments of wage rates and working conditions to take the place of those provided for by the Trade Agreements which exist between each of such manufacturers and the labour unions named, with the object of avoiding any interruptions of operation in their manufacturing business when such agreements expire on May 1st and May 11th.

A preliminary meeting was held on February 24th, and a meeting attended by all of them on March 30th at which time the manufacturers present agreed on proposals to be made to the labour unions on the subject of wages and working conditions such as the present business situation in the paper industry warrants, due consideration being given to industrial and economic conditions as well as living costs.

A committee of manufacturers presented said proposals to the labor unions who had invited the joint action. The Committee reported to the full meeting of manufacturers April 20th, that the proposals made were rejected by the labor unions and that no definite counter proposition has been made by them.

"The action taken by the employees concerned," said a statement issued after the meeting, "is regretted by the manufacturers as each of them is desirous of operating his plant to the largest possible extent, thereby furnishing as much employment as is possible to the employees and paying rates of wages compatible therewith which are represented in the proposition submitted to the labor unions and rejected by them."

Manufacturers said tonight, however, that negotiations would be continued with the unions, and it was hoped the employees' representatives would submit some proposal to the employers.

The following paper companies were represented at the meeting:—Minnesota and Ontario Paper Company; Fort Frances Paper Company; Grand Lakes Company, Spanish River Pulp and Paper Company; Cliff Paper Company; Pettebone Cataract Paper Company; Hannah Paper Company— St. Regis Paper Company; International Paper Company, and the Union Bag and Paper Company.

"For want of a nail the shoe was lost,
For want of a shoe the horse was lost;
For want of a horse the man was lost;
For want of a man the battle was lost;
And all for want of a nail."
Poor Richard (Benj. Franklin.)

PAPER MACHINE BUILDING IN CANADA A NOTABLE ACHIEVEMENT.

With the completion of the two mammoth fast running newsprint, machines for the Laurentide Company Limited, of Grand Mere, the Dominion Engineering Works, Limited of Montreal have stepped right into the fore front of modern paper machine builders. In the successful building of two 166 inch machines, which are acknowledged to be the very last work in modern machine design and construction, with a new organization, and in a plant not previously used for this class of work, they have accomplished what many well informed people held to be an impossibility.

The achievement is all the more notable when it is considered that both machines were designed, constructed, installed and placed in successful operation in a little over one year. Much credit is due to the Laurentide Company for the happy position occupied by the Dominion Engineering Works as the first builders of complete paper machines in Canada, first for their courage in placing such an important contract with an untried organization, and second for the help and cordial cooperation of their engineering and operating staffs in the design and construction of the machines. A number of novel features are embodied in the design and construction of these machines, as will appear from the following brief description:—

The wire part of fourdrinier is built without "shake" for a wire 166″ wide, by 103′-6″ long, and is arranged with a downward pitch of 30″ from breast roll to couch roll. The usual fourdrinier rail construction is eliminated, and the breast, table, and wire carrying rolls are supported on a rigid cast iron frame. This frame is built in sections, each of which is strongly braced across the machine, and forms a unit in itself. Each of these sections carries its quota of table and wire rolls, and is designed so that it may be moved out to the centre aisle of the machine room on special ball bearing trucks without disturbing the table or other rolls when changing a wire. All of the table rolls, wire rolls, and breast rolls are mounted in S.K.F. ball bearings of the latest enclosed type.

The couch roll is of the Millspaugh patented suction type, 30″ diameter, which is the largest roll of this type ever constructed. There are four sets of press rolls, of which the first is a Millspaugh suction press, and the other three sets are of standard type with bottom rolls rubber covered, and top rolls of polished granite. The press part presents a rather novel arrangements of felts, which are arranged in vertical loops, extending down into the basement, where are located the automatic take-ups; the absence of the usual top hamper of felt loops gives the machine a rather unusual appearance, besides adding to the convenience of the operators.

The paper is passed from the suction couch roll and through the presses by means of compressed air jets, thus entirely eliminating the passing of the paper by hand, and making possible much higher speeds than could be reached by the old methods.

The dryer part consists of a small leading dryer, and forty 72″ main dryers, arranged in two tiers, the bottom tier being mounted in ring-oiling bearings which are carried directly on the machine base plates. The usual arrangement of dryer felts is used with all felt rolls carried in ring-oiling bearings of the most improved design. The paper is automatically passed through the dryers by means of a "Sheahan" patented rope carrier, and from the last dryer to the calender by means of a specially arranged series of air jets. The calender is of the usual design with bottom roll 30″

(Continued on page 466)



Laurentide's No. 8, and No. 9 Paper Machines— Model Machines in a Model Machine Room.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, April 23.—Generally speaking the pulp and paper situation remains unchanged and although in a few lines of paper there are signs of a brightening up in trade, according to the statement of one big mill man, business on the whole is quiet. The general concensus of opinion is that pulp and paper industry can hardly be expected to recover anything like its old-time vigor until Canadian business conditions generally improve, and that is not looked for much before the coming fall, although there are those who take the view that considerably freer buying is bound to set in before then by reason of the fast diminishing stocks. Labor troubles, both among paper mill workers and printers, are in the offing and these are liable to further accentuate the unsettled conditions of the trade, although in the long run, a shut down of any of the mills in Canada or the United States by reason of a possible strike, is looked upon as possessing a certain advantage from a trade standpoint, for it would probably mean that the surplus of paper will be greatly reduced if not entirely consumed and thus placing the newsprint mills in a stronger position as regards market demands and prices. Of course earnings would be reduced by those mills which would close, but curtailment of production for a month or more might produce favorable results. It will be recalled that the pulp and paper unions demanded an increase in wages, and so far from agreeing to this mill owners, whose mills are unionized decided to bring into effect a cut of 30 per cent in wages on May 1st. Whether the contending forces will clash in a strike is yet to be seen but is is considered within the range of possibilities. It is reported in some quarters that the men may be willing to accept a cut of from 20 to 25 per cent but no decision has been reached on this point. The two chief union mills in Canada are the Spanish River and Abitibi, while Laurentide, Price Bros., Brompton, Donnacona and others are among the "open shops." In some of the mills cuts in wages, it is stated, have already taken place and others will likely fall into line but the test will come when the wage agreements come up for signature on May 1st.

In the meantime the Canadian paper industry is facing ever increasing competition from European countries in the United States market as indicated by the fact that during February last, Canadian mills sent to the United States a total of 97,788,183 pounds of print paper, valued at over six million dollars. This was a decline of three-quarters of a million dollars in business as compared with the previous month. It is also pointed out that both Belgium and Germany are beginning to send paper to the United States market. The figures are interesting as showing the somewhat altered condition of the position of the Canadian mills during the present year, although there is no fear but that the Canadian output of paper will always find an outlet. The industry on the whole is healthy and temporary adverse trade conditions are only partially interfering with expansion plans. For instance it is practically assured that a large pulp mill will be constructed on the shore of Lake Temiskaming, two miles north of Haileybury, the township council now considering the matter of a fixed assessment for the promoters of the enterprise and the matter of the use of the required water frontage already having been arranged with the Dominion Government. The company is known as the Temiskaming Pulp and Paper Company, Limited, and is capitalized at $500,000, with head office at present in Toronto. It is proposed to construct a 40-ton groundwood mill, the engineers being Messrs. Viele, Blackwell & Buck, 49 Wall Street, New York. Ontario and American capital is involved in the enterprise. According to the agreement between the company and Buck Township, the buildings are to be completed early next year.

The company will have fifty square miles of limits along the River Quinze in the Lake Expanse district, Quebec, on which there are 260,000 cords of pulpwood, which will be brought across Lake Temiskaming by boat. Alex. Faskin, the well known Toronto lawyer and pulp and paper company promoter, is president of the new company and C. C. Calvin, secretary-treasurer. (These figures would give 8 cords per acre—rather rosy!—but even so, would provide wood for only 20 years.—Ed.)

THE RIORDON SLUMP.—In Toronto pulp and paper circles the event of the week was the sensational drop of the Riordon paper stock. The general consensus of opinion among the brokers and others appeared to be that the firm would pull through. One broker put it this way: "There was an untimeliness in the break in paper which caught the papermakers of Canada in between seasons. They had laudably put a great deal of money into perfecting and extending their mills, when they had lots of money, and then ran into depression and are, unfortunately, now short of cash. The paper industry is fundamental in Canada and cannot but come out allright in the end. Of course, if you get too far extended you can embarrass any industry in the world."

PAPER TRADE JUMPY.—A slight improvement in some lines of the paper trade has been noted during the week although business generally is dull and somewhat spasmodic. In most lines business comes in fits and starts and orders in various lines, such as book and writings, wrappings and light papers, are for the most part of small proportions. On the other hand an Ontario mill making light weight papers received an order last week for three carloads of their product. One Canadian mill with head office in Toronto reports their mills quite busy, chiefly on book paper for the publishers and are runing close to full time. There is little business doing in either chemical or mechanical pulp and the mills have large stocks on hand which they are having difficulty in disposing of. Some transactions are taking place but there is no set market price for pulp. Nominal quotations on ground wood are from $35 to $45: easy bleaching sulphite $95.00 to $100: news grade sulphite $65.00 to $75.00: bleached sulphite $125.00 to $130.00 and sulphite around $80.

BOARDS ARE DOWN.—The week saw a drop of

ten dollars a ton in several lines of board. Straw board dropped from $60 to $50: chip board from $60 to $50 and chip vat-lined from $75 to $65 a ton. Business in this line of paper product is still very quiet and dealers report that there are more orders to be had outside Toronto than inside the city.

NEW YORK MARKETS.

New York, April 23.—(Special Correspondence.)—Although the general paper market situation has undergone little notable change this week, most of the reports emanating from manufacturing and distributing centres have been of rather encouraging character. Judging from these advices, business in at least some lines of paper is at last on the mend. There is a lack of concerted movement of any one grade, yet it would appear that demand is commencing to improve, and everything would seem to point to the industry having experienced the worst and that from now on matters will gradually become more favorable.

Consumers are still buying only when necessity compels them to, and there is nowhere near a normal movement of paper of any kind for the principal reason that consumption does not begin to approximate that of more ordinary periods. Nevertheless, it can be said that the market is sprucing up a bit and that buyers are steadily evincing increased interest, indicating that their requirements either are broadening or else display some signs of increasing. A consensus of opinion among paper men is that the market is unlikely to become fully stabilized or that demand will reach anything approaching normal before the autumn, but there is a common feeling that business during the coming summer will certainly be better than it has been within the past few months. Certain lines of industry are getting livelier each day, which is bound to be reflected in the paper trade in short order, because there are few industries which do not use paper of some description.

Present indications are that a strike of newsprint and sulphite mill workers will be declared during the next several weeks. Locals of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers have voted almost unanimously to reject the 30 per cent reduction in wages and an increase in hours of from eight to nine a day offered them by paper manufacturers on April 8, and a strike seems inevitable, to become effective partially on May 1 and completely on May 11, unless an agreement is reached in the interim. Newsprint manufacturers appear determined to press their proposal, whereas the union leaders seem just as determined to oppose the new wage and working schedules.

It is understood that newsprint producers already have begun to make ready for the threatened strike and that they are operating their mills at capacity in an effort to store up as large a surplus of their product as possible to tide them over a strike period should the strike occur. Paper men cannot comprehend how the union leaders can call a strike at this time. It is openly conceded that there is sufficient newsprint in the hands of publishers and producers to fill the needs of publishers at the prevailing rate of consumption for quite a lengthy period, and it is also felt that labor conditions are such as to make the present a most inopportune time for a strike.

The newsprint market has been little affected by the talk of a strike. There are fairly large amounts on offer; more, in fact, than publishers seem to want, and most of the spot sales being made are at low prices. Contract quotations are maintained, but a majority of transactions in the spot market are at no more than 4.50 cents per pound for newsprint in standard rolls.

The book paper situation is little changed. Demand is limited and yet, if anything, orders are increasing in volume rather than declining. Mills are not busy — few of them are running at anywhere near capacity — and this of course keeps prices in an easy position. Some grades of fine papers, chiefly the cheaper-priced lines, are moving in better quantity, and mills are gradually but slowly enlarging their production. Wrappings are quiet and demand for fine tissues has improved but slightly, if at all, although coarse tissues such as toilet paper, napkins and towels, are in comparatively active call. Reports received several days ago say that one of the largest producing mills in the country, situated in the vicinity of Philadelphia, of this class of paper is running at full capacity and is finding an outlet for practically all of its output.

Boards are still sought in hand-to-mouth quantities and prices are irregular and on low levels. A majority of manufacturers in the East are quoting $35 a ton on plain chip and $40 on filled news board f.o.b. mills, but there are several who are accepting orders at substantially under these figures. Board makers are in a bad way for want of business and are operating at greatly curtailed schedule.

GROUND WOOD — Quotations on mechanical wood pulp have sunk to lower levels. Offerings of spruce ground wood of prime quality at $25 per ton f.o.b. grinding mills have been recorded, and in at least one instance an even cheaper price has been quoted, a certain dealer in New York having offered ground wood manufactured in Canada for shipment to the States on schooners at a basis of $22 per ton at the producing plant, figuring out at around $35 to $38 per ton delivered at consuming points in New York State and nearby points in the East. Demand continues very narrow. Consumers are coming into view as buyers only when immediately requiring supplies and then are confining orders to cover pulp sufficient to fill their requirements for a short time. There are some producers who are quoting $30 and $35, and even higher, at mills, but it seems doubtful that they are managing to effect sales at such figures when ground wood is available at so much lower costs.

CHEMICAL PULP.—The chemical wood pulp trade is steadfastly marking time. There is little demand of note coming from consuming quarters, and the scattered transactions recorded off and on scarcely involve enough pulp to establish a market. Prices are irregular, and largely nominal. Buyers invariably are securing wanted supplies at considerable concessions from the prices asked by manufacturers and importers, and so many and varied prices are heard that it becomes very much a matter of guesswork trying to ascertain what really constitute market values. Most domestic producers of bleached sulphite are quoting 6.50 cents a pound for No. 1 bleached, and around 3.50 cents on news grade sulphite, yet such sales as are accomplished are invariably at half a cent a pound under these prices. Quotations on imported pulp now in this country are being fre-



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quently slashed in order to effect sales, and prices on foreign pulps are relatively more unsettled than are those on domestic grades.

RAGS. — Prices on papermaking rags continue on the downtrend and there has been no perceptible expansion of demand. Mills are buying in cautious fashion, almost entirely against direct requirements, and it is problematical at just how low most grades can be obtained. Offerings of No. 1 white shirt cuttings at around 10.50 cents a pound f.o.b. New York have been reported, without attracting buyers, while No. 1 washables are available to mills at 5.25 cents at shipping points, unbleached muslins at 8.25 cents fancy shirt cuttings at 7 cents, black silesias at 3.75 cents and white lawns at 10 cents. Roofing rags have sold down to 85 cents per hundred pounds at dealers' points for No. 1 packing, and No. 2 packing has been bought in some cases at as cheaply as 65 to 70 cents. Old whites are gradually easing off in price, as are old thirds and blues.

PAPER STOCK. — Prices on some grades of old paper have steadied to an extent, this apparently being due not to any important increase in demand but to the prevalence of values on such low levels that producers in a good many cases have stopped putting up material, finding that it is a losing proposition under present prices. There has been a little more inquiry for old books and magazines, and No. 1 packing is bringing 85 to 90 cents per hundred f.o.b. New York, while in the Middle West higher prices are reported to obtain. Shavings are quoted in the vicinity of 3 cents per pound on No. 1 hard white and 2 cents on No. 1 soft white shavings, while old No. 1 kraft paper is said to be attracting more buyers at a quotable range of between 1.35 and 1.50 cents at shipping points. Folded newspapers are freely available to board mills at 35 to 40 cents a hundred and No. 1 mixed papers at 25 cents, and it is the contention of dealers that as soon as demand for these grades shows the least expansion prices will advance.

OLD ROPE AND BAGGING — Old rope is in comparatively good demand from paper mills and No. 1 manila rope is readily fetching around 3.75 cents per pound at producing points, with some reported heard of sales up to 4 cents. Old bagging, on the other hand, continues to be neglected by consumers and is available at very nearly any figure which buyers are willing to offer.

A consideration of petty circumstances is the tomb of great things.

(Continued from page 462)

diameter, and all upper rolls 16" diameter. All calender roll bearings are bronze bushed and ring-oiling.

The reel is of the "Pope" patented surface type, designed for easy changing of reels at high speed. Compressed air is again used to carry the paper from the calender to the reel, thus making the passing of the paper practically automatic from end to end of the machine. A set of unreeling stands and a Warren double drum winder complete the machine, which is almost 300 feet long from breast roll to winder.

The most careful attention has been paid to the lubricating arrangements for all component parts of the machine, also to balance, and rigidity of construction, with a view to continuous operation at 1000 feet per minute.

The machines are both operating successfully at speeds up to 800 feet per minute, and it is only a question of time before they will be reeling off newsprint at 1000 feet, a speed which has been reached.

Both machines are driven by the Harland Engineering Company's electric drive, with patented speed interlock, using individual motors on each unit, there being one motor for the fourdrinier part driving the suction couch roll, one motor for each of the four presses, three motors driving the dryer part, and one motor driving the calender and Pope surface reel.

Installed in a splendidly built and well lighted machine room these mammoth machines present a magnificent appearance that excels anything heretofore built, and form a lasting record that the Dominion Engineering Works, Limited may well be proud of.

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There is no economy in doing without things that cost less labor than their lack occasions.

It is old wisdom, as old as the first man that planted a crop or built a house. But it is hard for us to remember it. It seems so much cheaper to "do without" until prices go down, until exchange is again at par, until—the millenium. Meanwhile we will make shift to use paper not quite good enough for its purpose, to use machinery not quite modern enough, not quite productive enough, and to use labor not quite efficient enough.

Make-shift is the world's chief extravagance.

A little better paper, and the goods are protected; a little faster machinery, and your "overhead" per unit is reduced; an elevating truck, and you save in wages, time, and injury to goods.—The Caravel.

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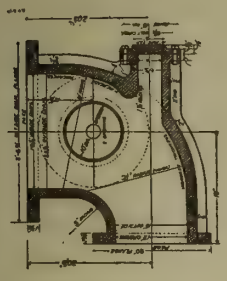
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So sure are we that "World" Bronze will stand up in service that we are casting in each article the trade mark "World" and the words "Date Installed" with a raised portion beneath where the date may be stamped. Thus we give the engineer in charge of your Mill an absolutely correct record of the life in service of each Valve, Fitting or Special Casting manufactured of "World" Bronze

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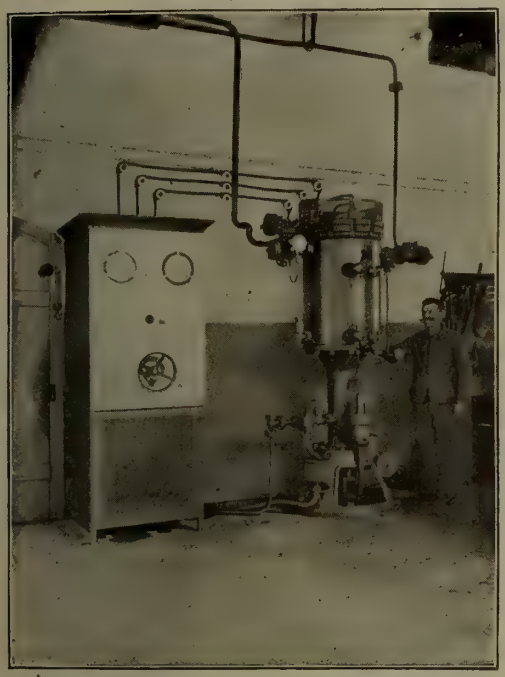
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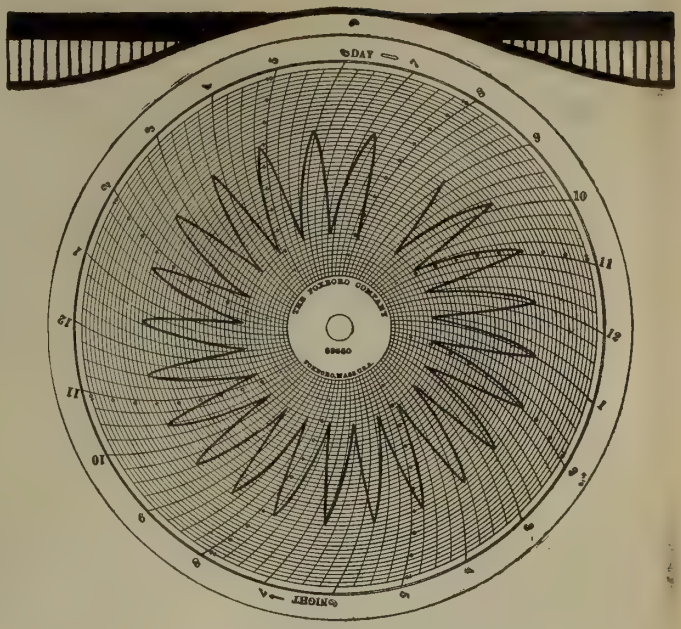
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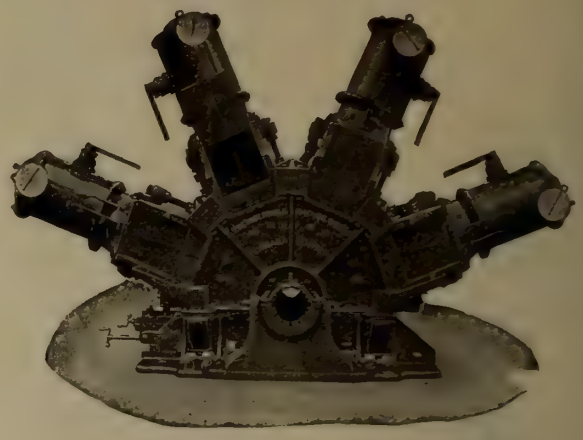
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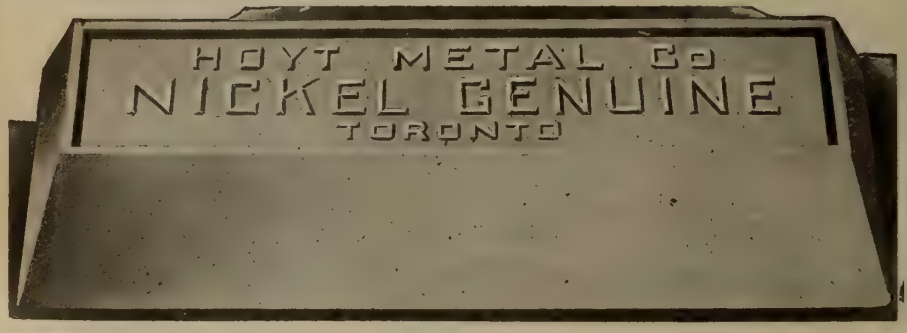
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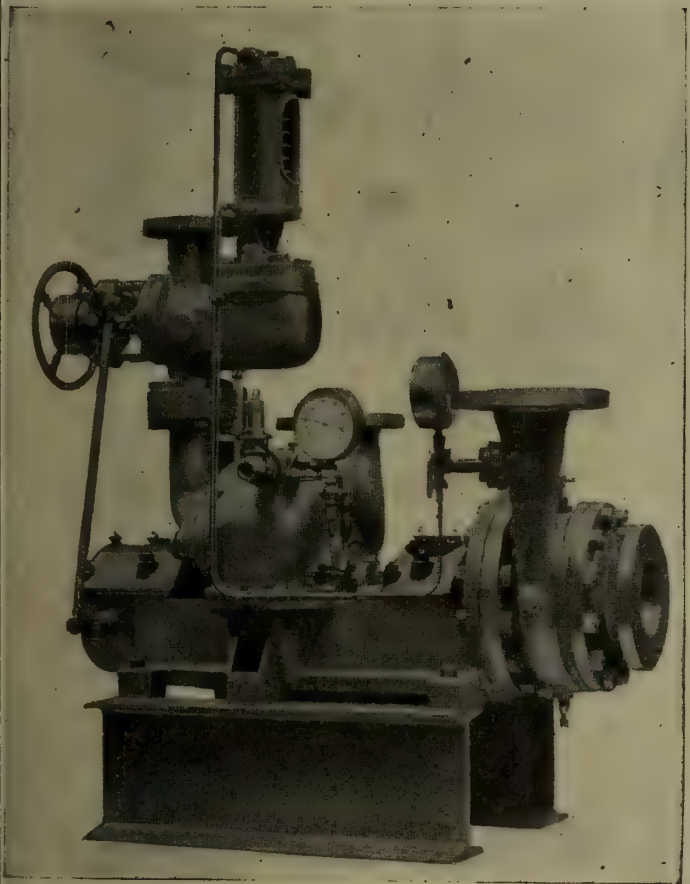


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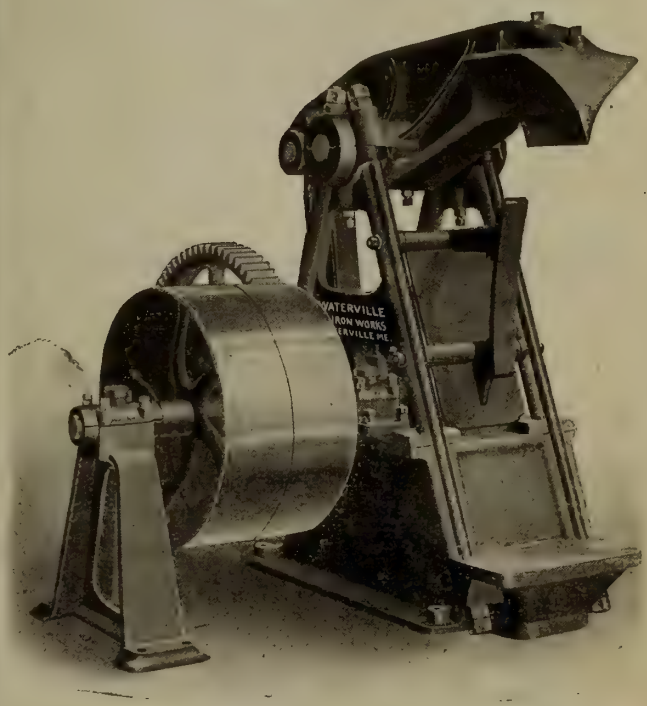
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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., May 5th, 1921. No. 18

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Room 205 Drummond Building, Montreal.
'Phono Uptown 7773.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

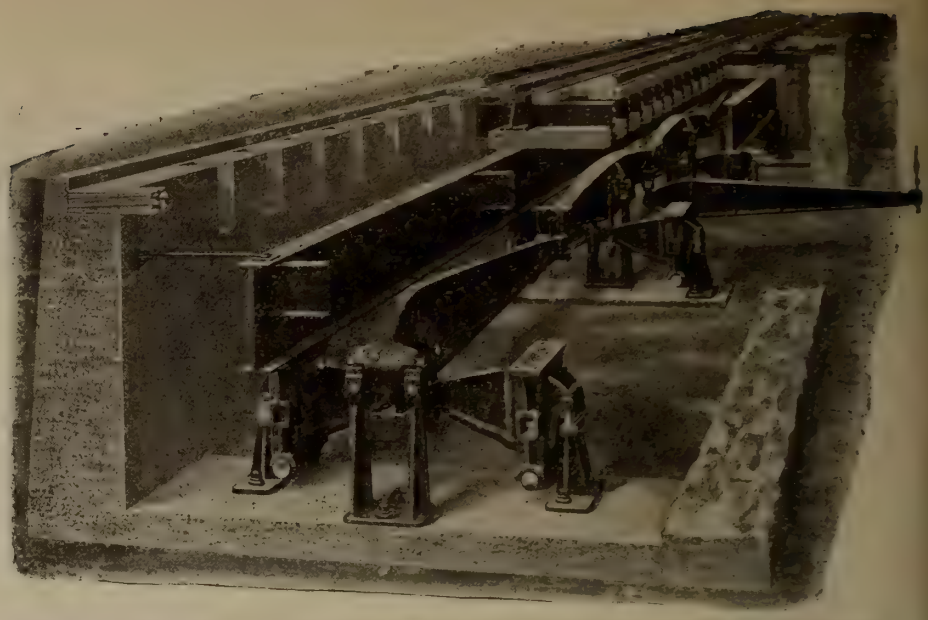
J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

THE RESEARCH INSTITUTE.

Echoes from Ottawa indicate that there is a discussion going on at the Canadian capital with regard to the bill to establish a Federal Research Institute which recently came up in Parliament for the second reading. Sir George Foster, in outlining some of the advantages that might accrue, cited a number of successful experiments which had been carried into commercial operation under the auspices of the Advisory Council for Scientific and Industrial Research. Among these instances was mentioned the digging and drying of peat for fuel by such improved methods as to enable the operation to be done at a profit. Similar success attended the briquetting of Western lignites.

While the Pulp and Paper Industry is naturally most interested in ways in which the Institute can improve methods for using pulp and paper making materials, to discover new ones, and to prevent economic wastes, yet it is well to bear in mind that in establishing the proposed research institute the Government aims not to serve any particular industry but to benefit the whole Canadian people. Of course in improving any methods of manufacture or utilizing the products of our enterprise there is, at least indirectly, a benefit to every Canadian but this is not always realized; consequently it is sometimes difficult for some people to comprehend the value of legislation or action for which does not affect them directly. The instances used by Sir George to show what had been done likewise illustrate the great possibility of scientific research intelligently and diligently appled to almost every line of Canadian activity. The improvement in our agriculture prosperity has been reached by the path of progress marked out by the scientific investigation of a number of the principal factors involved. The selection of seeds for grain suitable to certain soils and climates has placed Canada well to the front as a producer of food stuffs and the scientific selection and breeding of stock is proving its value in the success of Canadian breeders. Scientific research and technical skill converted cobalt, which had become a drug on the market, into an essential ingredient of one of the most remarkable alloy steels. These are but some of the accomplishments of scientific research in Canada.

In the field of pulp and paper much fundamental work has been accomplished. Satisfactory methods of analysis have been devised for ascertaining the cellulose content of wood and analyses of typical woods have been carried out so that we know the maximum paper making fibre obtainable from various types of pulpwood and this together with fibre length measurements and the determination of density of the wood gives us data on which to base a calculation of comparative values for the mill. Investigations have brought out some interesting and important fundamental data with regard to the power used in beating, and the cause of rosin troubles on the paper machine have been traced out. The conditions encouraging the growth of wood destroying fungi have been investigated and some means of remedying it have been discovered. Methods have also been developed for adequate protection of pulpwood from fire and incidently from fungus growth. Coming back to the forest we could mention a number of scientific studies which must eventually prove of enormous value to the wood using industries of this country and this continent.

This record of accomplishment is not altogether to be credited to Government work but much of it has been done at least with the co-operation of Provincial and Federal departments. A much longer list could be recited and even this would be but an indication of the possibilities rather than a boundary of accomplishment. There are still countless problems of a fundamental nature as well as of individual application awaiting solution. Some of them could best be investigated by a central Government institution. Others require the atmosphere and apparatus of a manufacturing plant. All of them will be most successfully and satisfactorily solved by the organization of all facilities for scientific attack. Canada has extensive natural resources which have only been touched, undeveloped water powers hold possibilities for industrial development of untold extent and wealth producing power. Some resources are being exploited rather than developed and if they are to be maintained in a permanently productive condition scientific research must be called in to develop new uses and improve on present conditions.

There is naturally some feeling that certain established departments of limited scope are the only effective organizations for dealing with certain problems but as any success of these smaller units is due to the co-operation of individuals therein, so the larger organization will be successful in such measure as all bodies merged in it will cooperate. A much more effective college course can be arranged by combining a selection of the most appropriate units from several departments of the University than where it is necessary for a few teachers to cover indifferently a variety of subjects. The Research Institute will correspond to the University where there will be gathered the experts

in each line who would correspond in educational work to the authority, say on chemistry, in one college, physics in another, electricity in a third and so on. Furthermore, instead of having either a duplication of high grade apparatus in several places or a distribution of single expensive pieces where it would be exceedingly awkward to make effective use of them, one would have in one place absolutely the best equipment available. The benefit of such organization of personnel and apparatus in these days of organized effort will surely be apparent in anyone who gives intelligent thought to the subject and the establishment of the research institution will have their full support.

AN ASSOCIATION RENDERING REAL SERVICE.

Probably few associations have such a record of constructive suggestive assistance to the industry represented and to the constituency served by that industry as the efforts of the Canadian Pulp and Paper Association in the organized work which is now being carried on. There are plenty of people who are eloquent enough in pointing out conditions that should be remedied but those who can tell how improvement can be effectively accomplished are few. The Pulp and Paper Association is fortunate indeed and the industry is to be congratulated in having the service of men who can devise such helpful suggestions as are coming out from the offices in the Drummond Bldg., Montreal. Take, for instance, the Bulletin No. 2 entitled "Broadsides, The Trail Breakers of Business". Here we have not only a definition of what the broadside is but one of the finest illustrations that can be imagined, of the thing itself; paper, printing, arrangement, and expression, all carrying direct to the user something which carries an idea which cannot help but be grasped and made use of.

Another helpful hint is a circular letter which is so cleverly prepared as to give the impression of a personal communication which it actually becomes by the personal signature of the head of the Association's Publicity Department. This letter on direct advertising tells the printer in plain English, how to improve his own business by employing himself to advertise himself. Such work is not only helpful to the manufacturer of paper but it is helpful to the printer in showing him how to get more business; it is helpful to the merchant and the manufacturer in suggesting more efficient ways of advertising their goods and it is helpful to the consumer in bringing to his attention things that he might not be aware of but which could be used by him for convenience or profit. Finally the campaign encouraging the wider use of Canadian goods by the more extensive use of advertising on Canadian made paper will react favorably on our trade balance with other countries and enable us to purchase such raw material as must be imported and such machinery as it is not at present economical to produce in Canada with less economic penalty because of adverse exchange.

LESSONS FROM THE TRADE REPORT.

On April 30th the External Trade Division of the Dominion Bureau of Statistics sent out from the offices of the Department of Trade and Commerce the table printed on page 474 of this issue setting forth the exports of paper, wood pulp and pulpwood for the past year and figures for comparison with previous years and likewise for the month of March. Some very interesting comparisons are evident. For the month of March miscellaneous grades of paper suffered a decrease in value from $1,200,965 to $667,096 but the total exports of paper for the month increased somewhat over $2,000,000. Wood pulp fell off in value almost 50 per cent., the principal decrease being in unbleached sulphite pulp, while bleached sulphite pulp showed a slight increase. It is interesting to note that pulpwood for the month increased in amount from 48,000 cords to 177,000 and in value from $497,984 to $2,342,495.

With regard to the distribution of paper we find that the United Kingdom took less than 1/3 of the amount reported for March 1920 while the United States took nearly 30 per cent. more and other countries over 100 per cent. more in March 1921 than in March 1920. For the same periods we find that the United Kingdom took less than ¼ as much wood pulp, the United States and other countries each taking about 60 per cent.

Looking at the annual statistics we find a very encouraging growth during the last three years. The total value of pulp and paper making materials exported being $97,956,280 in 1919, $113,091,704 in 1920 and $185,168,938 in 1921, for the year ending with March. We have thus accomplished a growth of nearly 100 per cent. in three years. Without exception the values of all items increased consistently during this period although the quantities of sulphite pulp and unbleached sulphite and groundwood pulp showed a shrinkage which was most marked in the case of groundwood, the quantity of which decreased by about 35 per cent. although the value nearly doubled. The total exports of pulp decreased in quantity about 7 per cent. while the value increased nearly $20,000,000. The distribution of these various products remains relatively the same, the United States being far in the lead in every case, in fact the total value of exports of paper, pulp and pulpwood to our neighbor last year amounted to $151,650,268 of which $21,350,000 represented pulp wood.

Each of the years represented would be considered a satisfactory period and the value of these exports is being more and more appreciated by Canadians. The current fiscal year has yet 11 months to recover from the present depression and if instead of an increase of $72,000,000 as between 1920 and 1921 we experience the more moderate advance of $15,000,000 as between 1919 and 1920 we shall have brought our exports of pulp and paper past the $200,000,000 mark.

Ontario Pulp and Paper Makers' Safety Meeting.

The annual meeting of the Ontario Pulp and Paper Makers' Safety Association was held in Toronto on April 20th, with George Carruthers presiding. Practically all of the pulp and paper mills in the province were represented at the meeting. The president's address and the annual statement of the Safety Engineer A. P. Costigane proved of deep interest and a statement showing receipts and disbursements, signed by P. S. Ross & Son, chartered accountants, were presented and adopted. The following directors were appointed: George Carruthers, C. Nelson Gain, Col. C. H. L. Jones, H. F. E. Kent, L. R. Wilson and P. J. Murer. Following the annual meeting the board of directors met and re-elected George Carruthers president and C. Nelson vice-president.

During the general session the situation as regards accident prevention in the pulp and paper mills was gone into carefully and some suggestions made whereby the educational work being carried on by the association may be made even more efficient. Those present showed great interest in the various steps taken during the year to prevent accidents, and expressed the feeling that, stimulated by the competition that is now going on in the pulp and paper mills for the best accident prevention record during the current year, the results will constitute an even better showing than during 1921. The president's and engineer's statements follow.

THE PRESIDENT'S ADDRESS.

By GEORGE CARRUTHERS, President, Interlake Tissue Mills.

Since being appointed President of the Ontario Pulp and Paper Makers' Safety Association, last year, I have followed closely and with great interest the educational work being carried on in the effort to prevent accidents. I am convinced that the work is very necessary and is worthy of the sincere support of the pulp and paper mills included in the membership of this Association. My own experience of the effect on employees has convinced me that the fact that a company is sincerely interested in the well being of all its people creates a feeling of loyalty which shows up in many little ways during the everyday working of the mill. This feeling of loyalty is one that we should value highly and encourage in every way possible. The majority of the mill managers are sincerely interested in the movement and help largely in carrying on the work. Unfortunately a minority, after four years of effort on the part of this Association, are indifferent and give little or no assistance. This attitude is not fair to our engineer. No matter how sincere the efforts of our engineer may be we cannot look for marked progress unless his efforts are backed by the management. It is not reasonable to expect the men in such mills to believe in a movement, towards which the management shows indifference or veiled hostility. In the face of ever increasing cost of compensation it is hard to conceive the reason for indifference on the part of some of the mills. Looking over the reports issued by the Workmen's Compensation Board I find the cost of compensation for 1918 was $134,397,91. In 1919 the cost increased to $251,057.95. The figures for 1920 are not yet available, but you may be sure the cost will not be less than in 1919. This Association is endeavouring to reduce this tax on our industry by striking at the root cause viz:—accidents, and for this reason we ask for the fullest co-operation on the part of the management of all mills. The accident statistics for the year 1920 show a large increase in comparison with 1919. The actual figures on this head are given on our Engineer's report.

In order to stimulate interest among employees of all mills a competition for the best accident record for the year 1921 has been inaugurated. The mills are divided into two groups, and the prizes take the form of two shields mounted on wooden bases, each trophy being accompanied by a commemoration flag. The shields will be competed for each year, but the flags remain the property of the winners. The interest already shown in this competition is a guarantee of success.

Workmen's Compensation Act.

During the year an amendment has been added to the Act increasing the scale of compensation from 55 p.c. to 66-2/3 p.c. of earnings, with a corresponding increase in pension awards, and I understand an effort will be made in the near future to further increase this scale. Organized opposition on the part of the manufacturers is the only hope of preventing the scale of compensation reaching 100 p.c.

The merit rating system of assessment is still in operation. Under this system each firm's assessment is regulated by the cost of their own accidents. Companies with a good accident record receive a merit rebate, whereas companies whose accidents during the year cost more than the estimated amount are called on to pay a supplementary assessment. During the year 1920, on account of the year 1919, merit refunds numbered 10 amounting to $2,912.27, and the demerit charges numbered 14 amounting to $19,142.24.

Finance.

The audited statement of receipts and disbursements, copies of which are available, shows the cost of running the Association during the year amounted to $4,964.55 as compared with $4,000.81 for the year 1919. The figure for 1920 includes an item of $232.90 for office furniture.

SECRETARY & ENGINEER'S REPORT.

By A. P. COSTIGANE.

The work of accident prevention during the year 1920 has been carried on as vigorously as heretofore, but the results are disappointing as compared with the previous three years. Both the number and severity of accidents during the period under review show a marked increase. It is difficult to account for this result, as the interest and co-operation of both employers and employees is as keen if not keener than ever before; still accidents are on the increase. There is nothing tangible to account for the increase, but possibly the payment by the Workmen's Compensation Board of medical fees and an increased scale of compensation has led to the reporting of accidents that in previous years passed unnoticed. This, however, does not account for the deplorable increase in fatal accidents.

Employees' Safety Meetings.

Educational activity by means of showing special

safety films had to be abandoned last year owing to the impossibility of importing suitable films from the United States due to the embargo on express traffic. Meetings of Safety Committees were held at various points, but no general meeting of employees such as were held during 1919 was convened during 1920 owing to reason already stated. During the current year if suitable films can be secured an effort will be made to organize meetings along the same lines as those that proved so successful during 1919.

Safety Calendar.

The 1921 Safety Calendar produced during 1920 was faborably received. From information gleaned since the calendar was distributed there is no room for doubt that this method of education is appreciated by the employees and is of great service in keeping accident prevention to the fore day in and day out during the whole year. A calendar for 1922 is now being prepared and it is probable that the price of paper and printing etc. will permit of a reduction in price.

During the year the following meetings and conventions were attended by your Engineer:

(1) Annual meeting of the Canadian Pulp & Paper Assoc. and Technical Section.

(2) Meetings of Committee on Education, T.A.P.P.I. New York, Toronto and Saratoga Springs.

(3) Ontario Safety League Convention—Toronto.

(4) Meetings of Executive Committee Ontario Safety League, Toronto, Hamilton.

(5) Annual Congress National Safety Council—Milwaukee.

Workmen's Compensation Act.

An important amendment to the Workmen's Compensation Act was put into force July 1920, under which scale of compensation was increased from 55 p.c. to 66-2/3 p.c. of earnings with a corresponding increase in pension awards. Otherwise the Act remained the same as in 1919. The amendment referred to has added greatly to the cost of compensation.

Workmen's Compensation Board's Report 1919.

The Board's report for 1919 issued during 1920 shows a decrease in the total of compensatable accidents in all industries from 31,422 non-fatal and 194 deaths in 1918 to 27,788 non-fatal and 197 deaths in 1919, or a decrease of 8.38 p.c. in non-fatal accidents. During the same period the number of full time workers decreased from 330,310 in 1918 to 317,873 in 1919, a decrease of 3.76 p.c., so that the frequency of accidents during these two years, taking all industries together, shows a decrease even when allowance has been made for the decrease in full year workers during the same period.

Taking the Pulp and Paper Industry Only and Including Woods Operations.

The total number of compensatable accidents increased from 1461 non-fatal and 16 deaths in 1918 to 1563 non-fatal and 13 deaths in 1919, equal to an increase of 7 p.c. in non-fatal and a decrease of 18.7 p.c. in fatal accidents. During the same period the total number of full year workers increased only from 10,045 to 10,250 or 1.9 p.c. The total time lost decreased from 22,489 days in 1918 to 21,003 days in 1919, equal to 6.6 p.c. The above figures show that the frequency of accidents increased approximately 5 p.c. while the severity improved 6.6 p.c.

The total amount collected from class 2 was $252,747.36 from which was deducted a debit balance of $1,689.41 brought forward from 1918, leaving $251,057.95 available for 1919 liabilities. Of this amount $42,998.28 was paid out in compensation exclusive of pensions, $46,047.96 was taken as the capital value of pensions awarded, $4,039.68 was paid to Safety Association, $2,790.93 administration expenses, $1,635.00 for deferred compensation, $15,015.60 paid for medical aid, $1,455.07 for disaster reserve, $20,086.10 for continuing disability, $57,757.50 for oustanding accidents, $5,831.85 for estimated medical aid, making a grand total of $251,057.95 charged against the class including a provisional balance of $53,399.98 to be carried forward.

On the basis of the total amount charged against the class for 1918, every $100, contributed by the employers, would be divided as follows:—

	1919	1918	1917	1916
Compensation other than pensions	17.12	28.37	28.46	24.44
Deferred obligations	74.18	57.40	60.35	69.29
Paid to Safety Assoc.	1.61	2.81	3.84	3.85
Administration Expenses	1.11	1.21	.87	2.42
Medical Aid	5.98	10.11	6.48	*

* Incomplete year.

Accidents Reported During 1920 Exclusive of Woods Operations.

The total number of accidents exclusive of woods operations reported by the mills during the year 1920 was 1455 non-fatal and 17 fatal accidents, compared with 1032 non-fatal and 8 fatal accidents for the year 1919. This means an increase of 40.98 per cent in non-fatal and an increase of 112.5 per cent in fatal accidents. During the same period the total number of full year workers increased from 7159 to 7892, or an increase of 10.23 per cent.

The total time lost increased from 14,251 days in 1919 to 25,453 days in 1920, or in other words an increase of 78.6 per cent.

The figures are very disappointing, as even when allowance is made for the increase in full year workers of 10.23 per cent, both the frequency and severity of accidents shows a marked increase during the period under review. It is to be hoped that the competition now going on in the mills will result in a different and more satisfactory story being told next year.

COMPARISON TABLE 1917-1918-1919-1920.

(Woods Operations Not Included.)

	1917	1918	1919	1920
Accidents non-fatal	852	1124	1032	1455
Increase per cent	...	36.24	....	40.98
Decrease per cent	...	....	8.2	....
Accidents fatal	7	11	8	17
Increase per cent	...	37.14	....	112.5
Decrease per cent	...	....	27.27	....
Full year workers	6792	7064	7159	7892
Increase per cent	....	4	1.3	10.23
Time lost (in days)	14249	18650	14251	25453
Time lost per full year worker (in full	2.1	2.63	1.99	3.22

It is with great regret that I have to submit a report for 1920 which shows a large increase in accidents during that period both as regards frequency and severity. There is no cause that I know of that can be pointed to definitely as being responsible. True there has been unprecedented activity during the year

in new construction, and although purely construction accidents have been excluded from the statistics, still the usual environment of any plant while construction is going on is upset and the danger of accidents under general heads is greatly increased, but it is almost impossible to arrive at a reasonably accurate estimate of the increased hazard.

Thinking back over the period covered by this report and keeping in mind the conditions ruling, it seems to me very certain that progress can best be looked for during the current year by increasing the effort along educational lines. One step along this line has already been taken in the inauguration of an Accident Prevention Competition, full particulars of which have been sent to every mill. It is hoped that this competition will appeal to the sporting instincts of the individual, arouse a feeling of plant pride and a determination to secure a trophy. If the individual can be favorably impressed, and I think he can, then the individual acting collectively in each mill should make a wonderful record for 1921. The trophies will take the forms of shields of attractive designs mounted on wood secured from the ruins of the first mill operated in Ontario. The mounting of the shields in this way will add an historical value to the trophies. The mills are divided into two groups for the purpose of competition:

(1) Mills employing 200 people and up.

(2) All other mills.

By this method the disadvantages of the large mills competing with small mills will be avoided. Practically all the mills visited since the competition started (Jan. 1st 1921) have expressed interest and enthusiasm, and if they act as they indicated at safety committee meetings, then the competition should be keenly fought.

Some months ago your Engineer was appointed an honorary member of the American Pulp and Paper Mill Superintendents' Association and had the privilege of addressing the members at a meeting held at Niagara Falls early this year. A strong effort was made to enlist the active sympathies of the Superintendents, and judging from conversations with individuals after the meeting, the economic aspect of accident prevention as presented to the members has awakened a much warmer interest in our campaign. Attendance at future meetings should have the effect of increasing this feeling.

Note:—A chart classifying all accidents reported by the Pulp and Mills during the year 1917-18-19-20 accompanied Mr. Costigane's report.

FOREST PROTECTION PROPAGANDA BY FILMS.

About four hundred people, at Matane, P. Q., witnessed the reproducting on the screen of two films dealing with the forest. These films were exhibited by M. J. D. Brulé, of the Southern St. Lawrence Forest Protective Association, Ltd. They represented, one, the operations of Messrs. Price Bros. and Co., Ltd., in the Saguenay district, and the other, an educational film entitled "The Enemy of the Forest".

These films were shown in view of giving the public in general and the people of Matane, in particular, an idea of the importance of forest protection.

Price Bros. film was shown to demonstrate the turning into paper of hundreds of acres of virgin forest. This film has been described in the Pulp and Paper Magazine.

"The Enemy of the Forest".—This film was shown to demonstrate the difference there is between carefulness and negligence.

If on a pic-nic, put out your fire. If smoking in the bush, don't throw away burning cigarettes, lighted matches or cigar butts which might set fire.

Each Province has a system of forest protection that puts a ranger on the highest points of the forest and telephone to communicate with workers. Quebec is now working on this scheme, and in a few years we will have developed to a high degree of efficiency.

A GENEROUS EXAMPLE.

The Canadian Forestry Association has proved itself in the foremost rank, as an agency for impressing on the public the importance of Canada's forest resources and the absolute necessity of providing adequate protection. The association through its magazine, by lectures, the exhibition of moving pictures and by the use of demonstration cars, and through the medium of the public press as well as by direct appeal by bulletin to its members and by posters to campers and fishermen, has done the Canadian people a service which cannot be measured in dollars and cents. Such work however, cannot be done without financial support and this has come generously from many of those who appreciate the good work of the association. Among those enthusiastic supporters is Mr. F. J. D. Barnjum. Fortunately for the association, Mr. Barnjum is able to contribute generously as well as to devote a great deal of his time and ability to the conservation of Canada's forests. We reproduce Mr. Barnjum's letter to the secretary of the Association in the hope that his example may influence others to contribute in proportion to their means.

April 20th., 1921.

Mr. Robson Black, Secretary.
Canadian Forestry Association,
Ottawa, Ont.

Dear Mr. Black:—

I am duplicating my subscription of last year to the Canadian Forestry Association, and am enclosing my cheque herewith for $1,000.00, payable at par at any branch of the Royal Bank of Canada, to cover amount of same.

The small amount of snowfall of the past winter will probably mean low water and consequent dry conditions in the woods the coming spring and summer. This, with the enormous amount of dead dry trees which were killed by the spruce bud worm will increase the fire hazard to an extent greater than ever known in the history of timber lands in the Province of Quebec and New Brunswick, and I would urge upon all railroads, Forest Fire Protective Associations and the public in general for increased vigilance in the prevention and protection of our forests from destruction by fire. This is something that every man, woman and child in Canada has a personal interest in, as every mature forest tree that is killed means a matter of one hundred years to replace.

The Canadian Forestry Association is doing such good work that I feel it should have the hearty support of every citizen of Canada, and there never was a time in the history of Canada when the protection of our forests was of greater importance.

FRANK J. D. BARNJUM.

EXPORTS OF PAPER, WOOD PULP AND PULP WOOD

March 1920 and 1921; and twelve months ending March 1919, 1920 and 1921.

Paper		Month of March		Twelve months ended March		
Printing paper —		1920	1921	1919	1920	1921
Book paper	Cwt.	4,363	4,620	.....	47,573	65,194
	$	41,937	56,187	.....	436,330	779,763
Newsprint paper	Cwt.	1,426,149	1,515,468	.....	14,272,513	15,112,586
	$	6,186,305	9,162,330	.....	53,203,792	78,222,137
Printing paper	Cwt.	.....	.....	13,248,342	.....	.....
	$	.....	.....	40,718,021	.....	.....
Other paper	$	1,002,965	667,096	7,144,888	9,613,297	12,401,407
Total paper	$	7,231,207	9,885,613	47,862,209	63,253,419	92,103,307
Wood pulp —						
Sulphate (kraft)	Cwt.	258,020	139,175	.....	2,518,022	2,354,002
	$	920,420	596,756	.....	8,327,045	12,160,735
Sulphite, bleached	Cwt.	152,988	157,333	.....	1,220,764	1,941,922
	$	841,699	1,005,260	.....	6,291,452	15,195,065
Sulphite, unbleached	Cwt.	519,216	162,913	.....	4,863,156	4,785,040
	$	2,113,162	635,755	.....	18,381,566	27,704,419
Chemically prepared	Cwt.	.....	.....	8,332,930	.....	.....
	$	.....	.....	30,226,856	.....	.....
Mechanically prepared	Cwt.	289,092	139,868	3,508,726	6,787,640	5,282,042
	$	562,308	284,092	4,479,915	8,383,419	16,491,818
Total wood pulp	Cwt.	1,219,316	589,287	11,841,656	15,389,582	14,363,006
	$	4,437,589	2,321,863	34,706,771	41,383,482	71,552,037
Pulp wood	Cord	47,904	177,318	1,597,042	838,732	1,615,467
	$	497,984	2,342,495	15,366,600	8,454,803	21,513,594
Country of Destination.						
Paper and manufactures of —						
To United Kingdom	$	260,692	84,859	1,040,857	4,813,577	3,845,428
United States	$	5,899,762	7,571,169	38,621,265	50,367,339	72,170,129
Other Countries	$	1,070,752	2,229,585	8,200,787	8,072,503	16,087,750
Wood pulp —						
To United Kingdom	$	483,732	112,512	614,432	5,014,400	7,897,602
United States	$	3,214,373	1,901,991	30,674,820	31,316,753	57,966,545
Other Countries	$	739,484	507,360	3,417,519	5,052,329	5,687,890
Pulp wood —						
To United Kingdom	$	.....	.....	.....	.....	.....
United States	$	479,984	2,342,496	15,386,600	8,454,803	21,513,594
Other Countries	$	.....	.....	.....	.....	.....
Total paper, wood pulp and pulp wood —						
To United Kingdom	$	744,424	197,371	1,655,289	9,827,977	11,743,030
United States	$	9,612,120	11,815,655	84,682,685	90,138,895	151,650,268
Other Countries	$	1,810,236	2,736,945	11,618,306	13,124,832	21,775,640
Totals	$	12,166,780	14,749,971	97,956,280	113,091,704	185,168,938

The record of exports and the development in this particular business is an accomplishment for the Canadian Pulp and Paper Industry to be modestly proud of. (See editorial comment on page 470.)

CHANGES IN TECHNICAL SECTION MEMBERSHIP.

Mr. G. Meerbergen and Mr. T. F. McHenry, both of the Belgo Canadian Pulp and Paper Company, Ltd., are now **Full Members**. These gentlemen were formerly Associate members.

Mr. G. H. Lafontaine, of the Brompton Pulp & Paper Company, Ltd., is now a **Junior Member**. He was formerly a Student member.

New members were elected as follows:

A. J. Edward, International Paper Company, St. Maurice Lumber Company, Three Rivers, Que.

W. G. Mitchell, Canadian Export Paper Co., Sun Life Bldg., Montreal.

R. L. Weldon, Three Rivers Pulp & Paper Co., 511 St. Catherine St. W., Montreal.

John J. O'Sullivan, Three Rivers Pulp & Paper Co., Ltd., Drummond Building, Montreal.

Notes of the American Newspaper Publishers' Convention.

Publishers and editors from all parts of the country, numbering about 700, last week attended the thirty-fourth convention of the American Newspaper Publishers Association in the Waldorf-Astoria Hotel, New York City. Many of those present in the gatherings were present also at the annual meeting arranged by the Associated Press.

Opinions expressed by representative pulishers and others on general business and industrial conditions in the sections of the country under their direct observation indicated that the period of business depression has been passed. The general tone was optimistic—more so in the opinion of men from the West than from the East, and the latter were more sanguine than those from the South.

A warning against a possible future demoralization in the newsprint market was sounded by R. T. Williams, president of the publishers' association, in his address opening the convention. Mr. Williams said that newspaper rates should not be allowed to descend. He urged upon newspaper publishers the need of co-operating with government forces in restoring world peace and bringing business conditions back to normalcy, and especially in repealing unnecessary wartime legislation and obnoxious features of federal taxation laws. He held that these were largely responsible for the upsetting of sanely conducted business. Mr. Williams pointed out that newspapers must meet the problems in both materials and labor, since the average contract price of newsprint for the first six months of this year is higher than the average contract price for all last year, and labor is at the highest point known. He made the prediction that the newspaper of the future will be smaller, owing to this increased cost of production.

A resolution was adopted taking a strong stand in opposition to the concerted movement of union labor in the printing trades for a forty-four instead of a forty-eight hour week. In directing that the president of the association name a special committee to negotiate new arbitration contracts with the four international unions, the convention finally committed itself to the principle that every issue, without exception, upon which employers and employees were unable to agree should be determined by arbitration.

Figures showing the increase in wages that have taken place in the paper and pulp mills since 1914, were contained in a memorandum calling attention to the negotiations which have been carried between paper companies and their employees. A table prepared by the National Industrial Conference Board is cited in the memorandum. This gives the average weekly wages of male employees in thirty-two paper manufacturing establishments in the United States from the years 1911 to 1919 inclusive. These figures, all given for September, are as follows: 1914, $12.73; 1915, 12.75; 1916, $15.03; 1917, $19.03; 1918, $22.40; 1919, $22.40. In May, 1920, the papermakers received in these mills a 20 per cent increase in wages, which gave them an approximate wage of $26.88 last year. Figuring the wages of these workers for the entire year it is shown that they received an actual increase of 11 per cent. It is urged upon manufacturers that they would be justified in demanding that the workers agree to a wage reduction of from 15 to 20 per cent, inasmuch as living costs according to the National Industrial Board, 17.6 per cent lower than they were in July of last year. In commenting on this the association says: "No allowance is made in this estimate for the fact that wages, being the largest element in the cost of commodities, must come down before the cost of living can be cut—in other words, not follow, but lead, the reduced cost of living." Speaking of reductions made recently in mills manufacturing fine papers, the memorandum discloses the fact that working men have been willing to accept cuts in wages in order that conditions in that branch of the industry may be adjusted to the generally changed business conditions of the year. The decreases accepted average from 12 to 20 per cent.

Melville E. Stone, for many years secretary and manager of the Associated Press, relinquished his office to become "counsellor and secretary" of the associated newspapers. Frederick Roy Martin, who was appointed Assistant General Manager in 1912, was chosen to take Mr. Stone's place. Mr. Stone's resignation as active director, comes after twenty-eight years of such service with the organizatoin. He is now 73 years old and he has been in the newspaper and news gathering profession since 1864. Mr. Martin, the new general manager, is 50 years old. He was associate editor of the Providence Journal for many years before he went to join the Associated Press. Frank B. Noyes of the Washington Star was re-elected president.

The American Newspaper Publishers Association brought its meetings to a close after selecting its officers for the ensuing term and adopting a resolution expressing "confidence in the high patriotism" of President Warren G. Harding. In this the association "extends felicitations to a fellow publisher who has been called to high responsibilities in a time when great sanity and poise as well as undeviating patriotism are called for at the seat of national government."

R. T. Williams of the Pittsburg Press was re-elected president of the association. Howard Davies of the New York Tribune was elected treasurer. Mr. Davies succeeds George A. Clark of the New York World, Mr. Clark having resigned on account of pressure of business. All other officers of the association were re-elected.

DREW 35-TON LOAD OF LOGS.

Campbellton, N.B., May 1.—What is said to be the largest load of logs ever drawn by two horses was recently hauled by Fred and Harry, two Clydes, each weighing over 1,800 pounds, for the Shives Lumber Company of this town. Fred and Harry drew the load which weighs, as nearly as could be estimated, thirty-five tons, for a quarter of a mile on a logging road from Two Brooks Camp, on the Upsilquitch River, Restigouche County, to a landing on the river bank.

This is pretty good, but expressing the work done in terms of ton-miles it gives this team a score of 9, against 82 for the Abitibi team that hauled 33 tons 2½ miles. Next!

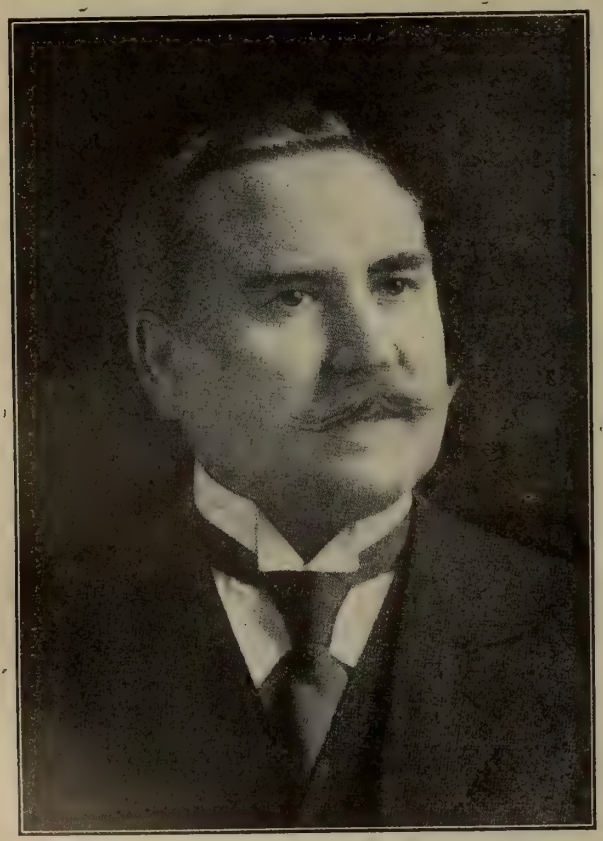
It's all right to put your best foot forward, but you won't get far if you don't follow up with the other one.

Canadian Export Paper Co's Huge Operations

By A. R. R. JONES.

A central sales organization handling the output of many of Canada's leading paper mills — that is the role filled by the Canadian Export Paper Company, Ltd., with its head office in the Sun Life Building, Montreal, and with agencies practically all over the civilized world. The Company is the export selling organization for the Laurentide Company, Ltd.; the Belgo-Canadian Pulp and Paper Company, Ltd.; the Brompton Pulp and Paper Company, Ltd.; the St. Maurice Paper Company, Ltd.; and Price Brothers and Company, Ltd. In addition, it acts as the exclusive export agents for the Howard Smith Paper Mills, Ltd.; the Provincial Paper Mills, Ltd.; and the Interlake Tissue Mills, Ltd.

Mr. Hubert Biermans, managing director of the Belgo-Canadian Pulp and Paper Company, Ltd., is president of the Company, and Mr. J. A. Bothwell, general manager of the Brompton Pulp and Paper Company,



MR. HUBERT BIERMANS,
President of the Canadian Export Paper Company, Ltd.

Ltd., is vice-president, while the other directors are Mr. George Chahoon, jr., president and general manager of the Laurentide Company, Ltd., and Sir William Price, president of Price Brothers and Company, Ltd.; Mr. G. F. Steele is the general manager.

The Canadian Export Paper Company, Ltd., is doing a much needed work in connection with the great paper industry of Canada. It is within the last six years or so that the pulp and paper industry has grown from one of comparatively modest and moderate dimensions to one of enormous magnitude. Thirty years ago, Canada's exports of pulp and paper products amounted to but $120 in value. Even ten years ago, they were only worth $10,000,000. Last year their value reached the stupendous total of $185,168,938. Thus the last few years have witnessed an unprecedented and unparalleled demand for the products of the industry. The bulk of Canada's pulp and paper exports goes to the United States. But much of them is also sent to Great Britain, Japan, China, Australia, New Zealand, South Africa, India, Burmah, Ceylon, Cuba, Mexico, Porto Rico, and South and Central America.

With an industry of such tremendous size, and in view of the strenuous conditions of the days in which we live, it was obvious that standardization and centralization had become fundamental necessities of manufacturing. It is to provide for buyers the equivalent in business of the advantages which a "unified command" offers in war—in other words, a central sales organization handling the output of many of Canada's leading paper mills — that the Canadian Export Paper Company was called into being. It is complete as to product, experienced as to requirements, and admirably equipped at all points for the task which it has in hand. For those who call upon its services it provides an organization ready with expert advice and assistance as regards the many problems — and not a few of these are of a somewhat complex kind — connected with paper and its uses, and ready, too, to deliver its product expeditiously and efficiently.

A word was said, just now, relative to the fact that in present-day conditions in the paper industry, standardization and specialization had become fundamental necessities of manufacturing. Not less fundamental, in connection with the marketing of newsprint, was the necessity of a combined selling association, to cover the export market. As the result of many years' experience, it had been proven that the marketing of newsprint was not on a sound basis. Nor could the field be adequately covered by a series of sales organizations. Moreover, there was, among those in Canada who could read aright the signs of the times, an apprehension, which, in the light of transpired events, has turned out to have been well founded, that the competition to be met with in the future would be very keen. Since the first of this year, the competition from Scandinavia and Germany — particularly, perhaps from the former, has been very keen indeed. It has amply demonstrated the wisdom of the policy of providing one efficient selling organization to compete with similar associations in the countries, just named. It was in 1917 that the Canadian Export Paper Company, Ltd., was organized to market the output of certain news mills. Today it is distributing a combined output of newsprint amounting approximately to twelve hundred tons a day.

This combined output is a huge one. It implies, moreover, the possession of large timber resources. For it must be borne in mind that, as it takes about 1½ cords of wood to make a ton of paper, an output of twelve hundred tons a day means the using up of wood at the rate of eighteen hundred cords a day. In their possession of timber resources, the companies which distribute their export products through the Canadian Export Paper Company, Ltd., are in a splendid position. For they control no less than 15,000 square miles of timber, with adjoining limits, comprising 30,000 square miles. Of this timber large bodies suitable for the manufacture of both mechanical pulp, or ground wood, and chemical

pulp, or sulphite, are contiguous to great water ways, and hence are easily and expeditiously driven.

Further, the companies distributing their export products through the Canadian Export Company are possessed of many other highly advantageous resources. Prominent among these are great water powers which guarantee a continuity of service at a reasonable rate, stable in flow, with large drainage areas, and with high heads capable of cheap development. Labor is abundant and satisfactory in quality. The tidewater locations are easy of access to the great markets of the world. The big consuming markets are accessible. And, finally, there is the supreme advantage of efficient and expert management.

Any survey of the Canadian Export Paper Company's sphere of operations must not omit mention of the fact that though, when it was organized in 1917, it was formed to take care of the marketing of the output of certain print mills, it now, in addition to the distribution of print, handles exclusively the output of certain mills making other qualities. Among these are the high-grade bonds and writings manufactured by the Howard Smith Paper Mills, Ltd., and the sulphite bonds manufactured at that concern's Crabtree division; the product of the Provincial Paper Mill Company, Ltd., so renowned for its excellence as a book papers; and the high-grade tissue and light weight wrapping, plain and crêpe toilet, etc., manufactured by the Interlake Tissue Mills, Ltd. The department dealing with the distribution of paper others than newsprint is in charge of Mr. Norman Wainwright.

Among its various departments, the Company operates a highly efficient and well equipped statistical department, of which Mr. A. E. Cadman is in charge. In this department the official trade returns of practically every country in the world are received and collated. Constant touch, by means of correspondence, is maintained with the government statistical offices of the various countries, and detailed information of the pulp and paper trade throughout the world,—and much of it of an invaluable kind—is thus obtained. The mode of operation followed in this department is for the records to be collected, converted into Canadian weights and currency, and issued, in the form of monthly, quarterly and annual reports, to the various departments concerned. In this manner close track is kept of the world's markets, sources of supply and trade possibilities. Graphic diagrams are employed where possible to render this information available at a glance. This department also receives the periodicals dealing with all branches of the paper and pulp trade, advertising and printing, in English, French, Norwegian, Swedish, and Spanish. From these periodicals are taken extracts dealing with the paper and pulp situation, prices in the various markets, trade opportunities and matters of interest generally. These reports are then sent out to the various departments of the Company.

A Paper Testing Department is maintained for the purpose of helping to maintain the standard of the products. This department is equipped with paper testers of various kinds, basis weight scales, etc. Of this department also Mr. A. E. Cadman is in charge. The different mills whose products are handled by the Company send in samples of their production each day, and these are tested for quality, appearance and character. Records are kept and sent out to the mills to enable them to compare their products with those of the other mills in the organization. In addition printed samples of newspapers are received daily, tested and checked for weight to ensure customers getting satisfactory service from the paper supplied by the Company. Tests and investigations are also held from time to time on such subjects as the "breaking weight," "percentage stretch" and "ink absorption" of the paper supplied by the Company.

The storage and packing facilities are of the best. As regards the former, all the mills in the organization are very completely equipped to store large stocks of raw material, in order that full production may be maintained in winter-time. In the matter of packing facilities, all the mills in the organization are equipped to pack in compressed, iron-bound bales or cases as required for the export market. Further, the strategic location of the mills in the organization on the main arteries of commerce in Eastern Canada and their proximity to the principal seaports of Eastern Canada and the United States, as well as their connection with the large trunk lines leading to all parts of the latter country, enable the Company to ensure speedy and satisfactory deliveries.



MR. J. A. BOTHWELL
Vice-President of the Canadian Export Paper Co., Ltd.

The general traffic manager is Mr. Guy Tombs, whose department looks after transportation matters for the mills in the organization, as well as the Company's own traffic business, and handles an average of 2,000,000 tons per year. Mr. W. G. Linehan, who is at present in South Africa, is in charge of the overseas department, and Mr. H. W. Cressy is in charge of the order department which distributes orders and controls the tonnage distribution. Mr. N. P. Dalziel is comptroller of the accounting department. The secretary-treasurer of the Company is Mr. E. S. Gallop, and Mr. A. M. Gammell is assistant secretary-treasurer.

The Dominion Envelope and Cartons Ltd. report a record year for 1920 with total shipments of over $1,250,000. They have installed in their new plant in Toronto complete machinery for manufacturing a complete line of confectionery bags which represents probably the most up-to-date equipment for the economical manufacturer of this class of goods.

Parchment and Imitation Parchment.

By Dr. G. SCHUMANN.

(Translated by Dr. Paul Bartholow for Pulp and Paper Magazine.)

The papers usually associated with the name "parchment," possess certain qualities which bear a resemblance more or less close to animal parchment or vellum. One of these, pergamyn, constitutes a grade which may be called a substitute of substitutes, for it differs from imitation parchment in furnish and manufacture, and from vellum in material. However it exceeds both of the finer grades in respect of production and is found today in large quantities on the German market.

In view of the commercial importance of these imitation parchments, it may not be uninteresting here to describe the process of manufacture, so far as it relates to the production of these qualities which distinguish the true parchment. In the preparation of animal parchment the material is the integument, usually of kids or lambs cleaned with lime and stretched smoothly; thinning substances are not used, but the skin is dried and loaded with a slight proportion of white lead coloring matter. It will be seen that we are dealing here with a gelatinous tissue, which is translucent, and which through boiling, is converted into gelatine, or, in a word, completely gelatinized. This gelatinization is the characteristic of parchment paper, and since it can be produced with vegetable fibers, the modern paper, composed of plant tissues, is likewise capable of being gelatinized. The process consists of three operations:

1. Treatment with sulphuric acid, forming the so-called **genuine** parchment paper, or substitute for vellum;

2. Crushing or squeezing of plant tissues forming the substitute for imitation parchment, or pergamyn;

3. Treatment of the moist paper pulp under pressure and calendering on heated rolls, forming the imitation parchment.

1. In this process unsized paper, free from loading, is employed, the so-called raw material for parchment, which is preferably composed of fibers cut sharply, the "pink" pulp from the beaters, bleached cotton fibers or bleached sulphite cellulose, or a mixture of both. The paper in rolls goes to the parchment machine after being drawn through a trough filled with sulphuric acid of 60 Be, and not below 10°. The glass rolls are immersed to such a depth that the surface of each paper roll is wetted 3-12 seconds in the sulphuric acid. The sulphuric acid converts the surface of the fibers into amyloid, a glassy gelatinous mass, like parchment. The interstices are filled, resulting in a thick paste, so that by means of this property two sheets of paper can be run through each pair of calender rolls at the same time. The paper sheet is then run into chests through which a current of fresh water flows, and at the end of the process, the last traces of acid are neutralized in an alkaline bath. The sheet is dried and rewound.

In its characteristic properties the product bears a very close resemblance to animal parchment; it is durable, does not rot, and being unaltered by hot water cannot be repulped or reduced to its original fibrous state by the edgerunner or digester. The simplest test of its quality is to rub the wet paper sheet between the fingers; if it softens and breaks up it is not vellum, nor even sulphuric acid parchment, but substitute pergamyn, produced from paper pulp after beating, as in the following process.

2. This consists in crushing between stones, or in the hollander with the roll considerably above the bedplate, by which means the plant tissues are converted superficially into amyloid. The sheet is gelatinized, closing the pores and giving the character of parchment. In the hollander the pulp swells, becomes very viscous, with a feel like paste, and yields upon the paper machine the so-called imitation parchment or pergamyn. The difference between the two is in the nature of the pulp, although in the case of parchment substitutes the beating of the pulp is carried further, so as to give the appearance of machine-glazed paper and for the most part of whitish color, like the acid parchment. On the other hand pergamyn which is calendered in the wet state, usually under low pressure, easily attains the translucent character of parchment and consequently does not require so long a beating.

3. The calendering described under 2 is adapted in itself to produce a paper sheet like parchment. Writing and printings, through wet calendering, take on a dull green color, since the finest fibers are compressed one upon another by the high pressure, becoming squeezed out and in a certain measure viscous and gelatinized. The interstices are filled by the pressure, whereby a homogeneous, translucent sheet, like parchment, is produced. It is because the foaming water becomes clear again on standing, and the crystalline gelatine becomes translucent through heat, that is, through the closing of small pores.

Imitation parchment may be disintegrated again into its fibrous portions, like pergamyn, and consequently can be manufactured into paper again, and gelatinized.

A property much desired in modern parchment papers is the greaseproof quality. This is not to be attained by process 3, but by 1 and 2. The simplest method of testing is to hold a burning match at some distance under the paper; this causes bubbles which, according to their extent, permit of a judgment as to the degree of the greaseproof quality. Since parchment is disintegrated in water in processes 1 and 2, and is converted in raw stuff processes 1 and 2, it is sensitive to water, and consequently can only be used in certain circumstances as a substitute for acid parchment.—Papier-Markt, March 19, 1921.

The Canada Paper Company lost their case with regard to the use of sulphate of soda in their soda pulp mill. This injunction, against the use of materials which produce an unpleasant smell was granted in the Superior Court and the judgment confirmed in the Court of Appeals.

The Broke Hustler repeats: "Dead men tell no tales." Sure enough; also — they bring home no pay envelope.

British Trade News

(From OUR LONDON CORRESPONDENT.)

London, 15th April, 1912.

The strike of coal miners in the United Kingdom still continues. Fortunately for trade and industry the railroad and transport workers have not yet come out, as they threatened to do out of sympathy with the miners, but their threats are still overhanging mills and the Imperial Government is ready for any emergency. Coal is now rationed and paper mills are running short of supplies, thus causing many to close down.

The Newsprint Agitation.

Mr. Stanley Cousins' recent appeal to the Government to include paper in the Order for the Protection of Industries against dumping, and which was opposed by Lord Beaverbrook and Sir Edward Hulton, is still causing some excitement amongst the "Free Traders" and the "Protectionists". Both sides have freely expressed opinions and the newsprint consumers say they must have paper from Finland and Germany to keep the prices down. Mr. H. Reeve Angel, whose firm are the sole agents in the United Kingdom for the Finnish Papermill Association writes: ". . . We would like to make Finland's position clear in relation to Mr. Stanley Cousins' assertion (alleging dumping and depreciated currencies as the cause of the depression and unemployment that have afflicted the British paper trade). Grouping all newsprint contracts made by Finland with British and Irish publishers for delivery over 1921, the average price represents £37 6s. 8d. (8 cents per lb) per ton net. delivered. The highest price of my contract (with one minor exception—to the extent of less than 200 tons) is 4½d. (9 cents) per lb., net delivered. Sir Edward Hulton has stated that the British mills price today for newsprint is 4d. (8 cents) per lb. also that a similar grade of paper is to be had in New York at 4 cents per lb. Many of the paper mills in this country have made bad pulp contracts, due to the unprecedented demand for both chemical and wood pulp in the United States in the early part of last year, and it resolves itself into a question whether the losers are to be the paper mills or the consumers of paper, among which, of course, are the major number of the newspapers of this country."

Americans and Canadians can realize the amount of business done in the early part of 1920 in pulp. It certainly was not alarming. But it is true that big prices had to be paid for pulps and paper mills were buying from hand to mouth. However, it is now stated on authority that newsprint made in Finland can be shipped here and sold at 8 cents, while the domestic producer is selling under cost price at the same figure. Everything is in Finland's favor from raw materials to labor and it is Mr. Stanley Cousins' contention that the depreciated Finnish currencies enables mills in that country to quote prices delivered in England which are far below those of British mills. That is the crux of the whole question and it is against this unfair trading British millowners—at least the majority, as a great many are "Free Traders"—are seeking a temporary protection. Germany, for instance, some time ago could buy pulp in Finland at 150 Marks to the £1 and sell it in England at 235 Marks to the £1. Before the war the British £1 was equal to 20 Marks. British papermakers have to face hard facts; they cannot undersell the foreign imports without losing and their only remedy is some form of protection to save the mills and keep down the growing unemployment.

Pulp Imports.

During January to March last the total imports of all kinds of pulps reached 105,668 tons, as against 207,415 tons for the corresponding months in 1920. The imports for March alone reached 25,994 tons compared with 64,798 tons in March 1920. Canadians will see from these figures that "all is not well" in the United Kingdom. The following were the countries of supply in March:—

Bleached chemical—Finland, 0, (Jany-March 1 ton); Sweden, 0, (99 tons); Norway, 523 tons, (3,407 tons); Germany 0, (140 tons); Canada and other countries, 114 tons, (379 tons).

Unbleached Chemical—Finland, 582 tons, (Jany-March 1,610 tons); Sweden, 1,520 tons, (15,606 tons); Norway, 2,681 tons (9,122 tons); Germany, 0, (990 tons); Canada and other countries, 0, (732 tons).

Groundwood—Sweden, 50 tons (Jany-March 435 tons); Norway, 15,733 tons (63,670 tons); Canada, 4,500 tons, (7,520); other countries 0.

The customs value on Norway's shipment of 15,733 tons of groundwood is £159,282, while that of Canada's 4,500 tons is £54,000. This works out on the declared value at £12 a ton for Canada and £10 12s. 5d. for Norway. Groundwood today is £8 10s. a ton in London (c.i.f) f.o.b.

Imports and Exports of Paper.

The imports of papers from all sources in March were 470,118 cwts. as against 873,290 cwts in March 1920. For the first 3 months of 1921 they were 1,344,963 cwts. and for 1920, 2,735,222—a reduction of 50.8 per cent. The falling off was shown in packing and wrapping paper, printing and writing papers, mill, leather and cardboard. The supplying countries in March were:

Newsprint—Sweden, 58,676 cwts. 135,234 received between Jany and March); Norway, 23,517 cwts. (55,709 cwts.); Germany, 6,727 cwts. (25,203 cwts); Belgium, 10,004 cwts. (17,968 cwts); U.S.A. 552 cwts. (3,190 cwts.); Canada, 0, (4,920 cwts.); Newfoundland 0; other countries (including Finland) 94,250 cwts. (199,610 cwts.).

Packing and Wrapping Paper—Finland, 20,841 cwts. (37,954 cwts.); Sweden, 22,974 cwts. (77,332 cwts); Norway, 12,210 cwts. (43,751 cwts.); Germany, 14,199 cwts. (58,021 cwts.); Belgium, 6,882 cwts.; Canada, 67 cwts. (7,359 cwts); other countries, 44,179 cwts (34,025 cwts.).

Coated Papers—Germany 2,300 cwts. (Jany-March, 5,226 cwts.); Belgium, 1530 cwts. (4,024 cwts.); France, 164 cwts. (1,233 cwts); U.S.A., 851 cwts. (2,875 cwts.); other countries 638 cwts. (1,558 cwts.).

Turning to the exports of the British mills, the figures for all kinds of paper, cardboard, and bags, reached 109,551 cwts. for March last, compared with 163,773 cwts. in March 1920. The total for the 3 months of 1921 is 461,888 cwts., as against 437,453 cwts for the corresponding month in 1920. These figures for the three months of the year are not startling, but they show that the export trade is receiving considerable attention, though there was a decline in the March shipments. The countries to which paper was sent in March are as follows:—

Printing (mostly of a fine quality)—France, 290 cwts. (4,309 cwts during Jany to March); U.S.A., 584 cwts. (1,918 cwts.); other Foreign countries, 2,258 cwts. (43,488 cwts.); British South Africa 5,033 cwts. (31,-145 cwts.); British India 6,773 cwts. (34,716 cwts.); Straits Settlements, 1,565 cwts. (4,734 cwts.); Ceylon, 2,496 cwts.)4,776 cwts); Australia 20,815 cwts.); New

Zealand 2,205 cwts. (19,441 cwts.); Canada, 419 cwts. (1,294 cwts.); other British possessions, 2,482 cwts. (12,926 cwts.). A total of 50,920 cwts in March valued at £220,770 and for the 3 months of 1921, 248,064 cwts. valued at £1,133,885 (as against 163,536 cwts. valued at £600,834 in 1920.)

Writing Paper—France, 12 cwts. (567 cwts. Jany-March); U.S.A., 88 cwts. (113 cwts.); other Foreign countries, 1,862 cwts. (8,980 cwts.); British South Africa 478 cwts. 3,370 cwts.); British India, 2,755 cwts. (8,190 cwts.); Straits Settlements, 199 cwts. (1,226 cwts); Ceylon, 223 cwts. (990 cwts.); Australia 2,226 cwts. (12,485 cwts.); New Zealand, 1078 cwts. (5,829 cwts.); Canada, 102 cwts. (10 cwts.); other British Possessions, 745 cwts. (3,102 cwts.). A total of 9,768 cwts. valued at £69,845 in March and for the 3 months in 1921, 45,036 cwts. valued at £313,676 (as against 43,851 cwts at £226,405 for the same period in 1920).

Paper Makers' Association.

Owing to the strike, and threats of strikes, the Members of the Paper Makers' Association decided at the eleventh hour to put their annual dinner off until more congenial times.

This week, however, has been a busy one with conferences and meetings—some private and some open. Owing to the space at present at my disposal I will only deal with the Technical side of the Association. At the annual meeting of the Technical Section a report was read by Mr. A. W. Foster, B.A., (the Secretary) from the chairman, Mr. A. Baker, who has left nothing undone to arouse interest and develop the usefulness of the Section. The report stated that all the initial difficulties in establishing the Section had been overcome successfully and the constitution had been carefully drawn which would enable them to lay the foundation for the future upon a very broad base. "The membership," went on to report, **inter alia**, "includes 1 honorary member, 158 members, 41 associate members, 20 juniors, total 220. Three general conferences have been held—two in Manchester and one in London—and regular meetings of less formal nature in the Aberdeen, Manchester, and London areas. The subjects brought before the Section have been matters of live interest and the meetings have undoubtedly stimulated thought and inquiry in directions which cannot fail to react in a beneficial manner on the industry. As the President of the Association realized at our first meeting in Manchester we have tapped a new source, mainly of younger men, who will take a keen interest in the work connected with the trade. . . ."

Mr. A. W. Foster had also a reference to the Technical Section in his own report and he regretted that only 26 firms had become members of the Section. He appealed for assistance in a practical manner.

In the election of officers that followed, Mr. Baker was re-elected to the Chairmanship of the Section and Major J. Edington Aitken, whose paper was read with so much interest sometime ago in the "Pulp and Paper Magazine," was re-elected to the vice-chair.

It was agreed that there would be two general conferences of the whole section in the year, apart from small local meetings. Some of the important papers will be published. The next conference will be in Scotland about September probably.

Mr. T. D. Nuttall followed with a paper on "Recent Development in Papermaking" covering the changes of the past decade, and "Electricity in the Paper Mill on Heat Economy Lines" was the title of a paper submitted by Mr. A. B. Mallinson.

Reciprocity Advocated.

It is contended now that Scandinavian pulp mills should help the British papermakers out of a difficulty. The latter have 9 months pulp stock with little or no prospect of appreciably reducing it to make room for further commitments. Mills which committed themselves faced with the unhappy prospect of finding room for an increased supply of expensive stock when the demand for paper is even below normal.

NIPIGON FIBRE AND PAPER MILLS, LTD.

This illustration is a picture of the mill of the Nipigon Fibre and Paper Mills, Ltd. as it looked in January 1921.

We are now operating eight three-pocket grinders and expect to have twelve in operation by the end of Summer. The mill is operated throughout by electricity.

The grinders are operated in tandems of two by one thousand (1000) horse power motors for each set, giving plenty of power and steady running. All machinery throughout the mill is operated by individual direct connected motors.



General View of the Nipigon Fibre and Paper Co., Ltd.

The company controls over 1,500,000 acres of land, conceded to contain the finest growth of spruce in the Province of Ontario.

The plant is situated at Nipigon, Ont., on both the Canadian National Railway and the Canadian Pacific Railway, with siding into the mill yard.

The plant is situated on the famous Nipigon River, noted for the fine specimens of brook trout caught in its waters; some of the wonderful fish caught there last year weighed over seven pounds.

The company can load ocean going steamers right from the mill site, at its wharf on Lake Superior.

The officers of the Company are—James A. Little, President; M. D. McAlpin, Vice-President; Jacob Seibert, Secretary and Treasurer.

A VALUABLE BIBLIOGRAPHY.

From the library and the laboratory of A. D. Little, Inc. has come much information of interest and value to the paper industry. The latest contribution is a volume of 170 pages giving a bibliography of paper making materials which is reprinted from the Paper Trade Journal. This gives not only the names of books on pulp and paper manufacture but gives a bibliography of magazine articles on the subject of the various fibres that are employed by the industry. We find references as recent as November 1920.

Arthur D. Little, Inc. generously offer to send a copy to anyone connected with the industry who will address them at Cambridge, Mass.

NEWSPRINT PRODUCTION LESS, STOCKS LARGER.

The Federal Trade Commission reports that:

The average production of total newsprint and standard news based upon the total combined production for the years 1918, 1919 and 1920, amounted to 121,959 tons of total newsprint and 109,782 tons of standard news, for a period corresponding to March. The actual production for March 1921 amounted to 107,532 tons of total newsprint and 98,190 tons of standard news, which for total newsprint was 12 per cent below the average for the three-year period and for standard news 11 per cent below the average.

The production of newsprint for March, 1921, compared with March, 1920, shows a decrease, amounting to 16 per cent for total newsprint and about 18 per cent for standard news. The production for March, 1921, compared with March, 1919, shows a decrease of 6 per cent for total newsprint and a decrease of 6 per cent for standard news. The increase of production for March, 1921, over March, 1918, amounted to 2 per cent for total newsprint and 3 per cent for standard news. Mill stocks of both total newsprint and standard news increased during March, 1921.

Imports and Exports.

The imports and exports of printing paper not dutiable (practically all newsprint) and of woodpulp for the month of February, 1921, compared with the month of February, 1920, were as follows:

	Feb. 1921 Net tons	Feb. 1920 Net tons
Imports of Newsprint (total)	58,893	52,126
From Canada	48,894	50,581
From Germany	5,642	....
From Sweden	694	1,545
From Finland	417	....
From Norway	2,858	....
From other countries	388	....
Exports of Newsprint (total)	2,533	2,764
To Argentina	730	779
To Cuba	949	247
To Uruguay	320	67
To other countries	534	1,671
Imports of Ground Wood Pulp (total)	3,275	11,973
" Chemical " "	15,547	46,848
Unbleached Sulphite	6,620	28,904
Bleached Sulphite	3,140	3,969
Unbleached Sulphate	5,787	13,400
Bleached Sulphate	....	575
Exports of Domestic Wood Pulp	2,714	3,585

The imports of ground wood pulp for February, 1921, were 8,698 tons less than for February, 1920. The exports of domestic wood pulp were 871 tons less than for February, 1920.

Stocks of rolls in the hands of jobbers at the end of March were 419 tons less than the stocks in the hands of the same jobbers at the beginning of the month. Stocks of sheets were 815 tons less at the end of March than at the beginning of the month. The net decrease in the total stocks of newsprint in the hands of jobbers at the end of March amounted to 1,234 tons.

Commitments to sell roll news were 6,017 tons greater than commitments to buy. Commitments to sell sheet news were 739 tons less than commitments to buy. Total commitments to sell both rolls and sheets were 5,278 tons greater than commitments to buy.

Publishers' stocks increased 5,216 tons during the month. The average daily tonnage used during March was 141 tons more than the average used in February.

Publishers' stocks and transit tonnage on March 31st represented slightly more than 49 days' supply at the existing rate of consumption.

Eighty-four publishing concerns held about 85 per cent of the tonnage on hand at the end of the month.

The domestic consumption of standard news, by metropolitan dailies using between one-half and three-fourths of a million tons annually, for March, 1921, when compared with March, 1920, shows that the consumption for the month of March, 1921, increased about 4 per cent over March, 1920, and increased slightly less than 15 per cent for March, 1921, over March, 1919.

Average Prices Paid by Publishers.

The weighted average price of contract deliveries from domestic mills to publishers during March, 1921, f.o.b. mill in carload lots for standard news in rolls was $5.862 per 100 lbs. This weighted average is based upon March deliveries of about 45,000 tons on contracts involving a total tonnage of approximately 680,000 tons of undelivered paper manufactured in the United States.

The weighted average contract prices based on deliveries from Canadian mills of about 26,000 tons of standard roll news in carload lots, f.o.b. mill in March, 1921, was $6.48 per 100 pounds. This weighted average is based upon the March deliveries on contracts involving about 355,000 tons of undelivered Canadian paper.

The weighted average market price for March of standard roll news in carload lots f.o.b. mill based upon domestic purchases totalling about 2,600 tons was $5.623 per 100 pounds.

HOW PAPER BOXES ARE MADE.

The use of paper boxes of various kinds is an important factor in the progress of merchandising during the last score of years. During this period of growth, improvements and developments have come from local experimentation and until lately there has been little opportunity for cooperation among those making and using this useful article. There has lately come to the editor's desk, a little book 225 pages with 100 illustrations by Robert F. Salade, explaining how paper boxes are made. This is a very practical and instructive book which can be understood by the beginner and tells how to manufacture all kinds of paper boxes and includes special chapters on the printing department and the embossing, labelling, etc., which contribute so much to the effectiveness of paper boxes. We did not think there were so many kinds of boxes and cartons until we looked over the table of contents, nor did we realize the many operations nor the clever machinery by which these are now carried out with the minimum of labor as well as the minimum of waste. The book is published by the Shear's Publishing Company, at Lafayette, Ind.: This company also publishes a journal of information for the Paper Box Trade entitled "The Shears."

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. The proximate analysis of hardwoods; studies on Oak (QUERCUS AGRIFOLIA.) W. H. DORE, Univ. of California Agric. Expt. Station. J. Ind. & Eng. Chem., **12,** 984-7, (Oct. 1920). Methods previously used for the analysis of coniferous woods were investigated as to their applicability to hard-woods. Oak wood, as a typical hardwood, was analyzed by suitable modifications of these methods. The material used was the wood of coast live oak (**Quercus Agrifolia**) in the form of fine saw dust. The purification treatment employed for the tissue of coniferous woods (successive extns. with benzene and alc.) was supplemented with digestion in cold water and cold 5% NaOH soln. These treatments remove all adventitious substances, but do not injure either the lignin or the cellulose. Lignin was detd. by the gaseous HCl method recently proposed by Konig and Becker. The modified procedure conforms to the requirements of a satisfactory analytical scheme in that it accts. for all the material of the wood, yields the max. amts. of the main constituents free from impurities or degradation products, avoids overlapping of constituents, and overlooks no constituent of importance. The compn. of oak wood as found by these methods is as follows (the figures are in every case avs. of 2 or more detns.):

Constituent.	Air-dry basis %	Oven-dry basis %
Loss on drying	4.20	....
Benzene extract	0.50	0.52
Alcohol extract	4.33	4.52
Soluble in cold water	3.66	3.82
Soluble in Cold 5% NaOH soln.	18.71	19.53
Cellulose	45.48	47.47
Lignin	20.25	21.14
Pentosans not otherwise accounted for	1.89	1.97
Mannan((residual)	Nil	Nil
Galactan (residual)	1.49	1.56
Total	100.51	100.53

The av. values for constituents of the purified tissue, and also the yield of purified tissue were:

Cellulose	45.85%
Lignin	20.25
Pentosans not otherwise accounted for	1.89
Galactan (residual)	1.49
Total	69.11
Residue after extraction (purified tissue)	68.60

Alkaline digestion is necessary for the best results with oak wood, and presumably with the hardwoods generally, in the prepn. of the purified tissue for cellulose and lignin detns. The coniferous woods should be prepd. without, and the hardwoods with, alkaline digestion.—A.P.-C.

A-3. Papyrus as a source of paper pulp. RAYMOND FOURNIER. Papier, **23,** 178-80, (Aug. 1920); 197-200, (Sept. 1920). A botanical, microscopic, and microchem. description of papyrus, together with a description of the method of prepg. papyrus pulp and of the microscopic characteristics of this pulp. Its many advantages over esparto as a source of paper pulp are described.—A.P.-C.

A-12. The jelly strength of gelatins and glues. S. E. SHEPPARD, S. S. SWEET, and J. W. SCOTT, Jr., Research Lab., Eastman Kodak Co., Rochester, N.Y. J. Ind. & Eng. Chem., **12,** 1007-11, (Oct. 1920). A torsion dynamometer is described for detg. the jelly strength of gelatins and glues under pure shear of molded cylindrical test pieces. Both the "breaking load" and the % twist at break are detd.; the product of breaking load x twist, divided by the cross section of the test piece, is taken as the jelly strength. No simple relation holds between the concn. of gelatin and the jelly strength; furthermore, the curves relating these values for diff. com. gelatins do not belong to a common family, and frequently cut each other. Hence, jelly-strength values detd. for a single arbitrary concn. give a very arbitrary comparison of the jelly strengths. There appears, consequently, to be no definite relation between the jelly strength, at a given concn., and the glue-joint or tensile strength of a dry glue joint.—A.P.-C.

A-14. Notes on the testing of filter paper. J. RIGAUD-MONIN, French School of Papermaking, Grenoble, France. Papeterie, **42,** 818-21, (Sept. 25, 1920). A brief mathematical discussion of the Herzberg tester for filter paper, showing that the test may be carried out at a temp. t° other than that prescribed by Herzberg (20°C). The results may then be calculated to a basis of 20°C by multiplying by the factor V_t/V_{20}, where V_t = coeff. of viscosity of water at t°, and V_{20} = coeff. of viscosity of water at 20°. R.-M. suggests applying this test to blotting papers also.—A.P.-C.

B-4. Treatment of wood to obtain glucose. Br. patent No. 43,212—1919, L. TERRISSE and M. LEVY, Geneva, July 21, 1920. Chem. Met. Eng., **23,** 797, (Oct. 20, 1920). One part of wood is first dried, treated with 1 to 2 parts of 35% HCl, and supersaturated with gaseous HCl until the acid concn. reaches 41%, the temp. being maintained between 0° and 25°C. It is then allowed to digest at a slightly higher temp., and finally the surplus acid is removed and the glucose purified by washing and filtration.—A. P.-C.

D-4. Wood grinder. Fr. Patent No. 506,065, VICTOR ANTOINE, Belgium, May 21, 1920. Papier **23,** 203-5, (Sept. 1920); Papeterie, **42,** 833-4, (Sept. 25, 1920). The grinder consists essentially of a saw-blade spirally wound around a drum which is given both rotary motion and a slight axial oscillatory motion.—A. P.-C.

L-7. Machine for the preparation of narrow strips of paper pulp for the manufacture of paper thread. Fr. patent No. 505,685, TURK GESELLSCHAFT m.b.H., Germany. Papeterie, **42,** 834-7, (Sept. 25, 1920).—A. P.-C.

E-2; K-10. Sizing Paper with Waste Sulphite Liquor. Ger. patent No. 307,087, Feldmuehle Papier and Zellstoffwerks A.-G., Berlin, Nov. 30, 1917. **J. Soc. Chem. Ind.,** xxxix, 15A (Jan. 15, 1920). Fibrous materials or finished products prepared from them are treated with solutions of the organic matter (lignin) from sulphite waste liquors rendered precipitable by treatment with

alkalis, and the size is precipitated on the fiber by the addition of acids or suitable salts. The lignin size may be used in conjunction with other known paper-sizing agents. By heating with alkalis the sulphonic group is completely eliminated from ligninsulphonic acid and a dark brown alkaline solution of lignic acid is obtained, which gives a voluminous precipitate with acids or salts. About 10 to 20 per cent of NaOH, calculated on the dry substance of the sulphite waste liquor, is required. Alternatively, the alkaline liquor may be neutralized with acid, precipitated by alum or kieserite, and used for sizing in the proportion of 2 percent. —A. P.-C.

E-5. Controlling the cooking operation in the sulfite process. J. G. VARLOT, Papier, **23,** 169-73, (Aug. 1920); 193-7, (Sept. 1920). A discussion of the various factors which must be taken into consideration in the prepn. of cooking liquor and in the cooking operation (by the indirect method, together with a description of the methods used for analyzing the cooking liquor and the liquor at various stages in the cooking.—A.P.-C.

G-11. The Denoël pulp thickener: comparison with the Kenicott water purifier. JOS. DENOEL, Engineer of the Papeteries de Ruysscher, Lembrecq-lez-Hal, Belgium. Papeterie, **42,** 770-4, (Sept. 10, 1920). The main diff. between the 2 consists in that the summit angle of the inner cone is much greater in the Denoël app. than in the Kenicott app. This results in a very complete sepn. of the solids (up to 97.5%) merely by sedimentation in the former; while in the latter recourse must be had to a fiber filter to eliminate the solids which were not sepd. by settling. The influence of the summit angle of the inner cone, and of the direction of motion of the water during the purification are discussed at some length. (See also Theory and Practice of the Recovery of Papermaking Materials in the Waste Water of Papermills. Pulp & Paper, **18,** 729, K-2, July 8, 1920).A. P.-C.

K-3. Waterproofing paper. Br. patent No. 143,235, L. HEILBRONNER, Stuttgart, July 21, 1920. Chem. Met. Eng., **23,** 751, (Oct. 13, 1920). Paper is waterproofed and rendered impervious to air so that it may be used as a substitute for rubber or leather for making diaphragms for gas meters and gas lighters, or for the manuf. or purses, etc., by impregnation with a warm soln. of animal and vegetable glutinous substances, followed, after drying, by rubbing in fat, whale oil, etc. Long-fibered paper, such as japan paper, is preferably employed. A suitable impregnating soln. consists of gelatin 2 parts, agar-agar 1 part, $K_2Cr_2O_7$ 0.5 part, $CaCl_2$ or glycerine 3 parts, and $(NH_4)_2CO_3$ for reducing inflammability 3 parts, all dissolved in 100 parts of water. Gelatine alone may be used when brittleness is not objectionable, and the after treatment with fat or oil is necessary only when the material in use is alternately wetted and dried.—A. P.-C.

K-6. Obtaining paper pulp by retting. J. MICOL de PORTEMONT. Papier, **23,** 200-1, (Sept. 1920). P. suggests that paper pulp be prepd. from straws or grasses by means of the Rossi flax-retting process. It would be longer than the present chem. methods of treatment, but the simplicity and cheapness of the retting process would far more than counterbalance this slight disadvantage.—A.P.-C.

K-6. Process and Apparatus for Treating Paper Pulp. U. S. patent No. 1,322,489, G. C. HOWARD, Tacoma, Wash., U.S.A., Nov. 18, 1919. **J. Soc. Chem. Ind.,** xxxix, 15A (Jan. 15, 1920). A diluted mixture of pulp and water is caused to impinge upon the lower part of one side of a pair of rapidly rotating rolls disposed within a vat of semi-circular cross-section whereby the pulp is drawn between the rolls and a homogeneous mixture is discharged at the opposite side of the vat.—A. P.-C.

K-7. Apparatus for Making Paper. U. S. patent No. 1,318,900, J. T. MURPHY and E. J. RANEY, assignors to J. L. CAREY, Chicago, Ill., Oct. 14, 1919. **J. Soc. Chem. Ind.,** xxxix, 14A (Jan. 15, 1920). Two beating engines are provided at different levels, the lower one being operated intermittently and the higher one continuously. A stuff chest having a capacity greater than that of the intermittent beater is situated at the intermediate level, and means are provided for conveying stock from the intermittent beater to the stuff-chest and thence to the continuous beater.—A. P.-C.

K-10. Sizing paper with Montan wax. Ger patent No. (A) 305,678 (B) 310,076, P. KLEMM, Cautzach, Jan. 12 and May 8, 1917. **J. Soc. Chem. Ind.,** xxxix, 15A (Jan. 15, 1920). (A) A stable emulsion of montan wax, suitable for sizing paper, is obtained by heating it with a small quantity of resin soap or naphtanic acid soap in alkaline solution. (B) Liquid resin (**Tallol**) obtained from soda waste liquor (See **J. Soc. Chem. Ind.,** xxxv, 1163, 1916) is saponified and used as the emulsifying agent, somewhat less than 25 per cent of the quantity of montan wax being required.—A. P.-C.

K-10. Manufacture of Hard-sized paper.—Ger. patent No. 313,142, O. RUFF, Breslau, April 25, 1918. **J. Soc. Chem. Ind.,** xxxix, 15A (Jan. 15, 1920). Paper precipitated with the addition of vegetable mucilages or with substances capable of yielding mucilages, or paper made from pulp which has previously been treated with acids or acid salts (see **J. Soc. Chem. Ind.,** xxxviii, 284A, 625A, 896A, 1919; Ger. patent No. 309,-999, 311,772, and 312,179) is subjected to a heating treatment. Example: From 10 to 30 per cent of powdered peat calculated on the dry substance is added to the pulp in the hollander, and after the paper has been made it is heated at 120° Cent. for about two hours.—A. P.-C.

K-10. Sizing, Waterproofing, etc., of Paper. Ger. patent No. 305, 525, W. SCHMIDT and F. HEUSER, Darmstadt, July 12, 1917. **J. Soc. Chem. Ind.,** xxxix, 15A (Jan. 15, 1920). The paper pulp or the fabric is treated with tar from lignite or bituminous coal either in a fine state of division or in the form of a tar soap from whch the tar is precipitated on the fibers by the addition of acid, formaldehyde or the like. The adhesion of the tar to the fibers can be increased by the addition of resin, casein, or animal size. The tar can be resinified by the action of formaldehyde, etc., and the coloration of the paper pulp can be modified by bleaching agents. A. P.-C.

K-12. Process for the manufacture of paper coated with color. Fr. patent No. 505,369, HERMAN BAREND HALLO, Holland. Papeterie, **42, 790,** (Sept. 10, 1920). The very finely divided coloring matter is applied by blowing it on the paper. — A. P.-C.

K-12. Driving mechanism for paper winders. Fr. patent No. 505,614, BJORN EILIF FOUGNER, Norway. Papeterie, **42,** 789-90, (Sept. 10, 1920). Winders on paper machines must be driven at a variable speed, as the circumferential speed of the roll of paper must remain const. This is obtained by means of a motor of such nature that its moment of torsion increases with

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PULP AND PAPER NEWS

The past week has been one of strikes and rumors of strikes. More than 8,000 members of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers have quit work in a strike against wage reduction.

Reports from Fort Frances, Ont., indicate that the plants of the Fort Frances Pulp and Paper Company and the Minnesota and Ontario Paper Company are closed down, the men having walked out Sunday morning. Approximately 1,000 men are affected by the strike, of whom about 75 per cent. are members of the Pulp and Sulphite Workers' Union. The strike is the result of an effort by the Fort Frances mills, in association with other paper manufacturing plants, to put into effect certain changes in wages and working conditions. The companies proposed a wage reduction of about thirty per cent.; a nine-hour day instead of eight hours; straight time payment for overtime worked; and proposed also that the schedule of wages should be subject to change by either party on ninety days' notice, and that union jurisdiction should apply only to men regularly employed at manual labor inside the walls of mill structures. The unions unanimously refused to comply with these conditions. The mill owners requested the men to work until May 11, the date on which the majority of agreements between paper companies and their employees expire. The men refused to work without an agreement. No talk of a compromise is heard, and it is not expected that any change in the situation will occur before May 11. The Canadian companies whose agreements will expire on May 11 are the Abitibi Paper Company, J. R. Booth, Ltd., the E. B. Eddy Paper Company, the St. Maurice Paper Company and the Spanish River Pulp and Paper Mills.

Jobbing printers, to the estimated number of 10,000, in fifty cities of the United States and Canada, have gone on strike with the aim of enforcing a demand for the forty-four hour work week in job and book printing offices. This demand has been granted the 15,000 printers employed in the book and job printing plants in New York City. In Chicago more than 4,000 job printers struck work. In the union shops there this was not over the forty-four hour week, which was conceded by agreement, but over the rate of pay where it was installed, the employers contending that the rate of pay should be the old hourly rate, and the union leaders that it should be the old weekly rate. The employers in Chicago who maintain open shops have announced their intention of standing by the forty-eight hour week. As far as Canada is concerned, nearly 300 employees of the job printing plants at Hamilton, Ont., quit work last Monday on the forty-four hour week question; as did between 60 and 70 job printers at Vancouver; and over 50 at Halifax, N.S., while at Peterboro, Ont., where the job printers struck for forty-four hour week and a minimum wage of $38 a week (which represents an increase of $8), the Peterboro Examiner, working under open shop conditions, appeared on Monday as a four page paper. At St. John's Newfoundland two evening newspapers, the "Star" and the "Advocate" were unable to publish on Monday because of a strike of printers demanding a forty-four hour week, but the "Daily News" was issued in the morning and the "Evening Telegram", which operates on the open shop plan, in the afternoon.

Mr. G. F. Steele, general manager of the Canadian Export Paper Company, Ltd., returned last Sunday on board the "Aquitania" from a business trip to Europe. Mr. H. Biermans, president of the same Company and general manager of the Belgo-Canadian Pulp and Paper Company, is shortly going to make a business visit in Belgium.

In the course of an interview on his return from Europe, Mr. Steele gave his views on the chaotic conditions which prevail in the paper industry on that continent.

"The financial condition," he said "of the Scandinavian countries, as well as Finland and Germany, is not very happy, and the producers of those countries are under heavy pressure from their banking connections to produce and sell paper even if such forced sales entail severe losses on the producers. Of course, such a state of affairs cannot and will not continue for a great length of time. The English paper mills particularly are facing a very unhappy outlook inasmuch as it is the custom of these mills to contract for supplies of raw material for a period of a year in advance. Owing to the inequalities of exchange, foreign offerings of paper are current in England at prices far below the cost of British manufacture, and many mills are facing disaster, if not ruin. This also applies to many English newspapers, whose supply of paper has been arranged during the past for periods running through this year, and in some cases well beyond this year. Here, again, we found the unfortunate effects of fluctuating and unstable markets, which are not desirable from the viewpoint of either the buyer or the seller." There is, of course, as Mr. Steele did not fail to note, a moral to be drawn by Canada from such an erratic condition in Europe. He said quite truly that the violent fluctuations in the price of paper in the past, are largely due to causes which are now producing such unfavorable and unfortunate conditions abroad.

About a fortnight ago, Mr. E. Beck, in charge of the publicity department of the Canadian Pulp and Paper Association, sent a most admirable letter, at once forceful and moderate to some 4,000 Canadian manufacturers. He pointed out that Canada imports every year some $10,000,000 worth of paper and paper commodities, most of which could be purchased just as advantageously at home, and he took an impregnable position in laying down the proposition that a Canadian manufacturer who wants Canadian consumers to give preference to his goods because they are Canadian-made should be prepared to give preference to those of other Canadian manufacturers, including the manufacturers of paper. He appealed to those to whom he was writing to assist in wiping out the anomaly involved in sending $10,000,000 out of the country every year, to buy paper which can be bought at home to as good or better advantage, and in behalf of the Association, he asked those

who might know of any *real reason* for not giving a preference to Canadian made paper to communicate with the Association with a view to its being met. The replies so far received have been extremely gratifying, not merely in their number but in their general tenor. With unanimity those who have replied—and such replies have, in a surprising number of instances come from the chief executives of the manufacturing concerns there circularized — have admitted the force of the "Made-in-Canada" argument as applying to the paper they use in business. Some of them, of course, have used foreign-made paper by reason of an indifference which, now the matter has been brought to their attention, will probably cease to exist. Others have advanced reasons for the use of such paper, such as the alleged impossibility of obtaining the kind of paper they require in this country. In many such cases, the idea that the kind of paper required could not be obtained in Canada is erroneous and can be corrected with satisfactory results. When the idea is founded on fact, it will afford an opportunity to Canadian paper manufacturers to produce the kind of paper required. In any event, the appeal made by Mr. Beck should do great good.

Albert Gregg, Deputy Minister of Lands and Forests, at the resumption of the enquiry into affairs of the Spanish River Pulp and Paper Mills, Limited, in Toronto, last week, stated that a great deal of leniency was allowed to pulp companies by the department in the matter of dues. Large sums were often allowed to run in arrears, but interest at the rate of six per cent was charged. The witness admitted that the system led to serious losses to the public treasury. He stated that the Spanish River Company had escaped payment to the province of $37,500 per year, the total loss to the province having been about $150,000 as fire protection dues payable by the pulp companies had been reduced by the previous Minister to $6.40 per square mile. No written order was made, and not until January of this year was an order in Council validating this 50 per cent reduction made.

Premier Drury announced in the Ontario Legislature that a reorganization of the Department of Lands and Forests was in contemplation and would probably come within a month. The Liberal Leader in the House takes the stand that the services of the present deputy minister should be dispensed with.

S. J. Frame, secretary-treasurer of the Canadian Paper Box Manufacturers' Association, Toronto, has sent out notices advising the members that the organization will hold its annual meeting at the Royal Connaught Hotel in Hamilton, Ont., on Thursday and Friday, June 23rd and 24th. A large attendance of the members of the Association is looked for.

The capital stock of the Terminal Publishing Company, Limited, Fort William, has been increased from fifty thousand dollars to one hundred and fifty thousand dollars.

The Whyte Paper Company, Limited, a private company, operating on Bay Street, Toronto, has been granted incorporation by the Ontario Provincial Secretary's Department. The company is capitalized at $60,000 and is authorized to manufacture and deal in paper and all paper products.

H. W. Sherriff, of the Hodge-Sherriff Company, selling agents for the Wayagamack Pulp and Paper Company, has left Toronto on a business trip to the Pacific Coast.

Col. Thomas Gibson, of the Spanish River Pulp and Paper Mills, Limited, before the Riddell-Latchford Timber Commission, last week, made it clear that by reason of the company having erected a more extensive and costly plant at the Soo, than required in the agreement giving them certain pulp rights, the company is entitled to greater pulp areas than named in the agreement. This year the Soo mill will require 150,000 cords. Crown Counsel Dennison said that his purpose in questioning at such length the recent delimitation of the company's pulp area was to ascertain whether or not, when the boundaries were fixed, additional areas were granted to the company without competition. Col. Gibson stated that all undertakings of the company in respect of rights granted them have been fulfilled or exceeded, and therefore all areas received are legitimate. In regard to the opinion expressed by the chairman that the Government did not guarantee to supply unlimited quantities of pulpwood if larger mills were built, Col. Gibson replied that the Government had urged the building of larger mills.

Toronto members of the Canadian Paper Trade Association last week tendered a dinner to Fred Smith of Smith, Davidson & Wright, wholesale paper dealers, Vancouver, B.C., when an enjoyable couple of hours were spent.

In line with the slogan "Advance" the Canadian Paper Box Manufacturers Association, with head office at Toronto, applied for recognition by the Dominion Government in the form of incorporation. Letters patent have been issued effecting the incorporation and the notice will appear in the next issue of the Canada Gazette.

THERE IS A GRAIN TO PAPER.

As in streams or rivers, logs, sticks, etc., tend to point in the direction in which the current runs, so it is true of the small fibres, which make up the paper sheet. These, in spite of the side shake of the paper machine, have a strong tendency to follow the flow along the machine.

You can tell how the grain runs, and it is important in many phases of printing to know, by cutting two strips from the paper—one across and one with the sheet. Hold them together at one end, so that they will extend horizontally. The cross grain will have a much greater tendency to fall away. Try both on the under side, because if the strip with the grain running the long way is underneath, it will support the other.

This has a very practical application in bookmaking as books should always be made with the grain running up and down the page, not across; otherwise the book will not be flexible, nor will it close neatly, having a tendency to spring and stay open.

Another application of the knowledge, as to which way the grain is running, is of value in folding.

Cross grain folds are not as clean, owing to the breakage of the fibres. There is very slight breakage in folding with the grain.

The greatest tensile strength is always the long way, or with the grain.

If Russia and China ever reach the stage of general compulsory education, what demand there will be for paper and printing!

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a decrease in the rotary speed. Such a motor may consist of water, air, gas, or steam, turbine; and the inventor has found that a turbine working with a fluid under a const. press. gives the best results. The shaft of the turbine is geared to the shaft of the roll or drum and the rotation of the latter is quite regular, contrary to what usually happens when a friction drive is used. —A. P.-C.

K-12. Notes on the construction of papermachines. A. LAMBRETTE. Papeterie, **42**, 782-6, (Sept. 10, 1920). Machines should be built wide rather than long: the power consumption is proportional to the sq. of the length while it does not increase as fast as the width of the machine. Driers for wide machines are relatively lighter than for narrow machines. Output is proportional to the width of the machine, but it increases more slowly than the length: by increasing the length of the machine the time of starting up is increased, breaks are more frequent and take more time to fix, hitches in the running are more frequent and the work is consequently more trying on the machine crew, the work at the winder is particularly difficult. The loss of heat due to radiation is smaller on a wide machine. For high speed machines the driers should have roller—or ball-bearings. It would be advisable to use sheet steel driers with cast iron ends: these would be cheaper, lighter, and more efficient than cast iron cylinders, would reduce the danger of explosion, and would require a lighter frame to support them. The presses and calenders are frequently improperly designed, resulting either in the use of an excessive amt. of metal or in insufficient strength of certain parts. The design of the hood and the ventilating fan should be carefully studied: too much air uselessly cools down the driers, while too little air retards the drying and decreases the output of the machine. **Standardization of papermachines** and **specialization in papermaking** would in many cases result in very considerable savings.—A. P.-C.

K-18. Waterproofing Millboard. Apparatus for impregnating articles of pulp or strawboard. Br. patents No. 134,010 and 134,176. E. SLIGHT, and A. D. LACY, London, Oct. 21, 191B. **J. Soc. Chem. Ind.**, 14A (Jan. 15, 1920). The articles are first partially impregnated with a solution of casein to which formalhyde may be added if desired, in order to stiffen them and economize the consumption of the waterproofing composition, subsequently applied in the form of a mixture of wax and resin. In some cases the casein may be combined in the same bath with the wax and resin. The articles after immersion in the big bath are carried by a conveyor from one end to the other of a heated impregnating chamber, wherein the superfluous solution is collected and returned to the bath. The chamber is heater by means of a furnace, the products of combustion from which pass through a flue in the inclined hollow bottom of the impregnating chamber, throughout its entire length, and thence through the uptakes into the chamber itself. The gas-heated impregnating bath is situated at the lower end of the impregnating chamber and the products of combustion from this are likewise delivered into the chamber. The endless conveyor is preferably constructed of metal slats, the edges of which are turned over and joined together by wire links to form an endless band.—A. P.-C.

K-0. Process for removing mineral matter from paper. U. S. patent No. 1,318,902, Y. NAKAMURA, assignor to Nippon Sen-I Kogyo Kabushiki, Kaisha, Tokyo, Japan, Oct. 14, 1919. **J. Soc. Chem. Ind.**, xxxix, 15A, (Jan. 15, 1920). Paper is subjected to the action of a solvent consisting of aqua regia containing an excess quantity of HNO_3 and HF for the removal of mineral matter.—A. P.-C.

L-5. Noninflammable Cellulose Acetate Compound. U. S. patent No. 1,319,229, W. C. LINDSAY, Newark, N. J., assignor to the Celluloid Company, Oct. 21, 1919. **J. Soc. Chem. Ind.**, xxxix, 14A (Jan. 15, 1920). Acetylcellulose is mixed with phenyl salicylate and a solvent common to both.—A. P.-C.

L-5. Solutions of Cellulose. Br. patent No. 132,315 A. G. BLOXEM, London, Oct. 12, 1917. **J. Soc. Chem. Ind.**, xxxix, 14A (Jan. 15, 1920). In making solutions of cellulose by treating the material with a mixture of HCl and H_2SO_4 containing less than 39% HCl (Ger. patent No. 306,818, 1917. **J. Soc. Chem. Ind.**, xxxviii, 131A, 1919) a more rapid and complete solution is obtained by first treating the cellulose with an alkali. For instance, 1 part of cellulose is kneaded with 5 parts of 17% NaOH solution for half an hour; water is then added, the alkaline liquor is separated, the cellulose is washed, scoured, washed again, and dried. The purified cellulose is then dissolved in a mixture containing 35% HCl and 10 to 12% H_2SO_4.—A. P.-C.

L-5. Industrial research in the fiber container industry. J. D. MALCOLMSON, Univ. of Pittsburgh. Chem. Age, (New York), **28**, 321-3, (Sept. 1920). A review of the work done by the Industrial Fellow of the Container club at the Mellon Institute of Industrial Research. This included devising a satisfactory method of testing corrugated board (the Webb tester; see Pulp & Paper, **18**, 900, A-14, Aug. 26, 1920), an accurate "crack-test" for oil-cloth, a strength test for collar-button holes, a means for detg. from what part of the hide a piece of leather originated, a suitable stain for differentiating the many varieties of fibers often encountered in the same sample of container board, and various tensile tests for box board; the study of the effects of age and atmospheric humidity; a method of detg. the behavior in use of fiber containers by means of a "drum" box-tester (see Pulp & Paper, **18**, 926, L-4, Sept. 2, 1920) which gave an opportunity of studying the effect on the life of the box due to grain direction, diff. types of cans, fit of contents, methods of sealing the flaps of the boxes, various reinforcing or wt. reducing arrangements, etc.; and a study of various accessories, such as gummed tape, waterproofing agents, and adhesives.—A.P.-C.

L-7. Wool Substitute from Cellulose. Ger. patent No. 312,304, GLANSFADEN, A. G., Petersford, July 15, 1919. **J. Soc. Chem. Ind.**, xxxix, 13-4A (Jan. 15, 1920).—Artificial filaments from plastic solutions while being freed from the solvents and precipitating bath chemicals which they contain, are kept under a tension which is induced by the kinetic energy of shower baths directed upon them. For example, spun threads in the form of hanks are carried through a series of chemical and washing shower baths in such a manner that the removal of all chemicals takes place in a single passage. The gentle tension thus obtained is sufficient to prevent the thread from giving an opaque and brittle product, and the yarn is strong, soft, bulky, and possesses a slight luster like wool.—A. P.-C.

ACCIDENT PREVENTION ACTIVITY AT WINDSOR MILLS AND EAST ANGUS, QUE.

For some time past the problem of Accident Prevention has received considerable attention by the Canada Paper Co., Ltd., Windsor Mills, and the Brompton Paper Mills, Ltd., East Angus. This interest culminated last month in Safety Rallies being held at both places on the 12th and 14th inst. respectively.

At Windsor Mills the campaign was opened by holding a meeting composed of the heads of every department in the mill to discuss the best method of improving the work of the accident prevention organization. Mr. F. J. Campbell, General Manager, conducted the meeting, and during the two hours session the whole question of accident prevention was discussed with animation and many pertinent suggestions advanced. Mr. A. P. Costigane, Secretary and Engineer, Ontario Pulp and Paper Makers' Safety Association, who was present by invitation, outlined in a general way what was being done in Ontario by the Association he represents.

The following day a matinee was given for the benefit of men working on night shifts and school children. Each school in the town sent a strong contingent and when the hour of opening arrived the hall was comfortably filled. Special Safety Films were shown amid great interest and close attention by the audience.

In the evening a mass meeting of employees was held and long before the time set for starting arrived, all available space inside the hall was taken up and many could not secure admission. The pictures were followed with close attention and during the interval Mr. Campbell made a speech outlining the purpose of the meeting. Mr. Campbell was followed by Mr. Costigane, who dwelt on three phases of Accident Prevention, (1) Why Safety should appeal to employers, (2) Why Safety should appeal to employees, (3) How can results be obtained? The interests of the audience was held from start to finish and the attention given the speakers showed the natural courtesy for which the Province of Quebec is rightly famous. To give all members of the audience a chance of following the address, a resume in the French language was given by Mr. Beique, General Superintendent, and was received by the audience with hearty applause.

The program at East Angus was practically the same as at Windsor Mills, with the exception that the hall could not be secured for matinee purposes. In the evening the hall was crowded to capacity, and the pictures were again a source of great intterest. Mr. White, Chief Engineer for the Company, acted as Chairman and was followed by Mr. A. P. Costigane, who in turn was followed by Mr. Bourgauth who gave an abridged French translation of the address.

Taken all round the experiment was most successful and the interest created was well worth the trouble of organizing the meetings. There is a prospect that when the organizations in both mills are running in good shape, a friendly competition will take place between East Angus and Windsor Mills for the best accident record.

The Bedford Pulp and Paper Company has completed plans for the construction of a generating unit at its plant at Coleman's Falls, Virginia.

ENGLISH PAPER MAKER REPLIES TO CRITICS.

(Special from our London Correspondent.)

Mr. Stanley Cousins in his reply to Sir Edward Hulton and Lord Beaverbrook, whose statements appeared in the Pulp and Paper Magazine last week, says Sweden having a heavy import tariff on paper cannot commercially import from Norway, Finland, or Germany. It is not against Norway, Sweden, Canada, Newfoundland, or U.S.A. that relief is asked—they are sufferers as well from the deliberate policy of nations whose currency is varying, not from 18 to 17 and 24, but such as Germany from 20 to 260 and Finland from 25 to 160. Lest their forests fall under reparation claims, the German Government has deliberately cut and supplied pulp wood to pulp and paper mills of Germany sufficient to last them for 2 years at prices which are half the lowest figures for similar wood in Canada, Newfoundland, Sweden, of Norway. This wood is converted into paper and their requirements are sold to German consumers at a price below the cost of raw material elsewhere. The balance is sold, under license, for export and the additional price received for the exported quality is divided between the paper mills and the Government, This is not trading—it is politics and German finance—and its consequences will be disastrous to the United Kingdom and its workmen.

Finland's power to compete depends on her depreciated exchange. As long as this remains unbalanced, Finland—and not Canada, the U.S.A. or Great Britain—controls the ruling quotations, and other producers have to meet the Finnish price.

English paper mills have purchased raw materials for forward delivery in accordance with their usual practice. They are prepared to stand the loss involved by liquidating these stocks purchased at high prices if they could run their mills full time. Sir Edward Hulton and Lord Beaverbrook, adds Mr. Cousins, must be aware that many British and Irish publishers have bought foreign newsprint paper for forward delivery over 1921 at prices nearly double that at which British mills are selling today. These paper contracts were made during 1920 with mills in Norway, Sweden, and Finland. Newspaper publishers usually purchase ahead in order to ensure their supplies of paper and they are no more subject to criticism than the British paper mills are for purchasing their pulp supplies for forward delivery.

Given an even start British mills can produce and deliver their paper to the printing presses in Great Britain at a price as low as can be made by any other producing country, as has long been proven. Dumping of foreign surplus production and competition from countries with depreciated exchange debar British mills from a fair start. British industry is entitled to expect that this unfair competition be balanced either by a temporary import duty or by corrective exchange regulations. This is all the British paper industry asks.

Mr. Stanley Cousins says the entire trade is suffering—newsprint consumption being only one-third of the total paper used.

A forest fire which swept the outskirts of Lake Placid, N.Y., last Saturday called out more than 500 volunteer fire fighters. The blaze spread to a large area of valuable timber land and for a time threatened to destroy Lake Placid village.

UNITED STATES NOTES

The Harding Administration is seeking a solution of the country's print paper problem, through the development of Alaska's wood pulp resources. The matter came up for discussion at a Cabinet meeting in Washington last week. Among suggestions advanced was one proposing the establishment of a ship line between Seattle and Seward, a proposal which is expected to receive the consideration of the new Shipping Board. According to Col. Greeley, chief forester, who completed a survey of the territory recently, there is sufficient pulp wood in Alaska to furnish perpetually one third of the print paper consumption in the United States. This could be laid down on the Atlantic seaboard on a basis of between three and a half and four cents per pound, based on present rail freight rates, and practically one cent a pound by water.

Albert E. Ehlman, William F. Wolf and Julius E. Kiefer are named as incorporators of a new paper company recently organized in Winconsin to be known as the Valley Paper Mills. The capital stock of the concern is $1,500,000, consisting of 150,000 shares of $10 par value each. The incorporators are well known to the trade in Wisconsin and the Lakes region. Mr. Wolf formerly was an Appleton resident, and recently has been engaged as a stock and bond salesman. Several sites in Neenah are under consideration for the company's plant. It is understood that paper novelties are to be the chief product.

Members of the Connecticut Valley branch of the Technical Association of the Pulp and Paper Industry at a meeting held recently at Holyoke, Mass., heard an interesting address relating to the present status of the country's dye industry. The talk was by W. F. Van Riper, of the E. I. DuPont Company, Wilmington, Del. Mr. Van Riper said that American manufacturers are now producing more than 90 per cent of the known dyes. The remaining 10 per cent may be processed, said Mr. Van Riper, if Congress passes protective legislation so that capital for plants and machinery needed will be forthcoming. Research work in laboratories has led to a development making possible the manufacture of practically all known colors and grades of dyes. At the present time, according to Mr. Van Riper, the industry is handicapped by the lack of certain necessary chemicals which are not now produced in large enough quantities because of their non-profit bearing nature. With the making of these chemicals placed upon a profit-bearing basis, and the passing of protective legislation, Mr. Van Riper predicted that the American dye industry would get an impetus greater even than the advance of the last few years.

Means for the protection of the chemical and dye industry are even now under consideration in Congress. Senator P. C. Knox last week offered an amendment to the emergency tariff bill providing for six months' extension of war control of the industry. The suggestion was favorably reported by the Senate Finance Committee. Its effect will be to put an embargo on German and other foreign products. It is provided that the present War Trade Board in the State Department, which controls the dye situation by a licensing system, shall be transferred in to the Treasury Department, which shall administer it until more adequate protection can be given to the American dye industry by the permanent tariff bill.

A bill proposing a government operated paper mill has been introduced in the House of representatives by Congressman Baker of California. This measure is similar to one that was buried in committee at a regular session of the 66th Congress. It "authorizes and directs the public printer to provide a pulp and paper mill or mills for the manufacture of print paper for the government and for other purposes." The bill has been referred to the committee on printing. It is hardly likely that it will be reported to the floor of the House for action. It probably will be pigeon-holed in committee, like the last measure of the sort.

According to a report received at Washington, paper is so scarce in Russia that a special Soviet Government institution has been created in Moscow and other towns to deal with the shortage. Thousands of women have been employed by the Government, says the report, to search in old archives and record offices for clean sheets of paper, or paper used only on one side, which may be utilized for Soviet official correspondence.

E. Gordon Filer, the well known Michigan sulphate manufacturer, banker and industrial captain, died in Chicago recently, at the age of 81. Mr. Filer, who was president of the Filer Fibre Company, had large holdings in many big concerns, industrial and commercial, both in and out of Michigan. He was a pioneer in the development of the "White Pine" industry in Michigan. The Filer Fibre Company is recognized as one of the best sulphate mills in America, if not the largest.

Figures compiled by the Department of Forestry of the New York State College of Agriculture indicate the rapidly increasing interest in forestry on the part of farmers of New York State. A total of 529 persons attended lectures, demonstrations and round tables dealing with forestry problems this year compared with 341 last year at similar gatherings and 247 in 1919.

Interests of the International Paper Company who sought to prevail upon the management to establish the common stock on a dividend basis were disappointed at the annual meeting held at Corinth, N.Y., last week. Malcolm G. Chace, who with Henry A. Wise, led the minority interests, is revealed as probably the largest stockholder in the company. A total vote of 369,546 was cast, 245,624 for the "regular" ticket, backed by President P.T. Dodge, and 123,922 for the opposition. The directors were re-elected with the exception of A. M. Burbank, who was succeeded by Herman Elsas. Commenting on the possibility of dividends on the common stock, President Dodge said he wished to go on record as saying that the present management does not wish to ignore the claims of the common stock holders and was not opposed to a dividend on the junior issue, but until it was considered safe to divert money now necessary for improvements and extensions no dividends could be paid on the common.

Beware of desperate steps. The darkest day, lived till to-morrow, will have passed away.—Cowper.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, April 30.—In these days of trade depression the pulp and paper industry is not escaping unscathed but there are branches of industry far worse off. There is no doubt that those engaged in the pulp and paper trade have been passing through a trying period, but in no other line of manufacture is there greater optimism for the future and greater faith in the ultimate emergence into a position closely akin to that which has existed during the fat years of the industry. Most of the companies are in a good position, notwithstanding the general trade depression and the difficulties met with in disposing of stock, and if business generally is dull, it is taken as part and parcel of the general scheme of things at the present time. Here and there in the pulp and paper trade there are evidences of brightening up in selling conditions, although there is an extremely dull market for raw paper stock. A considerable amount of pulp continues to pile up at a number of the mills and manufacturers are finding it difficult to dispose of it. Comparatively few transactions are taking place. On the other hand some of the jobbers report slightly better sales in some lines, notably kraft, and there are signs that somewhat freer buying of a number of lines of paper is taking place.

KRAFT.—There is a distinctly more buoyant tone to the kraft paper market, one mill reporting that the present month has been the best of the present year as far as sales go. Buying, which was very restricted during the past several months, is now resuming, and the fact that stocks are low is having something to do with forcing users of kraft paper into the market. Kraft has undergone a great development during the past few years and is now being very extensively used in various mercantile lines. The market, which has been very quiet of late, appears to be coming back nicely and the timidity in buying, which has characterized the trade for some weeks, appears to be lessening. During the past several weeks there has been a satisfactory improvement in the trade and dealers and manufacturers say that the present prices are likely to remain firm for some time to come, if not permanently. One manufacturer of kraft paper declared that with the present cost of labor, the chemicals in stock bought at high prices and other conditions, it would be impossible to effect any further reductions without going below the cost of manufacture. Kraft pulp is still quoted at $80 and kraft paper at 10c per pound.

BOOK AND BOND PAPERS.—Manufacturers and dealers in these lines report little change in the general situation which is one of extreme dullness with orders of small dimensions. Many of the mills are running light and there is little call for goods by the jobbers and distributors who have found the demand by the consuming public very light. There is some prospect of competition from the United States bond paper manufacturers, there being an era of price cutting across the line which appears to be having its effect on the Canadian market. Canadian jobbers, it is known in some cases, have been doing considerable cutting of prices with a view to getting rid of some of their surplus stock and turning it into money and it is on record, as showing the poor demand for paper, that one jobber marked down a cheap line of bond to almost a give-away price and could not dispose of it. He found that another firm had gotten in ahead of him with an offering of cut-rate paper and got what little business there was in that line. As showing the lessened volume of orders coming through it might be mentioned that the book paper mills now hold orders from the jobbers until they get a full carload and then ship. Carload lots to jobbers are somewhat rare.

WRAPPING PAPERS.—No one is buying wrapping paper beyond a few days requirements and Canadian mills and jobbers see little prospect of an immediate improvement in what is turning out to be a very quiet season in this line. Orders continue to be of small proportions and no one, either jobber or consumer, cares to take a chance on stocking up owing to the unsettled condition of trade. There have been no changes in the prices of wrapping papers during the week.

FLOUR SACKS DOWN.—The week saw a reduction of from fifteen to twenty per cent in the price of flour sacks. Some sample prices follow: 3½ lb. bags, rope, $6.50 per thousand, plain or $8.00 per thousand or less, printed one or two inks, while the price for white, blue lined is $7.50 and $9.00 per thousand. Fifty pound sacks, rope, are $46.00 and $47.50 and $50.00 and $51.50 for white, blue-lined. For printing extra colors not provided for in the list $1.50 per 1,000 or less than $1.00 for each additional color and a like additional charge for any printing on back of sack, will be charged. The trade discounts are 2 per cent on 5,000 and over: 3 per cent on 10,000 and over and 5 per cent on 25,000 and over.

WAXED PAPERS.—Manufacturers of waxed papers report a satisfactory improvement in trade, particularly in lines used by the confectioners, which is due to the advent of warmer weather. Prices of waxed papers have dropped from twenty five to thirty per cent since the paper slump set in and some of the firms are under the handicap of turning over high-priced stock which was bought when the paper industry was on the high tide. The general outlook for trade in this line is fairly bright.

GREASEPROOF AND CASINE.—Business in these lines is very dull although some trade is being done in a small way. The prices remain unchanged and the demand light.

LIGHT WEIGHT PAPERS.—Cautious buying still characterizes the tissue, toilet and light weight paper trade is somewhat unsettled owing to uncertainty as to what future prices are going to be. No dealer or consumer has any stock to speak of and the sales that are being made are of small proportions. A fair amount of business is being done in toilet and tissues but no one is placing large orders. Prices remain unchanged and it is thought in some quarters that they have reached a fairly stable basis.

RAG AND PAPER STOCK.—Cotton rags were in little demand last week and the market was entirely

devoid of trading features. Few consuming mills came into the market as buyers, and offerings by dealers and brokers invariably met the response from manufacturers that they were not in want of rags for present requirements, and were not willing to anticipate future needs. There was very little change in values. Prices at best are nominal, and a few transactions were reported at about the same figure previously recorded. Waste paper of all grades continues very dull. All prices quoted are merely nominal, there being not enough business transacted to establish a firm market on any grades.

	Per Cwt. f.o.b. Toronto.
No. 1 shirt cuttings	$10.00—10.50
No. 1 unbleached cotton cuttings	6.00— 7.00
No. 1 fancy shirt cuttings	6.50— 7.00
No. 1 blue overall cuttings	6.00— 7.00
Bleached shoe clip	8.00— 8.50
White cotton hosiery cuttings	10.00—10.50
Light colored hosiery cuttings	9.00—10.00
New Light fglannellette cuttings	8.00— 8.50
No. 2 white shirt cuttings	6.00— 6.50
City thirds and blues (repacked)	1.30— 1.40
Flocks and satinettes	.70— .80
Tailor rags	.60— .65
Gunny bagging	.80— .90
Manila rope	2.75— 3.00
No. 1 white envelope cuttings	2.75— 3.25
No. 1 soft white shavings	2.50— 2.75
White blanks	1.40— 1.50
Heavy ledger stock	1.75— 2.00
No. 1 magazine	1.50— 1..60
No. 1 book stock	1.00— 1.20
No. 1 manila cuttings	1.50— 1.60
No. 1 print manila	.70— .80
Folded news	.50— .60
Over issue, news	.75— .90
Kraft	140— 1.50
No. 1 clean and mixed papers	.30— .40

NEW YORK MARKETS.

New York, April 30—(Special Correspondence). — There have been few changes of importance noted in the paper market here this week but those that have occurred have been mostly of an encouraging character. Demand for at least some grades of paper seems on the rise. Consumers and merchants continue to buy only against immediate requirements in a large majority of causes, and yet, there are signs indicating that the market is on the mend and that it is gradually taking on a livelier complection. Moreover, a feeling of increased confidence in the stability of prices seems to exist, and there is no doubt that as quickly as general business conditions improve, thus leading to a greater consumption of paper, demand for paper of various kinds will immediately expand in like proportion as it is mostly conceded that stocks in the hands of consumers are considerably below what they usually are.

For the first time in quite a lengthy period an advance in paper prices in at least one certain instance has occurred. Manufacturers of tissue paper who have for some weeks been quoting 85 cents per ream on No. 1 white tissue, basis 20 x 30, and the same figure on No. 2 white and No. 1 manila, 24 x 36, have announced an advance of 10 cents per ream to 95 cents. Offerings in the trade by jobbers and secondhands are still made at the lower figure, but mills are reported holding firmly for the higher price, and seem determined to hold out for the price wanted, which they undoubtedly will obtain as soon as some of the cheaper priced tissue is removed from the market.

The threat of a strike of mill workers has tightened up the newsprint market. Prices are in about the same position but there has been considerable more demand from publishers, who in numerous cases have placed orders for quick deliveries so as to insure their requirements over a longer period. Leading producers of newsprint are not making commitments covering deliveries during the next few weeks, excepting, of course, subject to the strike. Present indications are that the strike will be declared, yet both consumers and manufacturers are taking a sane view of the situation and are quietly awaiting developments. It is generally recognized that present stocks of newsprint are ample to cover publishers' wants for quite a period and it is commonly felt that a strike cannot be maintained for any appreciable length of time under prevailing industrial conditions.

The spot market for newsprint is firmer in tone but quotations have failed to change. There are spot lots of roll news available at 5 cents and less per pound, and publishers have confined their buying chiefly to the limited-sized tonnage to be had at the low edge of prices. Contract quotations are maintained, but with few manufacturers quoting.

It is understood that board manufacturers are taking steps seeking to stabilize the market for their product. For some time past competition among board producers has been so keen that prices have been pushed down to a level where mills have been obliged to operate at a loss. Now, it is said, manufacturers are closing down their plants rather than continue making board to sell at less than the cost of production. Boxmakers are experiencing dullness in their trade and board manufacturers are commencing to realize that ridiculously low prices will not induce consumers to take any more board than they actually require. Most mills are quoting a minimum of $30 per ton f.o.b. their shipping point on plain chip board and $35 on filled news board, and while purchases can probably be effected at lower levels, it is stated that a majority of producers are insistent on these figures. As an instance of how low board values have sunk, it can be said that sales of chip have actually been recorded by Eastern mills within the past few weeks down to $22 per ton. Obviously, under prevailing circumstances, board cannot be made at this price at a profit for the manufacturer.

Fine paper rule quotably steady and there is a moderate business transpiring in the lower-priced lines. Printers and jobbers are buying cautiously but on the whole are absorbing fair amounts of bond and ledger papers. Wrappings are quoted at a basis of about 7 cents on No. 1 domestic kraft and are moving in a more or less steady way though in limited volume.

GROUNDWOOD—There is little activity in the mechanical wood pulp trade, and it is indeed a difficult matter to ascertain what market values are. Prices today depend in large measure on the individual transaction, on how anxious the seller is to move pulp or how keen the buyer is to acquire supplies. Some manufacturers, and it can be said most of the larger producers are holding rather firmly for the quotations named and seem satisfied not to effect sales unless securing the figures asked, whereas others are letting go of ground wood at surprisingly low prices. Offerings of prime spruce pulp have been made in the New



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York market at $25 and less per ton at grinding mills, with at least one concern offering No. 1 ground wood at $30 delivered to mills in the vicinity of New York. On the other hand, a more general quotation is between $30 and $35 a ton at producing plants. The market is very unsettled, with no definitely established price basis existing.

CHEMICAL PULP.—Demand for chemical wood pulp is slow and current business is very spasmodic and at the best involves but a small quantity of pulp. Papermakers are coming into view only when in actual need of a limited amount of this or that grade of pulp to augment contract deliveries, and in most cases evince no interest in offerings when not in direct want of supplies regardless of the prices quoted. Quotations are strictly nominal. It is a fact that consumers are enabled to buy from both domestic producers and from importers and substantially lower figures than sellers invariably name, indicating that at least some holders of stock are pressed to liquidate for whatever can be realized today. There have been reports of sales of foreign unbleached sulphite of No. 1 quality on the spot here at $75 per ton, while it is stated on good authority that one of the principal domestic manufacturers of bleached sulphite is offering such pulp at 5 cents a pound, or $100 per ton, at the pulp mill. News grade sulphite is freely offered at 3.50 cents per pound but it seldon fetching above 3 cents in actual sales.

RAGS — The light demand for papermaking rags from consuming quarters coupled with the flow of spring collections in from country sections, and a resultant accumulation of stock in dealers' establishments, makes for a very easy price tone. As a matter of fact, there is hardly an established market price on any grade of papermaking rags at present. Some dealers who are in a favorable financial position are holding firmly for the figures quoted while others are disposing of stock at whatever they are bid. Prices in general display a downward trend, with almost every sale of any importance recorded made at a lower level.

Roofing rags are available to felt mills at 75 cents per 100 pounds for No. 1 packing and 65 cents for No. 2 grade at shipping points. Old thirds and blues are offered at as low as 1.75 cents a pound for repacked and 1.15 cents for miscellaneous packing. Old whites are quotably off at around 6 cents for No. 1 repacked with No. 1 miscellaneous packing available at 4.75 cents, house soiled at 1.75 cents and street whites at 1.50 cents. New cuttings are irregularly priced with every probability favoring buyers securing wanted supplies at below the figures asked.

News From Our Advertisers

SLITTING AND REWINDING PROBLEMS SOLVED FOR THE PAPER INDUSTRY BY SPECIALIZATION. VIEWS OF MR. CAMERON OF CAMERON MACHINE COMPANY.

In commenting on the results achieved in the designing of standard and special types of Slitting and Rewinding Machines for service in the Paper Trade, Mr. Cameron chose as a summary the results during the last ten years.

It was not so long ago that the requirements in the Slitting and Rewinding line were of secondary importance to paper manufacturers, and rolls produced by the various types of Slitting and Rewinding Machines then available were satisfactory both to the mill and to the customer. The customer was not apt to be over critical as to the character of the rolls themselves as long as the quality of the paper was all right. The standards as to these requirements have constantly and rapidly advanced both in the matter of firmness and evenness of rewinding, accuracy of width and other features; including, also, a demand for rolls and coils in a range of sizes practically uncalled for ten years ago in any appreciable quantity. The average mill would supply rolls in a comparatively narrow range of sizes; but the more progressive mills these days are called upon to furnish rolls in any size from "midget" to "jumbo," both as to width and diameter. A sixty inch diameter roll of jute or chip-board seems to be in line with the modern demand for manufacturers of container board, corrugated paper products, etc.; while other mills or converters are confronted with a demand for midget rolls which might rival a lead pencil in diameter or a peppermint lozenge in width.

Owing to the introduction of a hundred and one processes of new invention in which roll paper is used; as, for instance, in Web Printing Machines, Bag Machines, Automatic Wrapping Machines, Adding Machines, Recording and Registering Machines, Paper Yarn Spinning Machines and a host of others, the manufacturers of Slitting and Rewinding apparatus have been put to it to keep abreast of the demand—and Cameron Machine Company have earned and deserve a reputation for various types of Slitters capable of meeting the rapid developments in the market requirements.

Aside from the enormous consumption of paper in roll form for supplying automatic machinery such as is mentioned above, there is a huge demand proceeding from the consumers of paper in roll form for such as store counter rolls, also for the purpose of ribbon

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blocking, wire insulation, blasting, barber-headrest rolls, etc.—a list too numerous to mention specifically. Along with these demands has gone a constantly advancing standard on the part of the customer as to accurate, clean-cut work at a minimum of expense in converting the original webs into the size of rolls required.

In adding themselves up covering a period of the past ten years, Mr. Cameron pointed to the achievements of his concern by referring to one of their smaller models of Slitter and Rewinder for the production of midget rolls which they had built for Anthony Eisler & Company, New York City, a little more than ten years ago. The contrast between this little machine which seemed so puny when the illustration was laid beside a photograph of the Heavy Duty Rewinder, CAMACHINE-18, emphasized very forcefully the range of development wrought out by their Company leading up to the production of what they call their Type-18 Mill Rewinder.

Back of this development there is a history of consistent effort, day by day, month by month, and year by year, always directed toward Slitting and Rewinding Machine production. In passing from the stage of development where their shop was capable of producing only the small types of Rewinders up to the point where the line offered the trade covers the complete range of requirements, up to the heavy duty work accomplished by CAMACHINE-18 in direct connection with Paper-Making Machines, or converting requirements for heavy work in the Finishing Rooms, there were ten full years of steady plugging on the part of the designers, the chop crew and the cashier—not forgetting the cashier because the problems of ways and means for a business which has grown out of its own efforts from year to year, are enough to turn the cashier's head grey, unless it is already bald to start with.

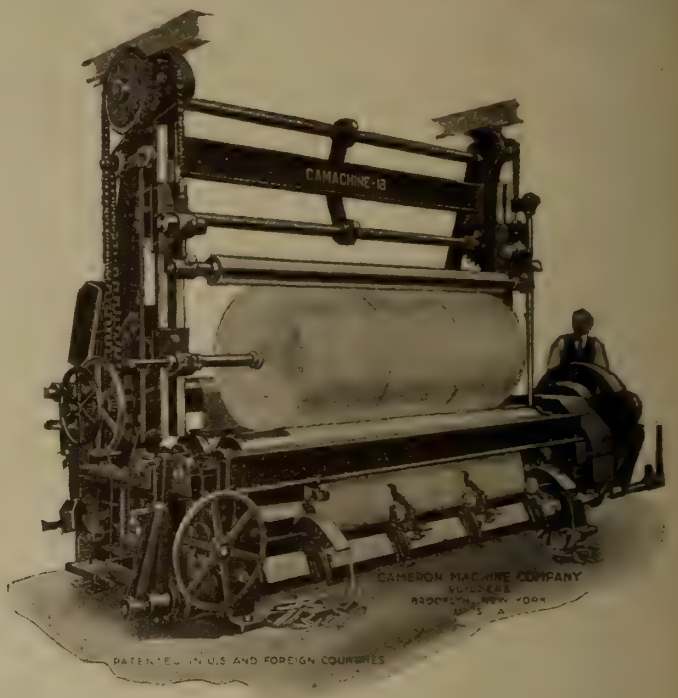


Prior to this ten years of history which are here commented on, there are ten preceding years which can be summed up in a few words; as those ten years were spent in "Learning How."

Following the "midget" machine built for Anthony Eisler, there was a series of machines growing out of same and culminating in the present-day, "CAMACHINE-18." Substantially the same basic theories wrought out in the first ten years of effort and incorporated in the smaller machines have been carried forward and amplified year by year until the goal of a fast running, heavy duty machine for dependable service in the Machine Room or Finishing Room of Paper Mills was reached—a long road to travel.

Any real success worth having is never cheaply bought; but it was an impressive statement that it had always been the policy of the Cameron Machine Company to submit their machines subject entirely to the approval of the user to accept or reject as its merits might warrant after an actual and practical trial of the machine in the hands of the customer for whom it was built. The claims made for the machine could always be justified and checked up by the user on the assumption that he had a right to know what his money was spent for; and if the service of the machine did not justify the expense, there was nothing more to say.

Realizing many years ago that the field for various types of Slitting and Rewinding Machines was a very important one requiring special study, Mr. Cameron



stated that his associates and himself came to the conclusion that more would be gained in the long run, both in dollars and in good-will, by devoting their energies solely to this line. The results have justified this policy both technically and in volume of business.

It occurrs to us that perhaps this is a proper time to consider three important things: first, the replacement of old and inadequate equipment for roll production; second, the extension of present facilities to cover a wider range of work; third, the application of labor-saving and cost-reducing methods to meet strenuous competition by increasing both the quality and quantity of product.

BULLETINS RECEIVED.

Among the most attractive and complete catalogs that we have received recently should be mentioned those just sent by the Canadian Ingersoll-Rand Company, 260 St. James Street, Montreal. One set shows the well known Cameron pumps and includes centrifugal, direct acting and multi-stage pumps. The illustrations are exceptionally good, not only of the diagrams showing the principles, but also those showing the assembled pumps and their typical installations. Perhaps of more particular interest to readers of the Pulp and Paper Magazine is the series which includes the Ryther Slasher system, the Paulson Barking Drum and Bark Press, the Ryther Chip Screens and the Bird Pulp Screens and Save-all. Copies of these bulletins will be sent to executives desiring them on application to the company.

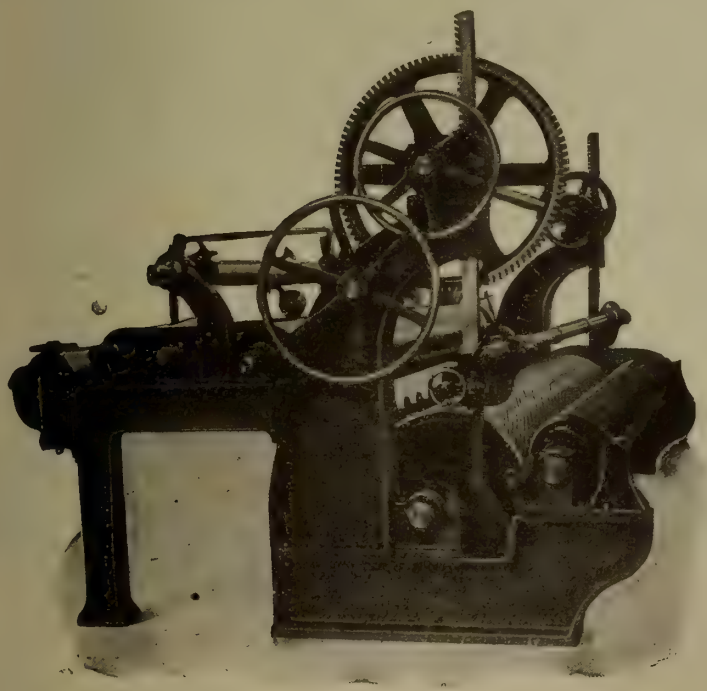
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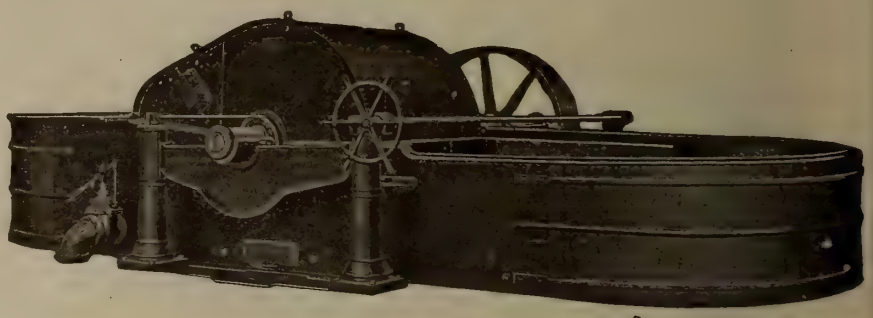
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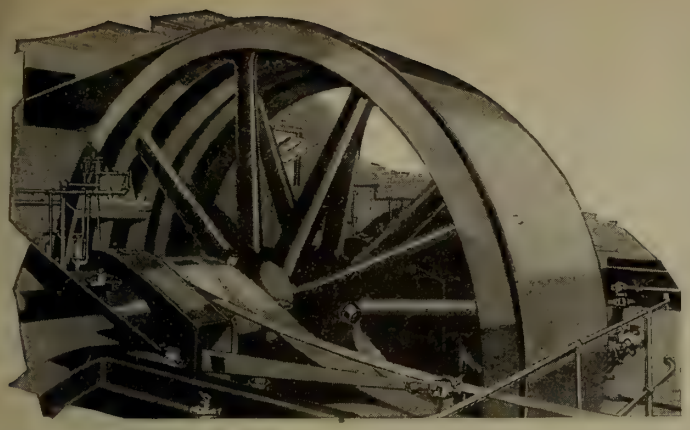
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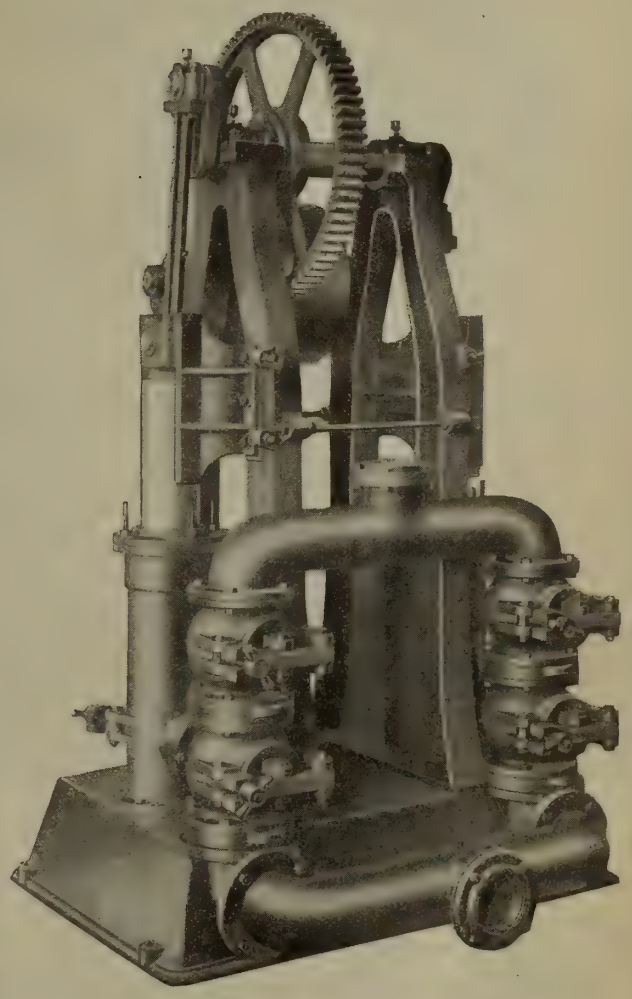
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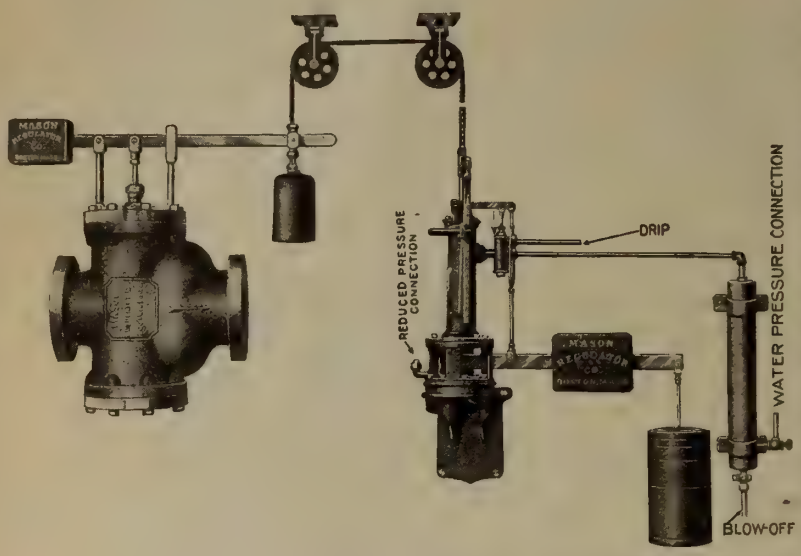
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VOL. XVIX. GARDENVALE, P. Que., May 12th 1921. No. 19

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building.
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

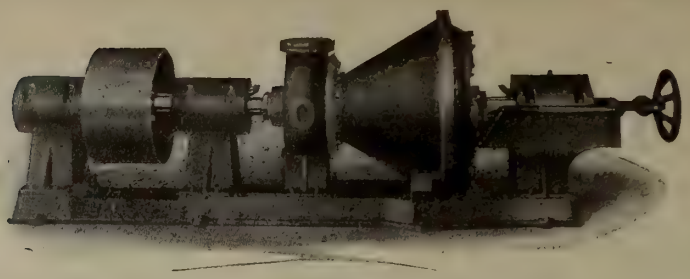
Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc. Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

THE RIORDON STATEMENT.

The Pulp and Paper Magazine seldom comments on financial matters. In the present instance the case is one that affects several groups of people. The situation has not been entirely clear, but the long-expected Riordon statement has at length been issued and the announcement of the actual state of affairs is gratifyingly frank and clear. It assumes the form of a report to the shareholders over the signatures of Mr. F. P. Jones, Senator W. C. Edwards and Messrs. F. E. Bronson, George M. McKee, and F. N. Southam. These gentlemen it appears, were recently appointed a committee of Directors to examine into the affairs of the Company and report on its financial position and requirements and to make recommendations.

Ths committee reports that the financial position of the Company is serious and that unless further working capital can be secured immediately it will not be able to continue business. As a result of the committee's investigation of the affairs of the Company, it has come to the conclusion that its present position is due to commitments for construction and other expenditures having been undertaken before adequate financial arrangements were made. Further, mention is made of the world-wide reaction in trade conditions generally, and of the falling off in shipments and receipts during the last five months. At the same time, the committee is of opinion that the position of the Company is fundamentally sound provided additional working capital can be obtained, and it makes an urgent appeal to the shareholders to furnish part of the additional working capital required to enable the company to meet its liabilities and continue a business which, with adequate working capital, should continue profitable.

As regards the manner in which the committee proposes that the additional capital should be raised, the method decided on is that the Company shall forthwith authorize an issue of $5,000,000 Ten-Year 8% Mortgage and Collateral Trust Bonds, to be dated June 1st, 1921, and to be secured by a specific mortgage and charge on the fixed properties, plants, and timber lands of the company (subject to the bond issues and mortgages mentioned in the balance sheet), and by a first pledge and charge by deposit with the Trustee for the bondholders of $6,000,000 of 8% Ten-Year Refunding Mortgage Bonds to be created by the Gatineau Company, Limited, and issued to the Riordon Company in payment and satisfaction of advances heretofore made by it to the Gatineau Company, Limited. The Riordon Ten-Year 8% Mortgage and Collateral Trust Bonds will be further secured by a floating charge (subject as aforesaid) on all the other properties and assets of that Company. They will rank ahead of $47,000,000 par value of Preferred and Common Shares of the Company.

The bonds of the Gatineau Company are to be pledged and deposited with the Trustee as security for the 8% Mortgage and Collateral Trust Bonds to be issued by the Riordon Company will be secured by specific mortgage and charge on the properties of the Gatineau Company, consisting of all the real estate and sawmills of that Company at Ottawa, Hull and Rockland, freed old water power rights on Gatineau, Nation and Lievre Rivers, and by assignment of over 8000 square miles of pine and pulpwood limits purchased by that Company through its acquisition of the businesses of W. C. Edwards & Company, Limited, and the Gilmour & Hughson Company, and a floating charge on all the other properties and assets of the Company, subject to purchase money mortgages for $5,000,000 which mature 1925 and $478,553 now due and bank liens. The Trust Deed securing the bonds will provide for the refunding of these mortgages at par.

It has also been arranged that a Voting Trust be created, by which voting control of the shares of the Company will be placed for a period of five years in the hands of five Voting Trustees to be nominated by the Bankers interested in the Company and its securities. The Voting Trust agreement will be completed to the satisfaction of the signatory committee before allotment.

On account of the urgency of the situation and as an inducement to the First Preferred Shareholders to subscribe for the Bonds above mentioned, all the holders of the 7% Cumulative Convertible (Second) Preferred Shares of the Company have agreed to surrender pro rata to the subscribers to the Bonds a sufficient proportion of their holdings to provide a bonus of $750 par value of the said 7% Cumulative Convertible (Second) Preferred Shares for each $1000 of the Bonds so subscribed and paid for, and the shares necessary for this purpose have been deposited with the Montreal Trust Company.

Whether the shareholders will make an adequate response to this appeal or not remains to be seen. For ourselves, we take the view that, in their own interests, they would be well advised to bear their part in providing the additional capital required. It was not by any means without reason that last month, when the position of the Company first became the subject of general discussion on the street, we published a special article

on its strength. In the article in question we emphasized the value of the physical assets belonging to the Company. This aspect of the case must be fully borne in mind by any one who would fairly judge of the company's position and the probability or otherwise of its surmounting its present difficulties. In proportion to its assets, the bonded indebtedness of the Riordon Company is very far from excessive and this fact should render it less difficult, than might otherwise be the case, to arrange a new issue of bonds. The earning power of the Company has been proved for many years past to be very large indeed. The product is required for the manufacture of high grade papers, the temporary slump in the consumption of which is largely responsible for the present decrease in income. The very name of Riordon has long been recognized as being synonymous with the most excellent quality of product. As we pointed out in the article to which we have just referred, the Company's properties, mills and timber lands, and those of its subsidiaries, are believed to be the largest and most valuable of their kind in Canada under one control. The Board of Directors — very wisely in the circumstances — pledges itself to a policy of rigid economy in operations and to discontinuance of construction as far as possible.

The Company's barque is passing through troubled waters. But it is our opinion—and we offer it only for what it is worth—that there are clear seas ahead. No doubt, one of the causes of the present trouble is the fact that the construction expenditure on the Kipawa plant exceeded the original estimate of cost. But we believe that informed opinion is to the effect that, when the Kipawa mill is working to the full, it should be able to carry all the charges incident to the Company's financing—both that financing which has already taken place and also that which it is now being attempted to carry through. We see no reason to doubt the accuracy of the committee's estimate of the position of the Company as fundamentally sound provided additional working capital can be furnished forthwith. And for the sake of a concern which has long borne an honored name in the Pulp and Paper industry, for the sake of the shareholders themselves, and for the sake of the industry as a whole, we heartily wish the Committee of Directors success in the appeal which they are making to the company's shareholders to subscribe for the present issue to the limit of their ability. This Company is but a unit of the Pulp and Paper division of Canada's industrial forces. This division is largely bearing the burden of maintaining Canada's economic position and every unit in it must be kept as an effective force for the commercial struggle in which the Dominion will play an ever increasing part.—A. R. R. J.

The Brompton News prints the cheerful news that the sulphate mill at East Angus is a very busy place. Congratulations!

BREAKING RECORDS IN DULL TIMES.

While many paper manufacturers have been lamenting the dullness of business and many mills have been running only part time, the biggest individual paper mill in Canada has been making records in production. The Abitibi mills on their four machines on April 20th produced 270.39 tons of newsprint at an average operating efficiency of 98.1 per cent. This record did not suit the ambitious crew so on April 21st they made 271.11 tons and on April 28th 273.54 tons, which represents an operating efficiency of 98.9 per cent. Perhaps the most remarkable feature of this day's work was the running of one machine for twenty-four hours without a single break. We have information that the Donnacona Paper Company has made a similar record for running without breaks but we have not had our attention called to such a record as this for maintained production. According to the Broke Hustler, which keeps the people of Iroquois Falls in touch with what is going on in that interesting town, the production in pounds per inch of trim for April was maintained at 793 pounds. This gives a figure which forms a basis comparison with the production of any other paper machines. It is gratifying to note that beginning with 1915 the averages for the past six years consistently grew by the following steps; 533, 613, 637, 662, 679, 711 pounds per inch of trim until now April has set a basis which if maintained for the year will give the Canadian Pulp and Paper Industry a performance to point to with pride.

A reader of the Pulp and Paper Magazine wants to know how to line up a cylinder machine. The best answer will be printed and paid for. How do you do it?

COBWEBS.

Canadians will read with interest the account of the annual meeting of the British Papermakers Association. Their problems are, for the most part, quite different from ours, but there is much in common and many points of contact. The growth of the British Technical Section is phenomenal. In this connection, we are led to wonder how they bleached out all semblance of Empire preference and "establish relations with the corresponding American association" without so much as approaching their Canadian cousins.

The Spanish River News would be quite a paper if it published only announcements of births and marriages.

Some people, like some horses, only require to be put up against a hard proposition to concentrate their energy and pull out successfully.

It looks as if a lot of papermakers would have a long vacation. Perhaps they don't realize that some manufacturers' profits and chance of profits have already disappeared. Others may have long contracts.

Control of Alum Content of the Tubsizing Bath

By P. W. CODWISE.
Byron Weston Co., Dalton, Mass.

The manufacture of certain high grade papers has, from earliest times, involved an immersion of the dried sheet in a bath of sizing material. Since this sizing agent was contained in a tub, into which the paper was dipped, the process became known as tub sizing. The term is now generally applied to all papers which have been treated to a second sizing, and includes the majority of the so-called fine papers.

In view of the many years for which this process has been used, the literature upon the same is very scant; this being especially true in regard to that of a scientific nature. The tub sizing bath is usually a solution of animal size, that is, of gelatine, in water, and of sufficient strength to impart characteristic qualities to the sheet treated with it. At the present time, various starch products are used to some extent in this connection, but gelatine still continues to hold first place.

In the making up of the size bath, it is customary to incorporate a certain amount of alum, that is aluminum sulphate, with the gelatine solution. This is done for a variety of reasons, among which may be mentioned the prevention of the solution from souring, and according to Cross & Bevan (1), the rendering of the gelatine resistant to ink. The amount used may vary within large limits, as from a mere trace, to 10 per cent of the solid matter, and possibly higher. It is now necessary to point out that the incorporation of even slight amounts of alum with this bath has a decided effect upon its physical properties, and that the actual amount present as such should be known in order that efficient technical control may be established. This article describes a rapid volumetric method of estimating the excess of alum present in such a solution of gelatine.

When developing such a test, we find that certain factors limit us greatly in the selection of chemical indicators. The first of these is the disturbing action of gelatine itself upon the majority of them. In fact, the only important indicator which, up to very recent times, has been considered of value for glue testing, is litmus, used in the form of blue litmus paper. At present, an indicator is available which is superior to litmus in many ways, while having its color change at nearly the same point of hydrogen ion concentration, that is, close to the neutral point, or hydrogen ion concentration of 10^{-7}. This is the substance commercially known as Brom Thymol Blue and the chemical name of which is dibromothymolsulfophthalein. It is one of the brilliant indicators recently synthesized by Clark and Lubs (2)

The other factor involved is the action of aluminum sulphate toward these indicators. That litmus is useful in estimating alum is shown by the fact that Baeyer's original volumetric method made use of this indicator for determining the total acidity of the alum (3). However, it was later shown that indicators of a different range were more suitable in this connection. We find, therefore, that it is necessary to use a correction factor to take care of the error inherent to an indicator having such a working range, when used with aluminum sulphate. By using such a factor, brom thymol blue can be employed to good advantage for estimating the total acidity of the alum present, which we are seeking.

Brom thymol blue (4) is a yellow substance which is turned to a brilliant blue by active alkalies. It has, however, intermediate color changes, as it tends to pass from the yellow to the yellow green, then to the blue green and finally to a blue. It is the change from the yellow green to the blue green with which we are to be concerned in the present case. This substance is superior to litmus, due to the fact that it possesses greater sensitiveness, and can be obtained in a high degree of purity. It can, therefore, be relied upon with regard to uniformity of sensitiveness, a fact which is far from being true in regard to litmus. Furthermore, the correction factor above mentioned can not be accurately determined with litmus due to lack of sensitiveness. Lastly, litmus tends to give results that are decidedly below the correct ones. It is found most convenient to use the indicators in the form of test papers, due to the colored and colloidal nature of the solution. The brom thymol blue paper may be prepared by dissolving one-tenth gram of the substance in 50 c.c. of alcohol, saturating filter paper with this solution and quickly drying. Due to its sensitiveness, this paper is easily affected by strong laboratory fumes, especially ammonia, and on this account should always be kept in a stoppered bottle when not in use.

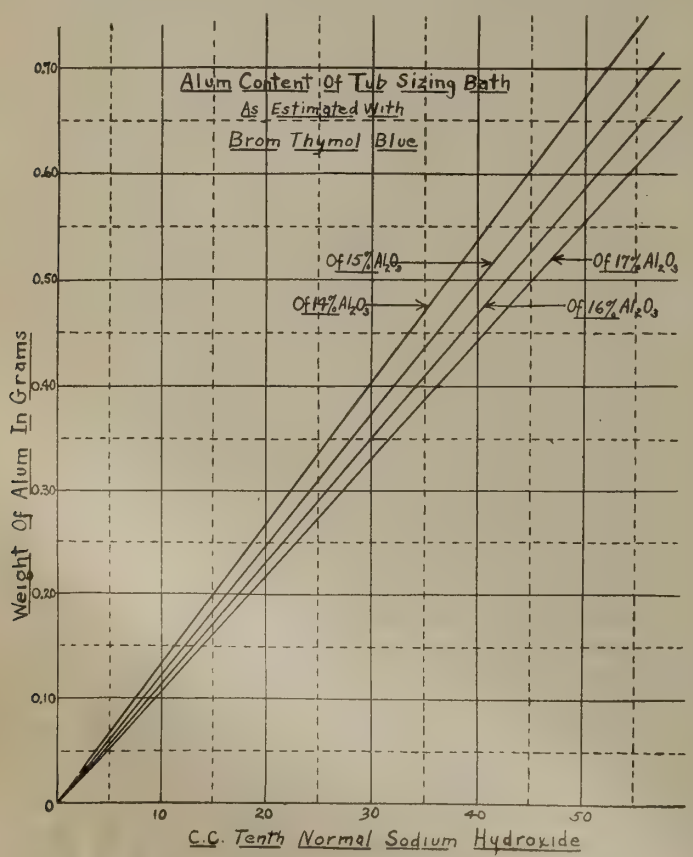
The directions for conducting this test as follows:— A sample of the size is measured out into a small beaker and heated to 130 deg. F. on a water bath. It is tested by immersing a small strip of the yellow brom thymol blue paper in it and withdrawing the same. In case the color of the paper is unaffected, the titration with standard tenth normal sodium hydroxide is commenced. The titration is continued with vigorous stirring of the solution until a fresh strip of the paper is turned to a distinct green; it is finished by continuing until a blue green reaction is obtained. The end point is considerably beyond that at which a green becomes noticeable, and on this account some difficulty, with a tendency toward low results, may be experienced at first. The color at the end point is similar to the color of a solution made by mixing two parts of 10 per cent solutions of copper sulphate and sulphuric acid with one part of a 10 per cent solution of ferric chloride. This color also corresponds to that used for obtaining the correction factor described below. The color changes produced in brom thymol blue paper during the course of this test will alter on standing and partially drying; therefore, it is necessary to make the decision immediately upon withdrawing the paper from the solution. It is essential that a new test strip be used whenever a trial is desired, due to the highly colloidal nature of the solution.

It is possible to use blue litmus paper for this test, although there are several disadvantages in its use as has already been pointed out. If such is preferred, however, the procedure is similar excepting that solutions containing free alum redden the paper and the titration must be carried out until a fresh strip of the paper is no longer affected. The ordinary red litmus paper is useless for this work, because of its lack of sensitiveness. When using the blue paper, the tendency is for the results to be lower than those obtained below; such is especially true at the higher concentrations of alum. If the litmus paper is not of a high degree of sensitiveness, and this is true of many of the commercial grades of paper, the results will be even lower than otherwise. When using this paper, the rapidity with which the paper reddens and the intensity of the color may be used as a gauge of the approach of the end point.

It has been previously pointed out that a correction factor must be applied for the error inherent to an indicator of the range of those under consideration, when used with aluminum sulphate. This has been arrived at as follows. The author has already published a method for estimating aluminum sulphate volumetrically using phenolphthalein (5). A .5000 gm. sample of the alum employed in the present work was found to consume $\frac{N}{10}$ 47.14 c.c. — NaOH by the standard procedure. The same sample consumed 42.86 c.c. $\frac{N}{10}$ — NaOH under the conditions of this test with brom thymol blue. From these figures, we calculate that the reading of our test must be multiplied by 1.100 in order to obtain correct results.

In calculating the result, it is first necessary to correct the reading by adding or substracting the quantity of N/10 NaOH equivalent to the original alkalinity or acidity of the gelatine that is employed. After this the result is multiplied by the correction factor just described. We can then convert the figure to aluminum oxide; 1 c.c. $\frac{N}{10}$ — NaOH = .001703 gm. Al_2O_3. This result is calculated to aluminum sulphate according to the strength of the alum used.

The accompanying chart has been prepared giving the grams of alum of 14 per cent., 15 per cent., 16 per cent and 17 per cent Al_2O_3 content represented by any



reading as obtained. This eliminates all calculations except when it is necessary to correct for the original alkalinity or acidity of the stock.

In order to determine the applicability of this test and to ascertain the degree of accuracy to be expected from it, the following experimental work was carried out. Two samples of distinctly different kinds of commercial gelatine were used, one being originally slightly acid and the other neutral. The solutions were made up by dissolving 50 grams of the gelatine in distilled water and making up to a total weight of 500 grams of solution; in other words, the tests were conducted upon 10 per cent solutions of gelatine. Known quantities of alum, previously dissolved in a minimum of water were added and the resulting mixture analyzed for alum content by the above method. The conditions were so regulated that each sample withdrawn for analysis contained 5 gms. gelatine and the proper amount of alum. The alum used in these experiments analyzed 16.05 per cent Al_2O_3 and showed no free acid as tested with congo red indicator.

SAMPLE A.

Actual Percent of Alum added upon Weight of Gelatine: 2.00; 4.00; 6.00; 8.00; 10.00.

Net c.c. of $\frac{N}{10}$ — NaOH consumed by standard sample: 8.93; 19.15; 26.15; 36.05; 45.20.

c.c. of $\frac{N}{10}$ — NaOH after correcting for indicator error: 9.83; 21.07; 28.75; 39.70; 49.70.

Percent of Al_2O_3 found by analysis, upon wt. of gelatine: .3350; .7190; .9800; 1.353; 1.693.

Percent of Alum found by analysis, upon wt. of gelatine: 2.08; 4.48; 6.10; 8.44; 10.55.

The above sample was originally slightly acid and a sample representing 5 gms. of the gelatine consumed 2.73 c.c. of $\frac{N}{10}$ — NaOH. The figures above are net results after correcting for this factor.

SAMPLE B.

Actual Percent of Alum added upon Weight of Gelatine: 2.00; 4.00; 6.00; 8.00; 10.00.

Net c.c. of $\frac{N}{10}$ — NaOH consumed by standard sample: 8.81; 19.12; 27.58; 36.80; 45.05.

c.c. of $\frac{N}{10}$ — NaOH after correcting for indicator error: 9.70; 21.02; 30.32; 40.50; 49.55.

Percent of Al_2O_3 found by analysis upon wt. of gelatine: .3305; .7170; 1.031; 1.380; 1.689.

Percent of Alum found by analysis upon wt. of gelatine: 2.06; 4.47; 6.44; 8.60; 10.51.

The above sample was originally neutral and therefore no correction was necessary.

It would hardly be wise to conclude this paper without some general remarks upon the theoretical aspects of the test. We find the statement made by Prideaux (6) that colloids tend to alter the equilibrium point of indicators and that glue or gelatine falsifies the results on the average by 0.1 in log (H). That gelatine possesses an iso-electric point, upon one side of which it behaves as an acid, and on the other side of which it behaves as a base, has been pointed out by various investigators (7). It is easily seen from this last statement that only indicators having their color change within a certain narrow range of hydrogen ion concentration would be suitable in the presence of gelatine. When in connection with this, it is realized that aluminum hydroxide is an amphoteric substance, also possessing both acidic and basic properties, it is seen that the working out of this test offered practical difficulties of a serious

nature. Lubs (2) also recommends another indicator, brom cresol purple, to replace litmus; this is shown to have a working range somewhat different than brom thymol blue and proves to be unsuited for our purpose as it turns color much before the true end point is reached. Prideaux (8) states that although it cannot be definitely proved that a test paper will give the same results as the indicator in solution, yet it has been clearly demonstrated that the sensitivity of the papers is sufficient for most purposes. He goes further to say that theoretically the most satisfactory indicators to use in this form would be those with their working range near the neutral line of hydrogen ion concentration, which is the case in this instance.

Summary:—

(1) A method, suitable for mill control, of estimating the excess alum present in tub sizing mixtures has been detailed.

(2) The application of one of the recently synthesized indicators, namely, brom thymol blue, to this work has been investigated. It has been found that the same is eminently suited for the purpose.

(3) It has been pointed out that blue litmus paper may be used for this work, but that the errors involved will be much greater than with brom thymol blue.

(4) The bearing of this test upon the physical properties of the tub sizing solution and of the paper has been noted.

(5) A graphical chart which eliminates the larger part of the calculations has been included.

References:

(1) "A Text Book of Paper Making". C. F. Cross & E. J. Bevan 4th ed. P. 296 (1916).

(2) J. Ind. and Eng. Chem. Vol. 12, No. 3, P. 273, (1920).

(3) F. Sutton "Handbook of Volumetric Analysis", Ed. 9, p. 147 (1904).

(4) May be obtained from Hynson, Wescott & Dunning, Baltimore, Maryland.

(5) Paper, Vol. 26, No. 5, p. 13, (April 7, 1920).

(6) Prideaux, "The Theory and Use of Indicators", p. 210 (1917).

(7) A. M. Field, Jour. Amer. Chem. Soc., 43. No. 3, p. 667 (1921).

(8) Prideaux, loc. cit., pp. 326-327.

CHAMPION FIBRE COMPANY MAKES GENEROUS DONATION TO VOCATIONAL EDUCATION FUND.

The Champion Fibre Company of Canton, North Carolina, has for sometime been taking a very prominent place among the leaders in the Paper Industry, who are affording opportunities for their men to qualify themselves through class work and study to become better workmen and better fitted for promotions to positions of greater responsibility.

At the recent Annual Meeting of the Technical Association of the Pulp and Paper Industry, the representatives of the Champion Fibre Company in attendance had an opportunity to learn in detail of the vocational education work being carried on by T. A. P. P. I., and examined the first two volumes of the series of five textbooks upon pulp and paper manufacture that are being published for wide-spread use throughout North America. When they were told that the vocational Education Committee of the Technical Association still needs a balance of $7,500. to complete the work which has been going on for the past three years, the gentlemen representing the Champion Fibre Company promptly pledged $500 towards the undertaking, the receipt of which the Committee now acknowledges with great appreciation.

Work upon the editing and publishing of the textbooks is going steadily forward and when completed they will afford the best means and industry in North America has yet given the men in it to qualify themselves for better workmanship and the occupation of positions of leadership.

PRACTICAL KINKS

(From La Papetrie).

Question: How can paper be made to have the same strength in machine and cross-direction?

Answer: The best method to obtain as little difference as possible in the strengths is to beat the different pulps separately according to their hardness, so as to obtain the same length of fibre in every case. Then send them to a mixing tank or to a large beater where they need only be given a light brush before sending them to the machine chests. M. L.

Question: In the mill where I work there is no color mixer, the color being added in the machine chests, which contain two beaterfuls. At times insufficient color has been put in, so that more must be added in the machine chests; and as these are not large relatively little water can be used. We make only white and very light colored papers, and the color is nearly always streaky, especially when using violet or Victoria blue. How can this be avoided?

Answer: For white or light-colored papers, I consider that a dilute solution (2 to 4 g. per l. = 1 to 2 oz. in 3 gal. of water) of the color should be made; with such a low concentration any error in the tint may be quickly corrected without any great risk. In the case of Victoria blue or of violet, put the amount of color to be added in half a pail of an emulsion of China clay.

Another method which I have found satisfactory consists in working up the color into a thick paste with acetic acid, 350 part by weight of the color to 100 or 150 parts by volume of acetic acid. Hot water is then added, the mixture is strained, and sufficient water added to give a solution of the desired concentration.

When violet and Victoria blue (which are both basic dyes) are used together, a solution of the two may be prepared. The blue is made into a paste as above described, the paste is dissolved in hot water, and the solution of violet mixed with it. C.H.

Answer: Some colors possess a great affinity for pure vegetable fibres, and hence have a tendency to streak when used with mixed pulps. In such a case, to obtain an even coloring with light shades, first add part of the required amount of alum, then the color solution, then the size, and finally the remainder of the alum. It is advisable to avoid any great excess of alum. A.V.

A.P.-C.

PAPER MANUFACTURE IN AUSTRALIA.

Recent experiments in the making of paper pulp from Australian woods are said to have given most satisfactory results. The test, however, is merely a laboratory one, and there is much reason to doubt the commercial feasibility of such a proposition.

A Practical Study of Corn Cob Utilization

By Dr. Frederick B. LaForge, Organic Chemist, Bur. of Chem., U.S. Dept. of Agric. Chem. Age (New York), **28**, 332-6, (Sept. 1920). Abstracted by A. Papineau-Couture.

Adhesive for Wall Board.

A review of the possibility of using corn cobs for the preparation of paper stock, adhesives, organic solvents, wood flour, artif. silk, etc., with cost and profits of a manufacturing plant. By digestion with water under press. a large amount (30 per cent.) of sol. gums and other carbohydrates can be removed from dried corn stalks. If this treatment is carried out under proper conditions, this material may have great value as an adhesive and as a source of furfural. The removal of as large an amount as possible of these carbohydrates reduces the amount of chemicals necessary for further treatment of the stalks. This is also true in the case of straw and probably in the case of almost all the other plant materials under consideration. A survey of the Corn Belt of the U. S. made with the co-operation of the Bureau of Plant Ind. has shown that certain sections, are capable of providing several mills the year round with 100 t. a day of cobs assembled within a radius of 30 miles at a cost of $4 a ton or less, 100 t. of cobs can be made to pield 45 t. of adhesive "A", 30 t. of adhesive "B", 35 t. of cellulose, 3 t. of $CaAc_2$, and 1.5 t. of furfural. Adhesive "A" may if desired be converted in furfural by heating it with dil. mineral acids, the 45 t. obtainable from 100 t. of cobs yielding about 8 t. Adhesive "A" is a thick, brown solution (about 32°Be) of gums which is obtained by heating dry, field corn cobs with water under press. and concg. the resulting ext. At the end of the heating operation a large part of the liquid has been absorbed by the undissolved residue, which must be subjected to press. to obtain the absorbed portion. The total amount of solution to be evaporated finally to the consistency of the adhesive is about 4.5 times the wt. of the cobs. The distillates contain AcOH which could be recovered at a profit. The cellulosic residue in the form of press-cake is the source of pulp, cellulose flour and adhesive "B". The principal use of adhesive "A" contemplated is as a substitute for the silicate of soda now used in fiber-container and wall-board manufacture. Three machine runs have been made at the plants of container-board manufacturers to test corn-cob adhesive under practical mills conditions as a substitute for silicate. The information obtained from these runs has proved that with slight change in the method of application cob adhesive is suitable for this line of work. Single-faced corrugated board may be pasted with no change in the present working conditions whatsoever. Observation for over a year of the condition of board so pasted and submitted to all common tests have failed to show any unfavourable changes. Pasting double-faced corrugated board on the machine in common use proved rather difficult. The application of heat as in common practice tends to soften the adhesive rather than to set it. Its use in this case seems doubtful without considerable change in equipment. The one run made to test cob adhesive for pasting 4-ply solid fiber board was partly successful, the principal difficulty being that the time required for setting seemed too great under the working conditions. As far as the finished board is concerned, very little difference in strength or water-resistance was observed when it was compared with the stock pasted with silicate. The board has been under observation for nearly a year. Another promising field of usefulness for adhesive "A" is as a substitute for dextrine and other organic gums and glues in the labeling of containers and in the manufacture of coarse envelopes and paper bag. It cannot be used for pasting the finer grades of white stock. For the sizing of walls previous to the application of paper, cob adhesive proved very satisfactory. Corn-cob adhesive has no food value and therefore has the advantage over gums and dextrines in not attracting insects. Adhesive manufactured from sulphite waste liquor are so similar to the material from corn cobs as to be undistinguishable from it except by chemical tests. Their physical properties, such as viscosity, time required for setting, strength, color, etc., are practically identical. Corn-cob adhesive differs chemically from the sulfite-waste adhesive, and on account of its high pentose content may be converted to a large extent into furfural. By treating adhesive "A" with dil. mineral acids, about 25 per cent of furfural, based on the total solids present, may be obtained. This material has some very interesting possibilities as a substitute for formaldehyde in the manufacture of plastics such as bakelite and as a solvent for certain gums and resins, and for cellulose acetate. It also finds application in dyestuffs manufacture. The cellulosic press. cake referred to is ground and subjected to a short treatment at atmospheric press. with 10 parts of boiling 1 per cent NaOH solution to separate the alkali-solution material from the true cellulose. About 40 per cent of the dry wt. of the residue is dissolved to a black liquid, which, after evaporation to the proper consistency, has fairly good adhesive properties. The very deep color of this material would make its use objectionable for most purposes. Its proper field seems to be in the manufacture of briquets and as a core-binder for which purposes it is being tried out. The washing of the black liquor from the cellulosle is best accomplished by a series of 3 continuous filters. After washing the pulp is handled in the same manner as is woodpulp.

Experiments are described which have shown that cob pulp may be employed to a limited extent in several grades of paper, including newsprint. It should not be attempted to employ it in amounts greater than about 30 per cent in any case. If corn-cob cellulose is to be used as a substitute for wood-flour, it must be dried and ground. After this treatment it is very similar to wood flour but possesses a higher absorptive power. A brief description is given of the proposed process and the manufacturing plant, together with estimated costs and profits for a plant treating 100 t. of cobs a day, and for the treating 50 t.

James C. Fraser, woods superintendent here for a number of years for the Spanish River Pulp and Paper Company and a well-known lumberman, died suddenly at Sturgeon Falls, May 1. Mr. Fraser was in his office all day yesterday and did not feel any indisposition. He formerly resided in Massey, Ont., at which place interment will take place. He leaves besides his wife two sons and two daughters.

British Paper Makers' Association Meeting

(Special From Our London Correspondent.)

This year's annual meeting of the British Paper Makers' Association was held in London and the strike of coal miners, and the threatening attitude of other labor interests, compelled a regrettable cutting-down of the program. However, notwithstanding all the threats labor was throwing out, a good many paper makers assembled at the annual meeting and some interesting reports — for the members only — were read and discussed and one or two notable new features adopted.

The President of the Association (Mr. W. L. Tod) was in the chair and as one looked round the gathering only a few old familiar personages in the industry could be identified, the remainder being "new blood" who are stepping in to carry on the work of those able men who sat round the festive board from 8 to 12 years back, many of whom are dead, or retired into private life, or raised to some exalted position in the country's peerage. The gathering, however, was representative of some of the important mills.

Annual Report.

Mr. W. A. Foster, B.A., secretary to the Association, read the annual report. It stated, *inter alia*, "...The organisation of papermakers into sections has been proceeding for some years, and sections are in existence to protect the special interests of makers of newsprint, mechanical-free printings, esparto papers, brown wrappings, grocery papers, caps, M. G. and F. G. papers, fine writing papers and hand-made papers. The Association exerts no authority over the sections, leaving them free to develop on their own lines, but offers them hospitality and clerical assistance, and their work during the year has been of great value. The organisation of the paper trade as a whole has also made an advance during the year, and joint action has been found possible on a number of matters of common interest with the associations representing wholesale stationers and paper merchants, envelope merchants, envelope makers and manufacturing stationers, paper box and bag makers, master printers, wood pulp manufacturers and merchants and waste paper merchants. The value of combined action by the allied trades was specially evident in the case of the revised railway rates classification, where a co-ordinating committee was set up which ensured uniformity of policy on the part of all branches of the industry. The need for a strong manufacturers' association in every industry is well recognised, and as the sphere of Government interference with commerce continues the value of the Association will become more and more evident. Members will also be asked to approve of alterations of the articles of Association, intended for two purposes: to give the sectional organisations a more direct influence over the main body, and to bring the representatives of the districts into constant communication with each other. An industry whose mills are scattered over the Kingdom is apt to group its sympathies according to geographical accident rather than by community of interest, and the main reason of the revision of rules is to overcome this difficulty.

The avenues along which progress towards constructive work has been attempted are so numerous that it is difficult even to summarise them within the brief limits of this report. The revision of the wood pulp contract note and the revision of the codified trade customs are two great questions which have absorbed much time and energy without the achievement of a completed result, but as the co-operation of the respective allied Association has been obtained, there is good reason to hope for ultimate success. The maintenance of net terms of payment, the question of charging ordered weight or scale weight, and the possibility of stabilization of the market, have been subjects of discussion with the National Association of Wholesale Stationers. Methods of packing paper for transit by rail, the appropriate charges for transport of exports grass, and the many questions involved in the proposals for revision of the railway classification, have been discussed with the Railway Managers' Committee. The Association has been in close touch with the Board of Trade both on matters of urgency such as the coal strike, and on more permanent questions such as the regulation of imports and exports, the rectification of depreciated exchanges, and the protection of key industries...Members may rest assured that a continual watch is kept, day by day, on matters affecting the industry, and that the appropriate Government Department is immediately advised of the bearings of any proposal or possibility upon the papermaking industry."

Rectifying the Government Mistakes.

The report proceeds to deal with a subject that has been more than once aired in the "Pulp and Paper Magazine" and that is the Board of Trade's system in dealing with paper imports and exports. Mr. Foster says: "The Association has, at various times, been called upon to obtain statistics at short notice, and has been handicapped by the absence of permanent records of the state of the industry, and by the imperfect system of classification of imports and exports of paper adopted by the Board of Trade. This classification was revised at the beginning of the year and the Association now obtains from H. M. Customs each month a full analysis of the figures, giving the countries of origin and destination of all classes of paper imported and exported. A summary of the analysed figures is circulated to members and the full details are tabulated in the office so as to be readily available for future use.

A completely new departure in the Association's policy was marked by the unanimous decision of the last annual general meeting to establish a Technical Section, and the progress made is fully reported in the first volume of its published proceedings, which were available on the day of the second general conference of the section, April 13th. The work of the Technical Section during the year has covered a wide area. In addition to the general conferences, at which elaborate papers were read and discussed, local conferences of a less formal nature have been held by the Aberdeen London and Manchester local branches. The revival of papermaking classes in centres where they had been discontinued and their formation in new centres has been brought about; the section has also been successful in securing the continuation of the City and Guilds First Grade Examination in Papermaking Technology, which the Board of Education had proposed to abandon. The syllabus for this examination and for the final grade has been revised and amended on the recommendation of the Section Committee. The Section is in touch with the kindred institution in the U. S. A. and an interchange of publications is to be arranged. Conservations have also taken place with the Department of Scientific and Industrial Research and with the Department of Overseas Trade with reference to the use of

various fibres for papermaking... The Association has to record its gratitude to Mr. Lewis Evans, J.P., F.S.A., the retiring president, for the gift of his library of books connected with the history of papermaking. This should be the nucleus of a technical library for the use of the industry and additional contributions have already been received from Mr. W. W. de Buriatte and Mr. H. Bradly. Mr. Wm. Raitt (India) has also given to the Association a set of curios and photographs illustrating the manufacture of paper in Kashmir. Members are asked to aid in the formation of an adequate library and museum. The historical side of the industry has not so far met with the treatment it deserves. The series of papermaking directions in our possession, for example, is far from being complete. Though it begins with 1853 the next copies available are 1862 and 1877, and the gaps certainly should be filled.

The last annual general meeting also appointed a special committee to formulate a scheme for encouraging and increasing export trade, and, along with a committee appointed by the National Association of Wholesale Stationers, this committee has made considerable exploration of the ground. There have, of course, been unforseen and unfortunate developments with regard to export trade, especially with India and Australia, but when the abnormal conditions come to an end, there may be possibilities in this direction upon which you will receive a report..."

The report covers all the year's work of the Asso- and first obtain the co-operation of the practical paper- by the Association. On the resolution of the President, seconded by Mr. A. Baker, the report was adopted.

Election of Officers.

Mr. Tod, who has well over 40 years experience in the paper mill, was re-elected to the Presidency. His past year in office has been a difficult one owing to the many ups and down the industry has had to face and he has piloted the Association through all the trouble with great tact.

Mr. H. Green was also re-elected Treasurer and Mr. P. H. Williams auditor.

The Technical Section.

Mr. A. Baker, the chairman of the Technical Section, presented his first year's report. It stated, *Inter alia,* "...The constitution has been carefully drawn and will, we believe, enable us to lay the foundation for the future upon a very broad base. The membership includes: 1 honorary member, 158 members, 41 associate members, 20 juniors members; total 220...As the President of the Association realised at our first meeting in Manchester, we have tapped a new source, mainly of younger men, who will take a keen interest in the work connected with the trade...It is our policy to go slowly, and first obtain the co-operation of the practical papermaker, engineer and chemist on matters of general interest — the rest will follow. There are sure signs that our efforts are meeting with success. I would, however, like to emphasize one point. My committee has devoted a large amount of time to the consideration of educational matters and we feel it is desirable that employers should take more than a passing interest in the education and training of their employees, especially those who will become the skilled workers of the future. There is a distinct need for some form of very elementary instruction in paper manufacture suitable for the average worker who enters the industry. We hope to do something towards meeting this deficiency during the coming year. Apart from the meetings of the members, the efforts of my committee have been largely of the nature of spade work and on that account it has been very gratifying to receive appreciation from unexpected quarters.

In one respect we have been disappointed. Only 26 firms have become members of the Section, which means that the Association as a body is not putting its weight behind the movement. Experience always shows that in new endeavors one finds less practical discouragement in the opposition of some people than in the inertia of others. That indifference should be shown by manufacturers is unfortunate, because we find many workers who would otherwise associate themselves with the Section, hesitate to do so because they fear their employers would not approve. It is well to remember that the application of advances in mechanical, electrical and chemical science to industry, and the evolution of any considerable development in manufacturing practice, is rarely the work of one mind, but invariably due to the alternate action of invention, design and discovery by the labors of successive or simultaneous workers. If the technique and economy of our industry can be improved by the pooling of knowledge and the interchange of ideas — and if the intelligent interest of the worker can be awakened and maintained in his daily task, then we, as employers, will surely receive some benefit as a reflex of that action."

The value of the Technical Section was eulagised by several members of the Association and it was mentioned that the subject of engineering was an important element in papermaking for inclusion in the syllabus prepared by the London City and Guilds Institute. Heretofore attention was concentrated on chemistry which was not sufficient. Evening schools were also advocated as a successful medium for helping the workers in mills. They were being tried and proved very beneficial.

The report was adopted and it was also agreed to draw the attention of all paper manufacturers to the importance of the Technical Section.

Export Trade.

Memorandums and articles of Association had been drawn up for the Export Association. This new body will deal with special points for the paper exporter and be a sort of information bureau. It is one of the Association's new adjuncts and Mr. T. Parker Smith and Mr. W. W. Birrell are getting it into order so as to make it useful for exporters.

Publicity versus Imported Paper.

Mr. Stanley Cousins moved: "That this Association, while recognising the good work done by the Secretary in his negotiations with the Board of Trade and Federation of British Industries, resolves to form a Publicity Committee to keep before the public and their Members of Parliament the critical position of the papermaking industry in this country, which is due largely to the depreciated value of continental currency, enabling imported paper to be offered at far below the cost of British mills, causing unemployment to an extent heretofore unknown." The resolution was passed and a small committee appointed to watch things.

The foregoing resolution shows the falling of the Association particularly when Scandinavian and German wrapping papers find a good outlet at present. On the newsprint side Lord Beaverbrook and Sir Edward Hulton, who recently replied to Mr. Stanley Cousin's appeal to include paper in the Anti-Dumping Bill, have again returned to the fray and after the meeting of the Association they wrote a letter calling attention to the "danger with which the consumers of newsprint in this country are threatened by the provisions of the Anti-

Dumping Bill." They said: "Today, the newsprint manufacturers are putting their product on the market at 4d (8 cents) a pound. The world price is 2⅞d a pound...The trouble in the newsprint industry is due to an attempt to keep up an inflated price at any cost—even of a tariff for which the consumer must pay."

Several newspapers are bolstering up attacks on the newsprint manufacturers and the pulp makers. It is to enlighten these gentlemen the Paper makers' Association has started the Publicity Committee and the sooner that body sets to work the better. One consumer writes that 6 cents a pound for newsprint is killing newspapers. "If the paper mills," he adds, "want the business they should set to work to arrange their paper-pulp contracts so as to be able to supply paper at that price. If pulp makers are stupid enough to continue their profiteering, they will not only kill the newsprint manufacturer, but the newspaper proprietor as well... newsprint users look with anxiety to the protection sought for newsprint manufacturers, which would leave the price of paper in the hands of the British paper ring. The experience of the paper control should not again be tolerated..."

CANADIAN PRESS LTD. MET.

The conspicuous improvement in news service during the past year was dealt with by President E. Norman Smith of the Canadian Press, Ltd., at the annual meeting in Toronto last week. Particular attention was directed to the value to the people of Canada as a whole of the impartial and accurate reports being sent from Ottawa covering Parliament and Government news. In referring to the close relations existing between the Associated Press and the Canadian Press, Mr. Smith said that the publishers and Editors of Canada have for many years had an abiding faith in the all-round merits of the Associated Press, and were proud of their alliance with that great organization in the United States.

The management presented a report on the present cable service, showing that the very limited funds now available were insufficient to cover more than a very meagre service of news, chiefly sport, from London, and asking that this assessment be increased to permit of more scope in the direct cable service. This recommendation was adopted by the shareholders.

A number of routine reports were received and adopted, including that of the auditors, and estimates for the next financial year were adopted.

Directors for the coming year were elected as follows:

Maritime division — G. Fred. Pearson, Halifax Chronicle; F. B. Ellis, St. John Globe.

Ontario and Quebec division — H. Gagnon, Quebec City Le Soleil; C. F. Crandall, Montreal Star; John Scott, Montreal Gazette; E. Norman Smith, Ottawa Journal; W. J. Wilkinson, Toronto Mail and Empire; W. J. McNair, Hamilton Herald; T. H. Preston, Brantford Expositor; A. R. Ford, London Free Press.

Western division — E. H. Macklin, Manitoba Free Press; R. L. Richardson, Winnipeg Tribune; Burford Hooke, Regina Leader; J. H. Woods, Calgary Herald, and F. J. Burd, Vancouver Province.

At a subsequent meeting of the Board of Directors, the following officers were elected for the coming year: President, E. Norman Smith; First Vice-President, E. H. Macklin; Second Vice-President, G. Fred. Pearson; General Manager and Secretary, J. F. B. Livesay.

MONEY TALKS.

On The Position of Canada's Pulp and Paper Industry.

The following tribute to the industry is quoted from a bulletin of the Royal Securities Corporation. In 1919 we published an announcement entitled "Why We are Backing Pulp and Paper Securities." In it we said:—

"But one thought is in the mind of Canadian big business to-day — EXPORT.

"And it is chiefly because Canada's pulp and paper industry has proved its ability to get and hold EXPORT business that we believe in this industry and are backing our belief with our resources.

"In 1890, Canada's exports of pulp and paper totalled $120. By 1912, they had grown to $14,600,000. By 1917 they had nearly quadrupled to $52,000,000. For fiscal year 1918-1919 they ran close to $100,000,000, nearly double what they were two years before."

The export figures for fiscal year ended March, 1920, were $113,091,704. For fiscal year ended March, 1921, they will come pretty close to $160,000,000—thus amply making good our forecast.

In spite of world readjustment conditions which cannot but temporarily affect the Canadian pulp and paper industry, as it has affected every other world industry, we once more put on record our confidence in the continued expansion, the fundamental soundness, and the national importance to Canada of her pulp, paper and lumber industry.

Growth Consistent and Permanent.

Its expansion is not due to temporary inflation. It is not the result of war conditions. It dates back to pre-war years and is consistent and steady.

It is a growth based upon the most solid of all foundations—world demand for a staple product, which, due to other countries' increasing lack of cheap raw materials, Canada can supply in largest quantity and at lowest cost.

The fact is, that no other country has such enormous resources of cheap pulpwood in close proximity to such abundant water powers, as has Canada. She can therefore compete with the world in low cost production—and in pulp and paper, as in everything else, the world buys in the cheapest market.

So it is that the pulp, paper and lumber industry has come to be the most important of Canada's manufacturing export industries.

Markets Assured.

Foreign competition is to be expected; but Canada has no reason to fear it. With her low-cost power and wood, and the increased efficiency of personnel and plant, Canada can, **and will,** more than hold her own against all competitors.

At her very door, within easy rail-haul, lies the greatest pulp, paper and lumber consuming country in the world.

United States forests have already reached a degree of depletion that makes paper manufacturing costs very high. Production in the United States has already passed the maximum of its possibilities. Since 1909 newsprint consumption in the United States has increased 100 per cent; production has increased only 30 per cent. In 1920, the United States produced only 70 per cent of the newsprint it consumed; 95 per cent of the amount imported came from Canada. The United States imports from Canada two-thirds of the pulpwood it consumes.

As the years go by, not only the United States, but other countries as well, must have Canadian pulp and paper in increasing quantities.

True, there has been a temporary slackening of demand for some pulp, paper and lumber products, due to general trade conditions, but already there is a stiffening of demand and an increase in mill orders.

World industry is not going to collapse. As long as business is carried on, this and other continents must have Canadian pulp and paper.

Therefore, pulp, paper and lumber production in Canada is still in its infancy.

Bulkwark of Canadian Credit.

The pulp and paper industry has never had or needed tariff protection. Unlike some other Canadian industries its prosperity is in no way dependent on tariff provisions.

Into the American market its products are drawn irresistibly by the magnet of a high exchange premium, resulting in additional profit to the Canadian pulp and paper companies and operating more than other factors to pay Canada's adverse trade balance with the United States.

Many Canadian exports, wheat for example, cannot be readily sold abroad because of the depreciation of European currencies in terms of the Canadian dollar.

But both demand and exchange combine to cause a steady stream of Canadian pulp and paper products into the world's best market, to be paid for in American dollars, the least depreciated of the world's currencies.

Canada's pulp and paper industry is proving one of her most valuable assets at a time when Canadian credit must be maintained at its highest.

Attractive to Investment Capital.

True, prices for pulp and paper products may go lower, but they can go far and still leave a satisfactory margin of profit, provided by increased production efficiency and reduced production costs.

It is true also that the speculative era in pulp and paper shares is over for the time being, and that not a few speculators have been taught a salutary lesson.

But the Canadian pulp and paper industry is not run for speculation. It is too great—and too necessary to national welfare.

It is the result of this self-same magnitude and national importance, as well as of the fundamental security offered by mortgages on vast areas of pulpwood and enormous resources of water powers, that is attracting a flow of both American and Canadian investment capital into new issues of Canadian pulp, paper and lumber securities.

Why New Financing?

The financial necessities of the Canadian pulp and paper industry have always been, and always will be, provided for by the Banks and Investment Bankers responsible for financing the industry. It is quite as much of a national necessity to finance the export to the United States of our yearly output of pulp, paper and lumber as it is to finance the export of our wheat crop.

The reasons for current financing by some of the larger pulp and paper companies are sound and may be stated quite simply. During the past few years the larger Canadian companies have expended many millions, for the most part out of earnings, to increase plant capacity and to add to supplies of pulpwood and power. This increased capacity, now coming into effect requires larger working capital. Also, pulpwood of which some companies use as much as 500,000 cords per annum has risen in cost from $6 to $12 per cord, necessitating largely increased working capital. Is it, then, a matter of wonder that some of the larger Canadian companies are now borrowing to the extent of one-half to two-thirds of cost of plant extensions, thereby replacing working capital expended? That most of the Canadian pulp and paper companies have been able to make their extensions out of earnings, with as little borrowing as has taken place, is in reality a tribute to their earning power, and is one of the soundest reasons we know for the fundamental strength of the industry.

Every world industry is financing at this time; but very few indeed have the assets and earnings on which to borrow that are shown by the strong Canadian pulp and paper companies.

PULP AND PAPER IN MEXICO.

Owing to the circumstance that Mexico's large paper mills—"San Rafael"—were not in a position to manufacture their own chemically prepared woodpulp, large shipments were recently imported from the United States and some 160 tons, valued at over $13,000, from Canada. Before the war, Mexico imported nearly all the woodpulp she required from Germany, Sweden and Russia, to the value of about $500,000 annually. Recently, however, owing to the high prices of American and Canadian pulp, it has paid to manufacture woodpulp in Mexico, and plants which were shut down for periods during the revolution are now running full time. It is not likely, now that the two or three large paper plants in Mexico have their own pulp mills, that any appreciable quantities of either sulphite or mechanical will be required from outside.

One of the few items of American trade with Mexico which shows a falling off in 1920, as compared with 1919, is that of paper—$205,546 for the first ten months of 1920 as compared with $385,453 for the corresponding period of 1919. This may be explained by the reopening in 1919 of the San Rafael paper mills which had been closed down for two or three years because the Zapatista bandits liked the comforts surrounding these plants and appropriated them for themselves. San Rafael makes most of the newsprint required in Mexico which is probably not more than 100 tons a day—in fact, this mill is now exporting newsprint to the United States. Wrapping papers and cardboards are also made by San Rafael—sufficient to supply the whole of central Mexico. Finer papers are imported, however, and many coast districts import their paper supplies from abroad. Before the war, Mexico bought more paper from Europe than from the United States, and the writer recently noticed several stationery stores in Mexico featuring German paper products, although most of the paper products entering the country since 1914 have come from the United States.

Wallpaper is used extensively in central Mexico. Only the best and most up-to-date patterns will find a market, because wallpaper is bought solely by the well-to-do. In 1912 Canada exported nearly $12,000 worth of wallpaper to Mexico; in 1913, $4,239, and in 1920 only $1,713. During the fiscal year 1920, however, other papers, excluding newsprint, were exported from Canada to Mexico to the value of $10,768.—Trade and Commerce Bulletin.

FOREST CONSERVATION AND PERPETUATION.

We are told by competent authorities that the destruction of the spruce forests of the United States, east of the Rockies, is nearing completion. Fifteen years more at the present rate of consumption will see the end of their standing spruce and balsam, says Mr. R. O. Sweezey in a special article to the Montreal Gazette.

This is most serious, because spruce and balsam are the only really suitable woods for the manufacture of newsprint paper and sulphite pulp. Pine, of which there is a fair young crop growing up again by natural restoration, both in the United States and Canada, is suitable as a pulp only in the manufacture of kraft papers.

If such is the condition in the United States' forests, what about the forests of Canada? At the present rate of spruce and balsam consumption for pulp paper and lumber in Canada, plus the fire and insect damages and increasing demands, our forests can last about fifty years.

From a negligible production in 1900, the pulp paper and pulpwood consumption and exports of Canada have risen to the equivalent of over three million cords (spruce and balsam). Add to this the equivalent of four million cords (spruce and balsam) that goes into lumber, plus fire and other losses, and we find (bearing in mind also the increasing demand) that a consumption of ten million cords per year is in sight. Now our forest capital of available spruce and balsam in Canada scarcely exceeds five hundred million cords. In the past we have lost more by fire than we have cut. Over 75 per cent of the present forest area of Canada has been burnt over at least once in the past two hundred years. We know what has happened in the United States, and we know that when the destruction has been completed there a further heavy tax must fall on Canadian forests; we also know that the world consumption of paper is increasing every year. We know a lot of things, but democratic like, what is everybody's business we regard as nobody's business.

Hence, forest conservation and scientific forestry are merely expressions that call forth the cynical repartee of the so-called practical logger, a symptom equalled only by the evasiveness of the responsible managements who, having started a toy nursery near their mills, imagine that they have solved the problems of the forest once and for all.

The first necessity in forest conservation is obviously protection from fire, and for this — thanks to the untiring energy and dogged persistence of Ellwood Wilson, of the Laurentide Company, — Quebec Province at least is now organized for fire prevention and fire-fighting to the point of having thus far saved the country scores of millions of dollars that would otherwise have gone up in smoke.

The other provinces, except New Brunswick, are far behind in this respect, though their apathy is as naught beside the criminal destruction that the Canadian Government Railways are every summer responsible for. Private railroads come under the forest protective rules of the Railways Commission, and no fires are set along their lines. Government Railways, however, are a law unto themselves, privileged to burn down the national heritage, and now that the Grand Trunk and Canadian Northern are added to this management, we may expect fire losses to keep pace with operating losses, if they do not exceed them.

What Quebec Province is doing for fire protection, the rest of the country can do. What Europe has, all too late, awakened to do in scientific forestry, we can start before it is too late. True, our problems differ in many respects, but they can be solved. We must stop eating up the principal and live upon the interest, or increment, of the forest.

Trees grow by accretion, the larger the tree the greater the volume of growth in a year, up to the point of maturity. Instead of cutting an area clean, we must spread our operations over larger areas, select only full-grown or nearly full-grown trees, leaving the younger to grow up to be in turn cut at or near maturity. A combination of natural and artificial reforestation is necessary to develop the maximum production on a given area. This is known as scientific forestry. That we can expect a great deal of help from natural restoration is obvious from the fact that all our present forests have grown from nature. At present we select the spruce and balsam and pine for cutting, leaving the hardwoods to gain supremacy, and eventually choke out the soft woods as in the Eastern States. This is only one, but a serious one, of the problems confronting us.

The solution of these forest problems is necessarily costly. Hitherto the lumber and paper industries made insufficient profits to enable them to cope with the difficulties, but the amalgamating of interests and recent enormous growth of several of the leading pulp and paper companies should enable them to attack the question of forest conservation and perpetuation with every confidence of success.

In this country it should be possible to obtain an annual increment of three per cent on our estimated capital of five hundred million cords. This could supply all the paper requirements of the world.

The attainment of such an ideal can hardly be expected, nor can even a fair part thereof be realized short of many years of grinding and struggling against the fanatical jeers of the so-called practical logger, no less than against the ill-advised application of theories from the utterly unpractical mind.

We are not yet practising scientific forestry in any of the present large logging operations in Canada. The Quebec Government authorities are endeavoring to formulate laws for the purpose, and so are the New Brunswick authorities, but their efforts, though laudable, show an insufficient grasp of the practical details.

That there are proper solutions to the difficulties cannot be denied. It is largely a question of dollars and cents, with the argument for immediate profit outweighing for the moment all arguments for the long-term profit.

Columbia University, New York, has arranged a course on pulp and paper manufacture to be given at the coming Summer session. Leading experts in the industry have been secured as instructors, among them Hugh P. Baker, Secretary of the American Paper and Pulp Association; Fred. C. Clark, Director of the Department of Technical Control, American Writing Paper Company, Sigmund Wang, Chief Chemist of the Riordon Company, Ltd., and others equally prominent.

Our prayer should not be for a different kind of work, but for strength to do well that which is confided to us.

Abitibi Company Pioneers of Ontario's Northland

By A. R. R. JONES.

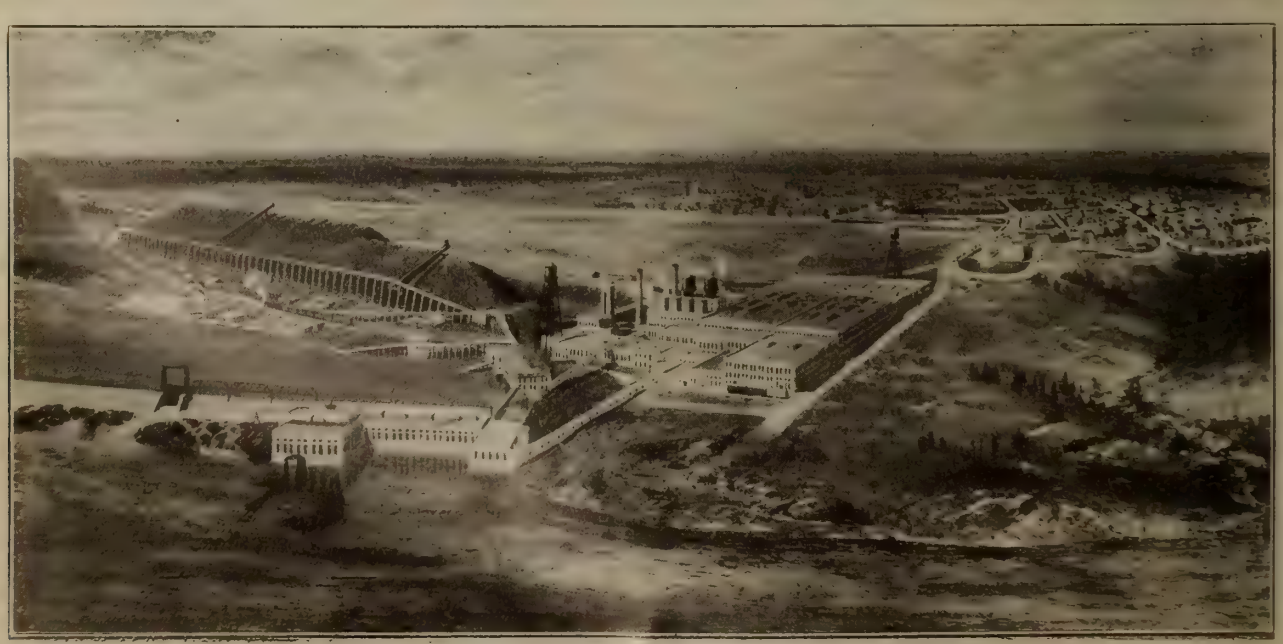
The story of the organization of the Abitibi Power and Paper Company, Ltd., is one far removed from the common run of the stories of the founding of successful business enterprises. It is no humdrum tale of just erecting a plant in a suitable location and then sitting back to watch the wheels go round. It is a story rather to grip the imagination of all red-blooded men. Canada is a land which is full of the triumphant achievements of man in harnessing to his uses the silent and solitary wastes of Nature. But even in such a land, the accomplishment of those responsible for the guidance of the destinies of the Abitibi Power and Paper Company must be reckoned an eminently notable one.

Today, Iroquois Falls, where the Company's fine plant stands, is a thriving, bustling town where the wheels of commerce turn apace—a veritable hive of human industry—a town well planned and well laid out, where municipal government is good and where civic patriotism is strong. Eight years ago, it was scarcely on the map. It was seven miles from a railway station. The land was, for the most part, virgin forest known to few and those few only surveyors or prospectors. To organize in such a location an enterprise which has become one of the largest individual pulp and paper plants in the world was a Herculean task. Its completely successful accomplishment speaks volumes for the men who took that task in hand. They must have been—in fact, they were—men of large vision, of boundless energy and enthusiasm for their project, and, above all, men of courage that neither flagged nor failed.

As just an instance of the many difficulties that had to be surmounted—difficulties which might well have daunted any men of force, less steadfast or of fibre less staunch than those who have made the name and fame of Abitibi—it may be observed that, at the time when building operations were decided on, all building material, except the lumber, had to be towed on barges by gasoline launches from Matheson, on the Temiskaming and Northern Ontario Railway, down the Black and Abitibi rivers to the mill site. The mill itself begun in the spring of the year 1913, and was well advanced when the first train over the new spur from the Temiskaming and Northern Ontario Railway ran in with steel in September of the same year.

Of course, the towing of building material down rivers filled with snags and deadhead was not the only—perhaps it was not even the most formidable, although certainly not the least obvious—obstacle that had to be surmounted. There was the difficulty of interesting capital. Then, again, the mill site, as has been indicated above, was in the unpeopled wilds. This, of course, meant that there was on accommodation. Nor were there any near-at-hand sources of supply. In a word, there was nothing but pulpwood all around. The men had to be housed and fed. Their social and intellectual and spiritual needs had to be ministered to. Hence, the land around the mill site had to be cleared, houses built and equipped, water and electric light systems installed, and the usual concomitants of civilized life—churches, recreation rooms, stores, dairies, laundries and so forth—to be established. With regard to some of these a word or two will be said later. For the moment, suffice it to say, with respect to the early construction of the plant that, started in the spring of 1913, a good portion of the groundwood mill was completed in the following winter, and in August, 1914, the first shipment of pulp was made. Then the sulphite and paper mills were pushed ahead, and in July, 1915, paper was shipped.

It was from such beginnings that the plant has grown to its present enormous capacity. With its new equipment, already installed, it will rank as one of the largest newsprint mills in the world, with a capacity of 150,000 tons of finished paper per year, and a total capacity in saleable products, including excess groundwood and sulphite, of well over 220,000 tons per year. This total is made up as follows: finished paper, 150,000 tons; groundwood 50,000 tons; and sulphite pulp, 20,-



A view of the mill and town site as seen from the air.

000 tons. With reference to this large output, it should be added that all the finished paper that the Company is capable of producing this year has already been sold, and a large part of its product for a period of five years has been contracted for.

The mills are of steel and concrete fireproof construction throughout. They are equipped with the most modern and efficient machinery known, and are capable of continuous operation at high capacity with a minimum of maintenance and depreciation. As regards equipment, it should be mentioned that the new equipment includes two new Walmsley machines 232 inches wide—the biggest paper machines ever made—and a new Pusey & Jones 160 inch machine. All three machines are already installed, the Pusey & Jones machine is ready to run right now, and the Walmsley machines will be ready to run next month. Special precaution has been taken for the elimination of fire risk by the use of steel and concrete in all structure, and by the installation of a complete sprinkler system in all buildings, an efficient hydrant service in yards, high gravity water pressure, and ample fire pump



The fine new Iroquois Falls school house.

capacity. The employees at the plant number 900 some at present but with the producing capacity to be doubled up by the machines mentioned above, about 1,300 persons will be employed in three months' time. Mr. R. A. McInnis is the mill manager.

The Company is in a wonderfully fortunate position as to its pulpwood supply as its pulpwood limits cover an area of over one million acres, which is held on lease from the Government of the Province of Ontario. The location of these limits is adjacent to the mill at Iroquois Falls being situated along the Upper and Lower Abitibi Lakes and along the Abitibi and tributary rivers. The limits are estimated to contain over five million cords of spruce and other woods suitable for pulp and paper-making. In addition to this the timber tracts lying to the north of the Abitibi Limits contain in the neighborhood of fifteen million cords of wood suitable for paper-making. The Company is pursuing a general policy of encouraging surrounding settlers to cut the timber off their lots and sell it to the company. This colonization policy should be of material advantage to Northern Ontario in the opening up of this sparsely populated country. The woods department is under the control of Mr. A. W. Hennessy with headquarters at Iroquois Falls Ont. This organization is responsible for the cutting of the logs in the bush and the delivering of them at the jackladders of the mills at Iroquois Falls. About 2,500 men are employed in forestry operations in the wintertime.

The power development of the Company is primarily held on lease from the Government of the Province of Ontario, running for a period of fifty-two years. The watershed of the Abtibi River above Iroquois Falls comprises an area of 6,000 square miles, of which a large part is the water surfaces of lakes and rivers. The Upper and Lower Lakes Abitibi with an area of three hundred and fifty-five square miles, form an enormous storage pond immediately behind the company's power sites. The output of this huge storage is controlled by a storage ram, with eight discharge gates at Couchiching Falls, the natural outlet of the lakes. This insures a practically uniform discharge for the operation of the paper mills, and the enormous storage eliminates the possibility of any shortage of water. The three power sites at Iroquois, Twin and Couchiching Falls aggregate a total development of 50,000 h.p. of which that at Iroquois Falls, approximating 23,000 horse power, is completed and in daily operation, while that of Twin and Couchiching Falls is only partly developed. At Iroquois Falls the development consists of fourteen 2,000 H.P. Holyoke turbines, operating under a head of 42 ft., ten of which are directly connected to pulpwood grinders. The other four operate four Westinghouse 1,250 K.V.A. generators which supply the power for the mills and lighting for the town of Iroquois Falls. The waste water at this point is handled by means of a 40′ x 24′ "Stoney Sluice" built by the Dominion Bridge Co., Ltd., of Montreal, Que.

The Company leaves nothing undone which is calculated to add to the comfort and convenience of those who serve it. It has built a departmental store where goods can be purchased at little more than cost. It has erected the finest hotel in the North Country, with large reading, writing, dining, reception and card rooms, and with sleeping accommodation for two hundred people. At this hotel, which is under the management of Mr. R. Graves, formerly manager of the Place Viger Hotel, Montreal, more than a thousand meals a day are served, on an average.



Mr. F. H. Anson, President.

There are three churches which the people themselves have built. One of these is for Roman Catholics, another for those belonging to the Church of England, and the other for the united Presbyterians and Methodists. The townsite contains approximately 200 houses of the detached and semi-detached type, varying in size from the four-roomed bungalow to the eight-roomed house. They are built with considerable taste and nearly every house has its own verandah, with a spacious garden both front and back. Macadam roads are laid down throughout the town with concrete curbing and wooden side-walks. The sewers are also laid throughout the town, and a complete water system is provided from the pumping station at the mill. A bank, a hospital, a fire brigade and a police force have been added to the conveniences of the community. The Company owns and publishes a brightly-written newspaper. There is an excellent school, employing seven teachers. In short, the activities of the Company have resulted in making of Iroquois Falls a thoroughly attractive town, possessing all modern conveniences.

Mention should be made of the successful endeavors that the Company is making to stimulate among its employees a genuine interest in their work. In this connection, very valuable work is being done by means of vocational educational lectures delivered by the Company's experts. Then there is the scientific Forestry department, which has established a nursery from which to reforest cut-over areas, and is examining many other woods besides spruce and balsam in regard to their fitness for the North Country and their use in the industry. The Service division, again, in addition to the usual efficiency and statistical work, undertakes very valuable research work in a completely equipped laboratory. The Employment department, in addition to engaging all the employees, does a tremendous lot, in the way of adjustment of grievances, to make the wheels run smoothly.

Perhaps enough has been said here to give some idea of the sort of concern that the Abitibi Power & Paper Company is—of its up-to-date plant, its favored position as regards both supply and output, its enterprise, its energy, its warm human sympathy with all that tends to the welfare and well-being of all connected with it. Mr. F. H. Anson is the president of the Company, and has held that office since its inception. Messrs. Shirley Ogilvie and Alexander Smith are its vice-presidents; and the other directors are Messrs. W. A. Black, George E. Challes, W. K. George, G. H. Kilmer, K. C., Victor E. Mitchell, K.C., D.C.L., and Sir Thomas Tait, Mr. W. H. Smith is the treasurer, and Mr. L. R. Wilson the secretary of the Company.



Mr. L. R. Wilson, Secretary.

A BEAUTIFUL REPORT.

A Government official's report is seldom a work of art but such a statement in no way applies to the report for 1919 by Forrest H. Colby, Forrest Commissioner for the State of Maine. We have never seen and we doubt if there has been produced, at least on this continent, a report that could compare in the beauty of its execution both in print and illustrations, with this one. It is printed on coated stock in a brown ink which gives a most attractive appearance. The illustrations are not only beautiful in themselves but each one carries its own tale, including of course, the pictures of the pigs and porcupines. The book contains 163 pages with a picture on almost every other page and covers not only in detail but in an interesting manner, the activities with regard to forest protection and conservation in Maine. Credit should be given to the Journal Printing Shop and Bindery of Lewistown, Me., as well as to Mr. Colby's department for the appearance of this work.

Books for Papermakers Library

Compilation by Secretary Keenan of TAPPI.

Numerous inquiries regarding desirable books for the papermakers' library have reached us from different sources. In reply the following list is suggsted. When the text books upon papermaking now in preparation by he Joint Vocational Education Committee of the Technical Associations of the United States and Canada are published they should be added. Any of these books may be ordered from the Pulp and Paper Magazine with remittance in U.S. funds.

Art of Papermaking, The—By Alexander Watt. (D. Van Nostrand Co., $5.00).

Dyeing of Paper Pulp, The—By Julius Erfurt, English Edition by Julius Hubner. Published by Scott, Greenwood & Son, 8 Broadway, Ludgate Hill, London, E.C. and sold in the United States by D. Van Nostrand Co., New York. ($5.00).

History of Paper Manufacturing in the United States—By Lyman Horace Weeks. An account of the origin and development of paper manufacture in the United States from 1690 to 1916. Contains illustrations of principal mills and numerous portraits of leaders in the industry. Published by Lockwood Trade Journal Company, 10 East 39th Street, New York. ($7.00).

Lockwood's Directory of the Paper and Allied Trades—Published by Lockwood Trade Journal Company, New York, 1921. ($7.00).

Modern Pulp and Paper Making—By G. S. Witham, Sr. This is a practical American treatise which gives particulars of every phase of papermaking from the saw mill to the finishing room. Published by the Chemical Catalog Company, 170 Metropolitan Tower, New York. ($6.00).

Paper—By H. A. Maddox. This is a popular treatise. (Isaac Pitman & Company, New York. 75 cents).

Paper and its Uses—By E. A. Dawe. Second Edition. Published by Crosby, Lockwood & Sons, 7 Stationers' Hall Court London, E.C. (New York, D. Appleton & Co. $4.00).

Paper Mill Chemist, The—By Henry P. Stevens. Second Edition, 1919. (D. Van Nostrand Co., $4.00).

Paper Technology—An elementary manual. By R. W. Sindall (D. Van Nostrand Co., 8 Warren Street, New York. $4.00).

Practical Papermaking—By Geo. Clapperton. (D. Van Nostrand Co., $5.00).

Chemistry of Papermaking—By Griffin and Little. This book has been out of print for some time. A photographic reproduction of it was issued from Switzerland some time ago when a copy was procured from the Baker Company at Cleveland, O. The book can be obtained through G. E. Stechert & Company, 151 West 25th Street, New York. It is still a valuable reference book. ($6.00).

Recovery and Manufacture of Waste Paper, The—By James Strachan, of the Donside Paper Company, Aberdeen, Scotland. This is a most useful and suggestive work which can be recommended to all practical papermakers. It is on sale by Spon & Chamberlain, New York City. ($4.50).

Technical Methods of Analysis—By Roger Griffin. Chapter VIII. describes methods of analysis of cellulose in wood, woodpulp, black liquor, white liquor, the various chemicals used in making pulp and paper. The physical testing of paper is discussed. (Arthur D. Little, Inc., Cambridge, Mass.)

Researches on Cellulose—By Cross & Bevan. A series of publications in three volumes of value to the practical papermaker as dealing with the chemistry of cellulose. The latest edition should be purchased as well as the earlier issues. The dates are: 1895, 1900, and 1905. (D. Van Nostrand Co., New York. $5.50).

Testing of Wood Pulp, The—By Sindall & Bacon. This book is divided into two sections: (1) The sampling and testing of pulp for moisture; (2) The testing of wood pulp for its bleaching qualities. It also contains a chapter on the Chemistry of Bleaching. Published by Marchant, Singer & Companw, 47 St. Mary Ave, London, E.C. (D. Van Nostrand Company, New York, $3.00).

Text Book of Papermaking, A—By C. F. Cross and E. J. Bevan, Fifth edition, containing additional matter, and in part rewritten with collaboration of J. F. Briggs, (New York, Spon & Chamberlain, 120 Liberty Street, $10.00).

Treatment of Paper for Special Purposes, The—By Louis Edgar Andes. The Processes of manufacture for a variety of paper products are outlined in this book of 239 pages. It is not a working manual, though it contains a collection of formulas and furnishes for parchment and greaseproof papers, as well as for a whole series of novelty papers. The book is for sale in the United States by D. Van Nostrand Co., New York. ($3.00).

Wood Pulp and its Uses—By Cross, Bevan & Sindall. (D. Van Nostrand, O., 8 Warren Street, New York. $3.00).

Chemistry of Pulp and Paper Making—By E. Sertermeister, of S. D. Warren Co. The latest and best on the subject. It represents American practice and knowledge. (John Wiley & Sons, New York. Renouf Pub. Co., Montreal. $6.00).

GERMAN BOOKS.

Papierpruefung—By Wilhelm Herzberg. Fourth edition 1915. Julius Springer, Berlin.

Die Chemie der Cellulose—By Carl G. Schwalbe. 1911. Borntraeger Bros., Berlin.

Die Chemische Betriebskontrolle in der Zellstoffund Papierindustrie—By Carl G. Schwalbe and Rudolph Sieber, 1919. Julius Springer, Berlin.

Warmerwirtschaft in der Papier-und Zellstoff Fabrication—By G. Lest. M. 16.

Buntpapier Fabrication—By August Weichelt. M. 30.

Handbuch der Papierfabrikation—By Carl Hoffman. 2 Bander. Ungeb. M. 200.
Zurich, Switzerland.

Lexicon der Papierindustrie—By Lenart Akesson-Amerin. Second edition, 1905. Technische Bureau.

FRENCH BOOKS.

Publications in French on paper technology are listed by the publisher of Le Papier 16 Rue du Rocher, Paris, as follows:

Fabrikation du Papier—By A. Blanchet. (6 fr.)

Alfa er Papier D'alfa—By H. de Montessus de Ballore. (9 fr.)

La Frabikation des Celluloses de Papeterie Autres que Celle du Bois—By H. de Montessus de Ballore. (24 fr.)

Vegetauxpropres a la Frabication de la Cellulose et du Papier—By L. Rostaing, M. Rostaing and Fluery-Pierce du Sert. (20 fr.)

..Precis Historique, Descriptif, Analytique et Photo-Micrographique des Vegetaux propres a la fabrication de la Cellulose et du Papier—By L. and M. Rostang and Fluery Percie du Sert. (20.)

Le Papier...Etude sur sa Composition—By E. Hoyer (6 fr.)

L' Helice en Papeterie—By E. Pistie. (4 fr.)

ON A C.P.R. PULLMAN CAR.

Out of the Canadian Wilds, just after passing an isolated settlement, there has come into our car an Englishman. He was self-heralded for quite a time in unmistakable accents from the passageway.

His entry revealed a rather tall individual of three-quarters age, attired as woodsman or game hunter. In one hand he carried by a handle at the top end, a round elongated cotton duck pack, and in the other what appeared to be a pair of field glasses in a leather case. He was very erect, clean shaven, highly weathered and leathery, altogether of a type which was familiar in the days that preceded prohibition.

He had undoubtedly imbibed too freely of the cup that inebriates, for after being allocated to a vacant section of the Pullman, his state of mind required that he continue to voice a mental situation known only to himself.

A little before 6 P.M. he showed signs of interest in his pack, lifted it and placed it between his knees, opened it and extracted from its depths a monocle, which he gravely hung by its neck ribbon on a window hook. He then proceeded to discharge a duty to his fellow men.

After considerable diving into the bag he produced the articles he was looking for, and laid them upon the opposite seat, stood up and began to undress by removing a heavy leather-lined coat, a leather vest, a knitted waistcoat and a flannel shirt, which he pulled off over his head. This process exposed a fairly clean looking lambs wool under garment, which he mercifully was not tempted to take off. He carefully folded the discarded apparel and pushed them forcibly into his pack.

From his effects he next produced a starched, rather soiled and much wrinkled "Dickie" and hung it on his chest, then a collar and a black bow tie were adjusted in place.

While this was in process of execution he behaved exactly as though his astonished audience did not exist. He never once looked at a single person as he solemnly lifted up and shook out what proved to be a very wrinkled Tuxedo dinner jacket and put it on over his woollen garment and "Dickie."

Then turning completely around, he squared his shoulders, at the same time raising both elbows sideways, puffed out his chest and gave a consequential little cough to the audible satisfaction of the entire car. He then sought his monocle and donned it, though he did not at this time place the glass in his eye, and sat down.

By a coincidence, almost immediately the black porter appeared for the first time during the entire performance and the look on his face was marvelous to behold, at the moment when he first saw the transformation in his latest guest. The guest himself at once arose, as if at the expected invitation of the porter, and announced that he was "ready for dinnah."

The figure was most comical as he strode out of sight, a contrast in black and tan, as his khaki pants were encased at the extremities in heavy half-knee length leather laced boots.

When I, with others, reached the dining car there he was, at a table by himself, a really distinguished looking man, sitting with head erect, a perfect gentleman to outward appearance—from the table upward.

He is now enjoying his after dinner cigar in the smoking room, his roughly clothed legs and feet exposed and utterly belying the elegance of his upper half but he is as sober as a judge. So far as I know, he has spoken to no one but the porter, nor anyone to him. He is not now talking to himself and does not appear in the least embarrassed by the curious glances and suppressed mirth of his fellow travellers.

The poor fellow came suddenly among us from out of the silent snow-filled woods, a pitiably lonely being, apparently a misguided relic of other days. I would like to know his history, from whence he came, to what mode of life he is going, and under what circumstances, and where he learned to put on a dignified comportment amongst his fellow men.

Maybe he holds a proof that after all, there are "More things in heaven and earth than are dreamed of in our philosophy."

Note: Having given our readers the chance to enjoy this bit of humor as well as to guess as to its origin, it should be explained that it is an extract from a letter written by J. B. Purves of the Port Arthur Shipbuilding Co. to his home office. Surely selling pulp and paper machinery has some compensations.

FIRE AT RUTHERGLEN.

A portion of the machine house roof and other serious damage was done by a fire which broke out a few days ago in the Clyde Paper Mills, Rutherglen, N.S.



As seen by the N. Y. Tribune's Cartoonist.

OUR GREATEST SCIENTIFIC OPPORTUNITY — WOOD HYDROLYSIS.

(Editorial from The Canadian Chemical Journal)

With the food problem throughout the world so acute that famine prices prevail, and with our gasoline supply rapidly being exhausted, can we much longer refuse to consider wood waste and other cellulosic materials as a source of relief for these conditions? Has the time not come when adequate steps must be taken to prove or disprove the claim that in these forms of material we have a possible solution for both these problems? Sir William Crookes predicted that the two greatest chemical achievements of the present century in relation to the welfare of mankind would be the fixation of atmospheric nitrogen and the conversion of cellulose into sugar and alcohol, and it seems likely that this prediction will be sustained.

Cellulose and starch have the same chemical composition, and it has been pretty well demonstrated by the work of Classen, Tomlinson and others that at least a goodly percentage of cellulose, like starch, can be commercially converted into sugar, and in this way cellulose waste made to replace or supplement starchy foods for certain purposes.

Cellulose is the most prolific product of nature, and of this there can never be a shortage, since it is continually reproduced in almost inconceivable quantities and most of this ultimately goes to waste. For example, it is estimated that 20,000,000,000 lbs. of wood is wasted in Canada in connection with the timber industry alone, and in addition to this the amount of straw and other forms of cellulosic waste must be many times greater.

It is impossible to predict what might be accomplished in this field if sufficient properly directed research was applied, but even on the basis of yields which have been commercially demonstrated, our wood waste is apparently sufficient to produce 2,500,000,0000 lbs. of sugar. That this sugar, if produced, might be the equivalent of an equal weight of grain for making alcohol or even for feeding stock, looks reasonable. If we were destroying or wasting 40 or 50 million bushels of grain every year it would arouse national consternation, and yet this seems to be just about what we are doing in this case, without a thought as to the economic loss involved.

Future developments may even show that this amount of wood waste is equivalent to our annual production of wheat in potential value, should its theoretical conversion into sugar be accomplished.

In view of these facts and possibilities, does it not look as if the problem of wood hydrolysis, as its conversion into sugar is termed, represents the biggest fundamental proposition in the whole field of industrial research?

Canada, with its huge undeveloped area, produces cellulose in almost infinite quantity. We are, therefore, in an extremely favorable position to take the lead and gain the commercial and economic advantages which its use along these lines must bring, just as we are now doing in the case of pulp and paper.

The problems thus suggested and the possible results obtainable seem of such national and economic significance that it becomes a matter which should not be let entirely to private enterprise, but deserves to be taken properly in hand by the government and something commensurate with its present importance accomplished.

It is a remarkable thing that it still remains so difficult to impress non-technical government officials with a matter of this kind. Those who have been concerned with the industrial problems of our Forestry Department have been working to date under such a handicap that it has been difficult for them to impress the value of the work they might be doing upon higher officials. We need at Ottawa a strong group of technical men, who are not mere servants in the house of the government. The day has gone when national resources may be obliterated without some effort at replacement or full development. It would not then be out of order for either the Dominion Government alone, or working in conjunction with those provinces where the matter is of special importance, to undertake to demonstrate in a practical way that our great present wastage in wood might be profitably stopped. What clogs such action is a lack of conception and vision on the part of lumbermen, paper makers and the government. This development is on national importance and should be undertaken as a national measure in the interests of the public generally. Some day it will be done, but the time for action is past now, and every hour the waste goes on. Let us not only hand down to future generations a noble heritage of principles, but also a few things well done when they should have been done.

USE N.Y. FORESTS TO SUPPORT THE STATE.

New York, May 6.—"When Gov. Miller in his first annual message on Jan. 5 declared that a plan ought to be devised to utilize timber that is going to waste annually in the state forest and at the same time to use the forests to produce a substantial revenue for the state, he pointed the way to the practical conservation of this tremendously valuable resource," says Dr. Hugh P. Baker, Executive Secretary of the American Paper and Pulp Association.

"The forests, if used properly, will contribute an increasing share toward meeting the expense of government in this state and assist materially in reduction of its debt. It is unreasonable and uneconomic that the state should have nearly two million acres of land, much of it capable of giving direct returns to the state, and that without injuring its future productiveness or value, but rather increasing it, locked up by constitutional provision which actually does not let us use a bit of the timber for our industries or our people.

"Our great fundamental wealth producer, the soil, should not only give to the state all that we can get from it through agriculture, but that we should make the great empire of our forest land of over ten million acres so productive that it may assist in providing revenue as the forests of France, Germany and Scandinavia provide great revenues for those countries.

"Let the state take hold of its forests in the same businesslike way that it has taken hold of its agricultural lands. Make every tax payer learn the slogan, "Use our Forests Properly for the Support of the State."

Why not ask your minister to preach a Safety First sermon once a month? It is something that is badly needed in every community.

PULP AND PAPER INDUSTRY IN NEWFOUNDLAND.

Next in importance to the fisheries of Newfoundland is now the pulp and paper industry. The Anglo-Newfoundland Development Company's mills at Grand Falls have been maintaining an output of 215 tons of newsprint paper daily, with a surplus of mechanical pulp, and the smaller pulp mill at Bishop's Falls has been turning out 100 tons of the latter commodity daily in the same way. Logging operations for pulp wood were not actively prosecuted by either company in the winter of 1919-1920 because of the exceptional severity of the weather which blocked the railways, the highways and even the trails through country from January until April, making it difficult either for men to work or for supplies to be furnished them, consequently the former company used most of its reserve stock of logs, and has therefore had to make plans to operate on a largely increased scale this autumn and the coming winter. As this is written the company has 2,500 men "in the woods" and some 5,500 on its pay roll altogether, and is paying out $600,000 a month for labor. It is expected that a cut of 250,000 cords of pulp wood will be made during the next few months, of which about 50,000 will be held as a reserve, the rest being manufactured during 1921. The smaller company is planning on a proportionate cut, but the recent drop in the price of mechanical or ground-wood pulp of the United States may affect its operations. A Norwegian company is well advanced with the construction of pulp mills on the Gander river, the next big valley south of the Exploits, in which the former companies are located; but it is not likely to be ready for manufacturing before the end of next year, if then. Other projects for mills are more or less tentative at present, but may materialize during 1921.

The subsidiary industry of cutting and sawing logs for conversion into lumber, for export to a small extent, but mainly for local requirements, has been pursued at full capacity for most of the year by the 12 large and 480 small mills engaged, whose total output realized 225,000,000 feet, board measure, valued at about $1,500,000, and employing some 2,000 men for part of the year at least. A state of exceptional depression has come upon that industry during the autumn, causing a collapse in prices, with the result that in one extensive lumbering section, White Bayon, the North East Coast business people will not "supply" or make advances of food and other material to the settlers to enable them to engage in logging the coming winter for conversion into lumber next season, and there is already a state of grave destitution existing in that region. Elsewhere conditions are better, because the people combine lumbering with fishing to a larger extent, but inactivity in the lumbering industry is deemed altogether probable for next year. So serious, indeed, is the situation that the Government has agreed to temporarily suspend the operation of the law prohibiting the export of logs for pit props or pulp wood, so that those in distress may have an opportunity of securing a livelihood by cutting and shipping this material.

The growing magnitude of the pulp and paper industry for the past seven years can be seen by the following figures of export:—

	Pulp.		Paper.	
	Tons.	Value.	Tons.	Value.
1913-14	51,605	$372,676	40,077	$1,795,488
1914-15	48,451	379,220	40,556	1,817,193
1915-16	22,892	197,608	62,527	2,801,769
1916-17	27,413	351,072	33,389	1,510,440
1917-18	11,494	111,358	34,060	2,302,243
1918-19	71,151	475,178	21,819	1,545,244
1919-20	19,864	334,276	80,719	4,725,660

— Sir Patrick McGrath, in the Montreal Gazette.

ADVERSE TRADE BALANCE WITH U.S. IS LESS

By FREDERIC HUDD.

Canada's total trade with the United States during the month of February was $79,000,000, as against $104,000,000 for February of last year, a decrease of $25,000,000, according to the *Monthly Summary of Foreign Commerce* of the United States.

United States exports to Canada during February were $46,000,000, a decrease of $18,000,000.

United States imports from Canada in February were $33,000,000, a decrease of $7,000,000.

During the eight months ending February, 1921, Canada's total trade with the United States was $1,011,000,000, an increase of $106,000,000 compared with the eight months ending February, 1920.

United States exports to Canada in this period were $593,000,000, an increase of $46,000,000. United States exports to the United Kingdom decreased over $500,000,000, and to France $117,000,000. Thus, while the volume of United States exports to Canada continues to increase, United States exports to other principal countries show a striking decrease.

United States imports from Canada during the eight months ending February, 1921, were $418,000,000, an increase of $59,000,000. United States imports from the United Kingdom in this period decreased $77,000,000, and from France $12,000,000. United States imports from Germany increased nearly $45,000,000. Thus, while United States imports from Canada show a substantial increase, United States imports from other principal countries, with the exception of Germany, show a decrease.

Canada sold $38,000,000 more goods to the United States in the eight months ending February, 1921, than the whole of South America sold to the United States, and nearly double what the United Kingdom sold to that country.

Canada bought from the United States $154,000,000 more goods than the whole of South America bought from the United States and more than one-half the amount bought from that country by the United Kingdom.

The adverse balance of Canada's trade with the United States for the eight months ending February, 1921, was $175,000,000, as against an adverse balance for the corresponding period ending February, 1920, of $188,000,000 — a decrease of $13,000,000. The United Kingdom's adverse balance of trade with the United States decreased by $428,000,000 and France's adverse balance of trade by $107,000,000. Germany's adverse balance of trade with the United States increased $119,000,000. — Weekly Bulletin.

An ounce of prevention is worth a pound of cure, but it is just as well to be provided with both.

BROADSIDES — THE TRAIL BREAKERS OF BUSINESS.

The following is the text of a typical "broadside", sent out by the Canadian Pulp and Paper Association. It is effectively printed on buff cover paper in black and red across the two inside pages. Page one shows a trader on snowshoes, breaking a trail for his team of huskies and their loaded sledge:—

Vivid, glowing personality that grips the prospect's attention and holds it till the sales message is driven home — that is the first requisite of a successful broadside. Broadsides, are the trail breakers of business, blazing the way in new territories for bigger sales.

Like a salesman, the broadside must be dressed to fit the part it is to play. The copy should carry a straight man-to-man talk, spoken in a straightforward manner. When a "stunt" is used on the outside fold to get the prospect's attention, it should bear some direct relation to the copy. Otherwise, the man who receives it may feel that he has been inveigled into reading the broadside under false pretences, and thus a sale is lost.

The type should fit the spirit of the copy. Above all things, it must be easy to read. Odd layouts that puzzle the reader's eye and distract his attention from the copy are out of place in a broadside.

Size? Large enough to carry the sales message, small enough to be easily handled. A broadside so large that it resembles a newspaper is very apt to be a costly failure. Remember — a broadside is intended to be read at a man's desk; it is *not* a ten-sheet poster.

Mailed without an envelope, broadsides must be made of stock sufficiently strong easily to endure the sometimes rough handling of the post. A torn broadside stands as much chance of making a sale as a slovenly salesman.

When no half-tone cuts are used, good cover stock makes an ideal broadside. The wide range of colors, weights and prices of Canadian cover stocks makes it easily possible for the printer to select a stock to fit the job.

The next time you have a broadside to print, look over the sample books of dealers in Canadian-made cover stocks. They're brimful of good suggestions, not only for the stock itself, but for the striking color combinations that will increase the effectiveness of the broadside. These sample books are veritable gold mines of profitable ideas. Form the habit of using them.

Broadsides printed on Canadian-made stock build more business for your customers. And that means more business for you.

Help to bring Canadian dollars back to par by advertising Canadian goods on Canadian paper.

INCREASE IS $180,000.

The total turnover of the book and publishing committee of the Methodist Church, which controls the Methodist Book Room and the printing of the various Methodist publications, has increased $180,000 over the turnover of last year, according to the report submitted at a meeting of the committee yesterday. The total amount of business done during the year was nearly $1,500,000. Although the turnover was larger the net profits decreased and were less than half as large as they were last year.

T. A. P. P. I. ACTIVITIES.

The Technical Association of the Pulp and Paper Industry has a Bureau, at 542 Fifth Ave., New York, for information concerning vacant positions in the engineering and chemical departments of mills, and less frequently by employers for applicants for positions. Among applicants for positions there are special inquiries on file at present, as for instance, from a research chemist in sulphite work, an engineer in mill construction and papermaking, chemist versed in paper tinting, and a book and newsmill superintendent. Mills seeking technical men and technical men seeking positions should make freer use of the Technical Association's facilities for supplying the needs of the industry in employment matters.

Plans for Dyestuffs Investigation.

Ross Campbell, Department of Technical Control, American Writing Paper Company, Holyoke, Mass., has been named by the President to succeed Dr. Otto Kress, as chairman of the Committee on Dyestuffs. One of the first tasks of this committee will be to check up the chapter on dyestuffs in the vocational education textbook. The Dyestuffs Committee has some ambitious plans for reporting on the performance of different dyestuffs under different conditions, their peculiarities, different combinations in which special dyestuffs should or should not be used. etc. But the carrying out of these plans depends on the co-operation that can be obtained from the members generally and in particular from the companies by which members are employed. If the mills are willing to release certain data, the committee can act as a clearing house and supply complete information on available paper colors to the whole industry. Mr. Campbell's associates on the Dyestuffs Committee comprise: Charles G. Bright, Kimberly-Clark Company, Neenah, Wis.; Clarke Marion, Champion Coated Paper Company, Hamilton, Ohio; Kenneth T. King, E. I. du Pont de Nemours & Company, 1114 Tribune Building, Chicago, Ill.; Clark C. Heritage, National Aniline & Chemical Company, Buffalo, N.Y.; Carl C. Schneider, Knowlton Bros., Waterton, N.Y.

GOODBYE, CARELESS WORKMAN.

The day is fast approaching when a careless workman will be unable to find a steady position, if any position at all, for he will find that every employer is demanding that every workman be a progressive Safety man. Your scars and missing fingers, glass eyes and wooden legs will no longer be your mark of recommendation, as of yesterday, but instead will be an indication of carelessness and with only an occasional exception denote an inferior class of workman.

There is but one solution for you. You will be put through the sorting table, and if you do not measure up to the safety standards you will have to go. Perhaps you will ask what are the safety standards. The safety standards are; Thinking, co-operation, better judgment, honest day's labor and a constant thought of safety first and putting such thoughts into action.

Mr. Workman, it's up to you. If you weaken you are bound to go under, so buckle up, show your boss that you can think, and that you will co-operate in every respect. Don't take chances, don't watch the clock, produce in an efficient manner, work with the confidence that "I can do it," for confidence is the foundation of success. Remember—The brand of "Safety First" represents efficiency.

C. A. M. in "Common Sense."

Technical Section

REVIEW OF RECENT LITERATURE.

E-2; K-10. Sizing Substance from Sulphite Waste Liquor. Ger. patent No. 307,663, FELDMUHLE PAPIER und ZELLSTOFFWORKS A.-G., Berlin, Jan. 27, 1913. (Addition to Ger. patent No. 307,087) **J. Soc. Chem. Ind.,** xxxix, 16A, (Jan. 15, 1920). The liquor containing the ligninsulphonic acids is poured into a hot concentrated solution of caustic alkali and the mixture heated until the action is complete. The reaction is quicker, more certain and more convenient in operation in this way than if the alkali solution is added to the sulphite liquor. The lignin substances are separated from the resulting solution by treatment with acid, and redissolved in alkali for use in paper-sizing.—A. P.-C.

F-2. Dry Distillation of Pulp Waste Liquors with Strong Bases in Presence of Steam. Br. patent No. 120,724, E. L. RINMAN, Djarsholm, Sweden, Oct. 30, 1918. **J. Soc. Chem. Ind.,** xxxix, 15A (Jan. 15, 1920). Waste liquor from the manufacture of pulp from wood, straw, or other materials by the soda process, waste liquors produced by boiling vegetable matters with NaOH until the cellulose is dissolved or waste liquors from sulphite pulp manufactured, after boiling with CaO, are mixed with suitable proportions of NaOH and CaO, the mixture is concentrated by evaporation until it contains about 25 per cent of water and then subjected to destructive distillation, preferably by means of hot gases in the presence of superheated steam. The temperature is maintained below 200° Cent. until the water has been substantially driven off, then between 200 and 300° Cent. until NH_3 was, and NaOH have distilled over, and, lastly, between 300 and 500° Cent. during the formation of acetone and, later, of light oils and heavy oils. The proportions of bases to be added per 100 parts of organic matter range between 40 and 65 parts of Na_2O and between 30 and 40 parts of CaO.—A. P.-C.

K-6. Cleaning Material from Waste Paper. Ger. patent No. 303,302, REIS UND COMPANY, Friedrichsfeld, May 26, 1917. **J. Soc. Chem. Ind.,** xxxix, 15A (Jan. 15, 1920). Waste from paper industries, more particularly from paper spinning and weaving, is softened and made absorbent by treatment with alkalis, inorganic or organic acids, N_2SO_3, or chlorine compounds, and then bleached and worked up into "cleaning waste" in the usual manner.—A. P.-C.

L-6. Fibrous compositions. Br. patent 143,258—1919, E. E. MOUGEON, Monteux, France, July 21, 1920. Chem. Met. Eng., **23,** 752, (Oct. 13, 1920). Vegetable fibers are mixed with casein in the form of a paste and the mixt. is molded under press. and heat. In an example, fibers are immersed in a bath containing 1 kg. of casein paste consisting of 88% casein and 12% ammonia to 15 l. of water. The fibers are drained, placed in molds, compressed, and heated to abt. 130°C to drive off the water and ammonia. CaO, $MgCO_3$, $Na_2B_4O_7$, etc., may replace the ammonia. Articles may be ornamented by coating them with sawdust before molding.—A. P.-C.

L-7. Artificial filaments and fabrics. Br. patent No. 143,253—1919, L. DRUT, Villeurbanne, France, July 21, 1920. Chem. Met. Eng., **23,** 752, (Oct. 13, 1920). An artificial textile fabric is made from filaments prepd. from solns. of, for example, viscose, cuprammonia cellulose, gelatine or cellulose acetate, and in which are incorporated bubbles of air or inert gas; fabrics manufd. of such hollow filaments are very light, opaque, and soft to the touch.—A. P.-C.

L-7. Strengthening Paper Yarn. Ger. patent No. 302,551. O. RUFF, Breslau, Germany, July 6, 1917. **J. Soc. Chem. Ind.,** xxxix, 15A (Jan. 15, 1920). The paper, before spinning, is soaked in a previously heated solution of crude cresol, formaldehyde and some alkali, either in the spinning machine or in a separate process. A larger proportion of alkali is required for sulphite pulp than for sulphate pulp. After spinning, the yarn and the material woven therefrom is heated for some time at 80° Cent.—A. P.-C.

L-0. Acetic Acid from Cellulose. Br. patent No. 134,265, POWER GAS CORP., Ltd., and H. LANGWELL, Stockton-on-Tees, Oct. 1, 1918. **J. Soc. Chem. Ind.,** xxxix, 38A (Jan. 15, 1920). A mash of cellulose material, such as sulphite pulp, or straw, is inoculated with fermenting vegetable matter e.g., stable manure, and maintained under aerobic conditions at a temperature between 25 and 60° Cent. The cellulose undergoes acetic fermentation, and $CaCO_3$ or other suitable substance is added to neutralize the acid as it is produced. The mash must contain nutrient salts and nitrogenous matter, and some sugar or other readily fermentable substance may be added to induce a vigorous fermentation at the commencement. The temperature employed, within the limits stated above, influences the rate of fermentation, but not the yield of acid.—A. P.-C.

L-0. The Preparation and Analysis of Cattle Food Consisting of Hydrolyzed Sawdust. E. C. SHERRARD and C. W. BLANCEO, Forest Products Laboratory, Madison, Wis. **J. Ind. & Eng. Chem.,** xiii, 61-5 (Jan. 1921). Eastern white pine sawdust, representative of the waste mills cutting the species, was obtained from a mill in Minnesota. No effort was made to remove the bark or other foreign substances ordinarily present in this material. The sawdust was treated in the same manner as for the production of ethyl alcohol from wood; i.e., it was digested with 1.8 per cent sulphuric acid for 15 to 20 minutes under a steam pressure of about 120 lb. per sq. in. Sufficient water was added along with the sawdust to raise the ratio of water to dry wood to about 1.251. After the steam pressure had been blown off to the atmospheric pressure, the treated sawdust was removed from the digester, and a large portion of the acid liquor removed by means of the centrifuge. The centrifuged material was extracted with hot water to remove the remainder of the acids and sugars, the leach water was added to the centrifuged liquor and the whole almost neutralized with calcium carbonate. After separating the sludge the liquor was evaporated under reduced pressure to the consistence of a thick syrup. The leached material was screened through a 6-mesh screen the screenings dried, mixed mith sirup and the whole dried to about 12 percent moisture. Leaching experiments carried

Sample	Moisture	Solubility of sample in Cold Water	Hot Water	Ether	1% NaOH	Acetic Acid	Pentosan	Methyl Pentosan	Cellulose	Pentosan in Cellulose	Methyl Pentosan in Cellulose	Lignin	Crude Fiber	Reducing Sugars	Ash
Unhydrolyzed dust 80-100 mesh	6.00	8.81	10.23	4.13	23.16	....	....	....	56.16	....	....	31.45	....	....	0.82
	....	....	....	....	....	1.38	9.40	2.37	57.07	8.00	1.65	30.65	63.87	None	....
	6.46	8.70	10.08	4.11	22.86	....	....	....	....	....	....	....	....	....	0.80
Average	6.23	8.75	10.15	4.12	23.01	....	....	....	56.61	....	....	....	....	....	0.81
Unhydrolyzed dust through 100 mesh	6.38	9.21	10.78	4.88	25.39	....	....	....	53.76	....	....	32.15	....	....	1.52
	....	....	....	....	....	0.91[1]	9.86	2.83	54.45	....	....	30.50	60.81	None	....
	6.39	9.23	10.95	4.84	25.76	....	....	....	....	....	....	....	....	....	1.50
Average	6.39	9.22	10.87	4.86	25.57	....	....	....	54.11	....	....	....	....	....	1.51
Unground wood meal through 100 mesh	4.15	30.17	30.64	3.94	43.24	....	....	....	36.01	....	....	37.21	....	....	4.94
	....	....	....	....	....	0.78	4.38	2.15	35.97	....	....	29.62	46.88	17.47	....
	4.09	30.59	30.69	3.77	42.59	....	....	....	....	....	....	....	....	....	4.92
Average	4.12	30.38	30.66	3.85	42.92	....	....	....	35.99	....	....	....	....	....	4.93
Ground wood meal through 100 mesh	3.64	31.11	28.23	3.80	40.23	....	....	....	37.77	....	....	39.36	....	....	3.35
	....	....	....	....	....	0.65	4.66	2.50	38.03	....	....	31.46	49.31	16.20	....
	4.11	27.55	28.39	4.06	39.04	....	....	....	....	....	....	....	....	....	3.27
Average	3.88	29.33	28.31	3.93	39.64	....	....	....	37.90	....	....	....	....	....	3.31
Ground wood meal through 80-100 mesh	5.38	.....	.....	....	.....	....	....	....	37.46	....	....	.....	.....	.....	....
	....	.....	.....	....	.....	....	....	....	37.23	....	....	.....	.....	.....	....
	....	.....	.....	....	.....	....	....	....	.....	2.83	3.83	.....	.....	.....	....
Average	....	.....	.....	....	.....	....	....	....	.....	....	....	.....	.....	.....	....

1 .This value is undoubtedly somewhat low since the condenser was accidentally removed before the flask had sufficiently cooled.

Attention is directed to the changes resulting from the treatment. The cellulose obtained from the digested wood differs from the original wood in its behavior towards alkali. In the former practically all of the cellulose is converted into a viscous semi-transparent mass by 17.5% sodium hydroxide, while in the latter over 50% is unaffected. A.P.-C.

out on the digested dust indicated that five complete washings with a quantity of water equivalent to the weight of the wood are necessary to remove the sulphuric acid. The sugars are found to leach with somewhat more difficulty than the acid. It is pointed out that the sugars contained in the moist product are not appreciably affected by drying at temperatures ranging from 75 to 80° Cent. While some decrease is noted in total reducing sugars, the loss is apparently due to the removal of volatile reducing substances. The analysis of the wood meal and of the untreated pine sawdust is shown on the accompanying table.

R-1. Pulp and paper industry in New Brunswick. COLIN McKAY. Paper, 22, (Oct. 6, 1920). A brief description of the conditions under which pulp and paper mills can be established in N. B. and of the special inducements offered by the provincial govt. to attract capital.—A.P.-C.

R-11. Vocational training in the paper trade.—J. C. WRIGHT. **Paper Trade J.**, lxxii, 3 (Jan. 13, 1921); 4 (Jan. 20, 1921); 5 (Jan. 27, 1921); 6 (Feb. 3, 1921); 7 (Feb. 10, 1921).—Plans for specific vocational training, drawn up by Mr. Wright, the assistant director of the Federal Board of Vocational Education, after a survey of the pulp and paper industry. The data collected indicates that the greatest need is for foreman training and for trade training on the basis of both the preparation of workers for promotion and the technical improvement in certain occupations. The report is too voluminous to be abstracted.—C.J.W.

R-12. The cost system of Dill & Collins Co. JOHN B. HIPWELL, DILL & COLLINS, Co. Paper, 12-3, 32, (Oct. 6, 1920). A description of the conditions before the installation of the system, of the details of the acctng. system, of the manner in which it was put in, and of the results secured from its use.—A.P.-C.

R-12. The human factor in cost accounting. F. H. FIGSBY. **U. S. Paper Maker,** lxiii, 3 (Jan. 1, 1921). Emphasizes the importance of the man responsible for the assembling and coordinating cost data for the guidance of the management in the control of business. C.J.W.

R-12. Standard classification of expense.—U. S. Paper Maker, lxiii, 3 (Dec. 15, 1920).—Report of the cost committee of the National Paper Trade Association, and a letter from Ernst & Ernst regarding the new system being considered by American paper merchants.—C.J.W.

R-13. Fifth Convention of the Cost Association of the Paper Industry, New York, Sept. 27, 28, 1920. Paper, 9-11, 24,26, 38, (Oct. 6, 1920). A brief acct. of the meeting, giving retiring president Burchell's address in full and abstracts of the other speeches and papers presented.—A.P.-C.

R-13. T.A.P.P.I. Convention, Saratoga Springs: Sept. 1-3, 1920. Chem. Met. Eng., **23,** 508-10, (Sept. 15, 14, 1920); Paper, 9-13, 28, 30, (Sept. 8, 1920), Pulp & Paper **18,** 967-70, (Sept. 16, 1920); 1028-9, (Sept. 30, 1920), 1044, (Oct. 7, 1920). Account of the meeting, including a description of the visits to the pulp and paper mills and other plants allied to the paper ind., social features, abstracts of speeches, and reports of the Executive, Bibliography, Sulfite Pulp, Heat, Light, and Power, Paper Testing, Soda Pulp, Standard Methods of Testing Materials, and Vocational Education Committees.—A.P.-C.

R-13. Meeting of the Northern New York Division of the American Pulp & Paper Mill Superintendents' Association, Glens Falls, Sept. 15, 1920. Paper, 9-10, (Sept. 22, 1920). A brief acct. of the meeting.—A.P.-C.

204,319; The method of drying sheet material consisting in feeding it into and out of a vacuum chamber without breaking the vacuum and subjecting the sheet material while in the vacuum chamber and under substantially little or no tension to the action of one or more electric heating coils. Claims allowed 34.—A. P.-C.

A village girl eloped in her father's clothes. And the next day the local paper came out with an account of the elopement headed:

Flees in Father's Pants.

Note.—The Spanish River News does not specify that father behaved like the Old Scratch.

PULP AND PAPER NEWS

In conjunction with the Ontario Associated Boards of Trade and Chambers of Commerce, the Toronto Board of Trade has arranged a trip to New Ontario for the merchants and business men of Old Ontario. The trip will be made by special train leaving Toronto on the evening of June 12 and will extend over six days. All of the pulp and paper companies' mills and the various mines in the north country will be visited.

The Ontario Government forestry department, under Mr. E. J. Zavitz, intend to carry out extensive plans along provincial forestry lines this summer. During the war comparatively little advantage had been taken by Ontario municipalities of Government encouragement along that line but this year it is hoped that real progress will be made. Seven million seedlings, mostly pine and spruce, with some hard woods, will be set out in the Forestry Department's Norfolk county reservation from which it is expected to get a fifty per cent yield. It is also contemplated to open two new nursery centres in Eastern Ontario. Simcoe County, with its many miles of waste land, is said to be one of the sections of the province upon which the department has taken up the Government's forestry proposition.

Among the recent incorporations by the Ontario Provincial Secretary's Department are the following: The New Idea Publishing Company, Limited, the Gould Baird Poster Co., Limited, and Print-Craft, Limited. All are authorized to engage in the printing and publishing business, with allied branches.

A late despatch from New York says: Seven large paper mills in the United States and Canada, employing approximately 9,000 men, shut down today because of failure of workers and owners to sign new agreements to replace those which expired last night. According to reports received here by the Labor Bureau, Inc., the mills which closed Wednesday were: Union Bag and Paper Company, Hudson Falls, N.Y.; Sheboygan, Wisconsin and Kaukauna, Wis.; St. Maurice Paper Company, Ltd., Three Rivers, Que.; Anglo-Newfoundland Company, Grand Falls, Nfld.; Abitibi, Ltd., Iroquois Falls, Ont; Espanola, Ontario and Sturgeon Falls, Ont.; St. Regis Paper Company, Deferiet, N.Y.; Hanna Paper Company, Norwood, Norfolk, and Raymondville, N.Y.

Only two paper mills in northern New York are working today as a result of a walkout this morning of 1,100 union men, employed by the St. Regis, Hanna Paper Corporation and other plants. The men refuse to accept a 30 per cent cut.

The Sherman Paper Company at Felts Mills and the Degrasse Company plant at Pyrites are not affected, having arrived at settlements with their employees.

The Rudd Paper Box Company, Richmond Street, Toronto, will have an exhibit of folding and set-up boxes at the convention of Confectionery, Biscuit and Chocolate Industries of Canada, to be held at the King Edward Hotel on May 17th and 18th. The firm is just now, and has been for some little time, carrying on an energetic Made-in-Canada direct mail advertising campaign, one of the features of which was the mailing to all egg and butter packers in the province a sample of the firm's cartons adapted to the egg and butter business. Enclosed with the samples are circulars containing hints on "How can we help you to sell more butter" and "How can we help you deliver your eggs without breakage."

The Mattagami Pulp and Paper Company, Limited, at Smooth Rock Falls, Ont., have just completed a big wood drive which comprised 160,000 cords, the wood having been successfully assembled at the company's mills. The company's programme of work and improvements has been pretty well rounded out now, which includes improvements to plant as well as the making of a model townsite.

We comment editorially this week on the circular letter to the shareholders of the Riordon Company, Ltd., dated the 6th instant, and signed by the five gentlemen, who were recently appointed a committee of directors to examine into the affairs of the Company and report on its financial position and requirements. With this letter were enclosed to the shareholders the balance sheets of the Riordon Company, Ltd., and its affiliated companies, the Gatineau Company, Ltd., and the Ticonderoga Pulp and Paper Company. The letter points out that the soundness and value of the Company's business are unquestioned; that its physical assets are among the most valuable of raw material resources of Canada; that its very large earning power has been demonstrated for many years past. The letter further intimates that a policy of rigid economy in operations and discontinuance of construction as far as possible is being instituted. This, also, is all to the good, if as the letter further states, the position of the company which it describes as "serious," is "due to commitments for construction and other expenditures having been undertaken before adequate financial arrangements were made," as well as to the world-wide reaction in general trade conditions. Finally the letter strikes an emphatic note of warning, to which, it would seem, the shareholders, in their own interests, would do well to give much weight and immediate heed. It states that unless $5,500,000 is raised by the first of next month, the Company will be unable to carry on business. It is now up to the shareholders to subscribe for the bonds —the issue of $5,000,000 ten year eight per cent, Mortgage and Collateral bonds of the Riordon Company, Ltd.—from the subscriptions to which, together with the amount to be received from the sale of the First Mortgage bonds which the Company is negotiating, the Company requires to be assured of this sum of $5,500,000, if they wish that the business shall be carried on.

Production of groundwood pulp has begun at the new plant of the Fort William Paper Co. at Fort William. Operations are to be extended until the capacity production of 120 tons of groundwood pulp per day is reached. Later on, a paper machine will be installed to carry the products to that further degree. A

ready market is found for the pulp in nearby parts of the United States, where it is made into finished paper. The pulp mill was completed and put into operation ahead of schedule, it not having been expected to be ready before the early part of June.

Among out-of-town visitors to Montreal during the past week were the following: Mr. John F. Taylor, sales manager of the E. B. Eddy Company, Ltd., Messrs. Lauren H. Gardner and C. V. Tyrell, president and vice-president of the Garden City Paper Mills Company, Ltd., Mr. George Carruthers, president of the Interlake Tissue Mills, Ltd., and chairman of the Technical section of the Canadian Pulp and Paper Association, and Col. W. E. Haskell, vice-president of the International Paper Company, Ltd.

Through the invitations of some of the mills in the St. Maurice Valley, the meeting of the Technical Section of the Canadian Pulp and Paper Association will, this year, be one of the visits to the St. Maurice Valley which will take in all the mills in that district. The date of the meeting has not yet been definitely decided on, but it will probably be about the middle of June.

From information which reaches us it appears that the very unfair duty on newsprint imported into the United States, for the proposal of which the Fordney Bill was responsible, will be dropped. It may be pointed out that this duty, as originally proposed, was to be at the rate of $15 a ton. But it was to be foregone in the case of Canada, provided this country did not enact what might be considered in the United States an unfair legislation. In other words, this duty was probably to be used as a lever wherewith to induce Canada to permit more freely of the exportation of pulpwood in unmanufactured form. However, we now gather, as mentioned above, that this proposal is to be dropped. In any event, it is worth pointing out that, had the suggested duty been imposed, the United States would, very largely, have been taxing its own capital, seeing that a large number of paper mills in Canada were built by American capital. If, as now seems likely, the proposal is to be dropped, this result will probably be due, in a great measure, to the brief submitted by Mr. S. E. Thomason, on behalf of the American Newspaper Publishers' Association. Mr. Thomason, in answer to a question as to why European newsprint should be allowed to come into the United States, said that, in normal times, the importation of European newsprint could not hurt the American or Canadian industry, as many who had once used it would not use it again at any price.

The Underwood Resolution, which was again introduced on the 25th April by Senator Underwood, has been referred to the Committee on Rules. The original Resolution called for a report to be made to Congress without naming a special time within which it should be made. But now a Report has to be made to the President on or before the 1st December next.

Last week, reference was made to the admirable circular letter sent out recently by the Canadian Pulp and Paper Association to some 4,000 Canadian manufacturers, urging the use of 'Made-in-Canada' paper. Replies from manufacturers to this letter continue to come in, and in highly gratifying numbers. Of those who have so far replied, by far the greater number state that they are already buying and using Canadian-made paper. Others, apparently, have bought foreign-made paper for so long, and are either so satisfied with it, or else have regarded it as so unimportant a matter, that they did not realize the underlying importance of the principle involved until it was brought to their notice by the letter in question. It may be anticipated that they will now give the same preference to Canadian-made paper that they urge others to give to the commodities which they themselves manufacture. But there are a certain number of manufacturers who have not been able to get their paper requirements filled in Canada. These requirements are nearly all for specialties; for example, fancy wrappings, fancy box papers, very fine tissue papers, and certain kinds of Bristol boards. Now that the demand for such papers has been shown to exist, Canadian paper manufacturers can be relied on to meet it in such a way that, in a short time, there will be no need for any Canadian business men to go outside Canada for any sort of paper at all, except possibly for small lots of very special lines.

It is estimated that between a thousand and fifteen hundred tons of pulpwood were destroyed at East Angus plant of the Brompton Pulp and Paper Co., by fire last Thursday night. The weather in this district has been unusually dry for several days and fanned by a slight breeze the flames had made considerable headway before being discovered.

The International Paper Co. has bought the ocean-going steel steam yacht "Speedy," which is now at Montreal, to facilitate visits to the company's Canadian properties.

The small hydroplane operated by the Laurentide Co. struck a hole in the air and soon after struck a tree. Although injuries to two of the occupants were serious they are on the road to recovery. The pilot and mechanician are experienced men and will not let this incident dampen their enthusiasm for the possibilities of forest mapping and fire inspection from aloft.

The ladies of Iroquois Falls have organized an Athletic Association. That town is a great place for outdoor sport.

The Brompton Club at East Angus is a commodious building, but it was too small for the crowd at the smoker held a few nights ago.

Mr. Garrett, who was recently with the Forest Products Laboratory, has joined the staff of the laboratory of the Belgo-Canadian Pulp and Paper Co.

CANADIAN ASSOCIATED PRESS TO BE WOUND UP.

At a meeting of the Canadian Associated Press yesterday it was unanimously decided to take the necessary steps to wind up the company.

Mr. Stewart Lyon moved a vote of thanks to Mr. Irving E. Robertson, president, for his services. In seconding the motion, Mr. C. F. Crandall, of Montreal, said they had hoped that the C.A.P. instead of vanishing from the field would have coalesced with the Canadian Press., Limited, and thus have carried on the fine tradition of public service established by the C.A.P., and thus perpetuate the memory of the great Canadian journalist, John Ross Robertson, who was the founder of the organization in 1904.

POWELL RIVER COMPANY BUYS TIMBER.

The consummation of a deal whereby the Powell River Company will secure nearly 5,000,000,000 feet of timber on the Queen Charlotte Islands, B.C., is now practically completed. The major portion of this timber is spruce and hemlock, which will be used in the company's pulp and paper plant. It is estimated that with proper care this timber will give a fifty-year cut under normal conditions. News Despatch.

UNITED STATES NOTES

While printers in job printing establishments throughout the country are either out on strike or bickering over the question of a forty-four instead of a forty-eight hour week, the printers employed in the Robert Gair Company's lithographing and job printing departments have voluntarily decided to work fifty-four hours a week instead of forty-eight without a cent's increase in pay. Between 500 and 600 employees are affected by this decision. Commenting on this action by his employees, Robert Gair, founder of the company, which ranks as one of the largest paper products establishments in the country, has this to say: "The men have gone to work fifty-four hours a week, with no increase in pay, in order to keep the wheels turning. There is not a union man in the shop from top to bottom and there never has been a union man there since I started the establishment sixty years ago." Referring to the union printers the country over who are balking on the demand that they work forty-eight hours a week, Mr. Gair, said: "Those men and all men like them are fighting a losing battle, and the sooner they come to realize it the better off this country will be. Increased production is the only salvation for employers and workers alike."

That the men in commercial printing lines are coming to see conditions in the light pictured by Mr. Gair is evident in reports indicating that local unions in various parts of the country, which called strikes a week ago to enforce the forty-four hour demand, were quick to patch up agreements. Between 4,000 and 5,000 men went out in Chicago while about 1,500 are still out in New York State, and none are out in other cities. The Employing Printers League of Chicago averted a general walkout by accepting the demand, though they say the matter of a wage cut is still to be considered. Early settlements are expected in many localities because of the lead taken by the unions in New York, Chicago, Indianapolis and other leading centers. The four major printing crafts in Chicago were among the first to come to terms. A wage reduction approximating $4.35 a week was accepted by the unions after differences, were placed before an arbitration board. The scale agreed upon applies to a week fixed at forty-eight hours.

With the strike of paper makers—called May 1 for some mills by the international unions when the latter refused to acceed to wage cuts—still in progress, reports from various centers indicate a disposition on the part of labor not directly involved to come to satisfactory understandings regarding downward revisions of wages. The Kimberly-Clark Company, Neenah, Wis., the Thilmany Pulp and Paper Company, Kaukauna, Wis., and the Appleton Coated Paper Company, Appleton, have put into effect wage reductions of from 15 to 20 per cent. In proposing the cuts to their employees the Kimberley-Clark Company presented figures to show that it was practically impossible to continue operating so long as the high wage scale remained in effect, inasmuch as the price of the company's product is being reduced.

Wage reductions of 20 per cent became effective May 1 in the plants of the Crown Williamette Paper Co. at Camas, Washington, and Oregon City, and in the plant of the Hawley Pulp and Paper Company at Oregon City. All skilled and unskilled labor is affected, and it is said to have accepted the cut without any demonstration. Until May 1, $4.32 had been paid for an eight hour day, the cut brings the daily wage to $3.46. It was said further reductions are contemplated if the wage schedules in Eastern plants go lower.

The unions involved in the international strike called against concerns that are parties to the general agreements which expired May 1, and May 11, were elated by an announcement stating that the Grand Lake Bag Company of Woodland, Me. had agreed to operate its plant at the present scale of wages for another year. Several of the smaller concerns in New York State are also said to have decided to continue the present scale. These include the Nuera Company at Hadley, N.Y., and the Schroon River Company at Warrensburg. Union officials also claim that the Great Northern Paper Company has renewed the present contract with their union employees. They quote Manager William A. Whitcomb of the Great Northern Company as follows: "We agreed with our men that living conditions have not changed sufficiently to warrant any reduction in wages or a change in the working conditions of the men, so we shall continue for the next year paying the same wages as we have paid during the past year."

A bill proposing control of forest devastation has been introduced in the United States Senate by Senator Arthur Capper of Kansas. The measure follows closely the program of the National Conservation Association of which Gifford Pinchot is president, and it has the indorsement of that organization. It places control over forest devastation with the secretary of agriculture and the forest service, working in conjunction with advisory boards from the lumber and wood using industries. It provides for decentralization of administration by throwing the execution of the act into the field, thus assuring a local and democratic control.

While most paper companies in Wisconsin have succeeded in cutting wages as much as 20 per cent without encountering serious opposition from their employees, the Northern Paper Mills, Green Bay, Wis., is having great difficulty in settling a strike begun some time ago by its workers when they refused to accept a reduction of 17 per cent. Outbreaks and riots have obstructed the efforts of the company to operate despite the strike, and the courts have been resorted to several times to enjoin and restrain picketers.

Congress has under consideration resolutions proposing the appointment of a commission to take up the pulpwood situation with Canada. The resolutions are exactly similar to the one drawn up at the last session of Congress by Senator Underwood, which was vetoed by President Wilson.

The bill providing for water power development in New York State under State control by private capital, was signed last week by Governor Miller. The measure creates a water power commission, consisting of several of the State's executive officials. This body is to investigate water power resources and sites and the cost of economically developing them. Licenses are to be issued for its development, and the rates and regulation of the companies are to be under the control of the State Public Service Commission.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, May 7. — A number of paper lines sagged to lower price levels during the past week. The price lists of bonds, books, writing papers and parchment papers all underwent a downward revision, the reduction representing in some cases from ten to fifteen per cent. Whether these further reductions will result in increased business remains to be seen. Hitherto the experience of most mills and jobbers has been that price reductions have not materially stimulated business, but it appears to be a settled policy to bring prices down by gradual steps to conform with the new conditions that prevail in the trade. Business, for the most part, continues dull although there are signs of a brightening up in some lines. Trade in paper fluctuates these days with a few days of fairly good business being alternated by small sales. Generally, the paper dealers are complaining of very dull times.

PULP.—Although the pulp market is down to a rather low level some of the mills report a slight picking up in trade. Most of the American mills are closed down, but when the settlement of the wage question across the line comes, and the mills resume operations, the Canadian pulp manufacturers look for good business. Stocks in the hands of the consuming mills are gradually becoming depleted. The representative of one of the big mills told the Pulp and Paper Magazine this week that, based on normal times, the present supply of pulp on hand at the mills would last from eight to ten days. According to the gentleman quoted so many of the mills across the line have been down that stocks have not accumulated to as great an extent as a good many people imagined. "The real trouble in the pulp and paper industry, as well as other industries," he said, "is that the producing end of a lot of industries made enormous cuts to meet the altered conditions but these have not yet been passed on to the consumer. He is still paying an exorbitant price when the cost of raw materials is considered. While this applies to commodities as a whole it is particularly applicable to the paper industry."

While comparatively few transactions in the pulp trade are taking place, groundwood still hovers around the $40 mark. Bleached sulphite is quoted at from 6c to 6½c and high grade easy bleaching is bringing from 4½c to 4¾c per pound.

BOOK AND BOND PAPERS. — Radical reductions in prices of book papers and bonds went into effect last week and it is generally understood that the new prices represent rock bottom. In any event the new list is certain to prevail for some time to come if prices have not already reached the minimum. The somewhat extraordinary spread of prices during the present year is illustrated in the case of white sulphite bond, which, during the past five months has dropped from 23½ cents to 15 cents per pound. It is believed that the purpose of the present drastic cut by the manufacturer is to remove any doubt as to the future and permit of a restoration of confidence in the market, while it should also have the effect of off-setting price-cutting which has been all too prevalent in the jobbing trade of late. The present reductions represent over fifteen per cent from that list, in some cases. White sulphite bonds have been reduced from 18 cents to 15 cents per pound: tints from 19 cents to 16 cents and colored from 20½ cents to 17½ cents, f.o.b. mill, not packed. No. 1 rag is now quoted at 36 cents; No. 2 at 28 cents and No. 3 at 25½ cents. In book papers No. 1 M.F., is now selling at 12 cents; No. 2 at 11 cents and No. 3 at 10 cents, with half a cent added to these prices for S.C. book.

WRITING PAPERS. — Writing papers also have undergone a considerable reduction in price, representing about a ten per cent drop. Cheap grades of this line are now quoted at 13¼ cents ton lots at the mill and the better grade runs at 16½ cents.

WRAPPING PAPERS. — Orders for this line continue small in volume, although the trade is fluctuating somewhat with a slight tendency towards better business. On the whole, however, there has been little improvement and dealers are complaining of the lack of business. It is not thought in the trade that prices in the wrapping paper line have reached rock bottom and the recent reductions in the lists, it appears, have not stimulated trade to any extent.

PAPER BAGS. — The paper bag industry is undergoing a very quiet period and very little business is moving. It is estimated by one leading manufacturer that the consumption of paper bags has fallen off at least a third since the thriving times of the war period. This appears to be accounted for by the large decrease in the amount of money in circulation, due, in a measure to unemployment. During the war years, and for a short time after, merchants using paper bags turned over a lot of stuff, but with the return of the survivors from the overseas conflict hard times followed and there was a big drop in the amount of money available for purchases at the grocery and other shops. As a consequence there has been a big decrease in consumption in the paper bag industry and manufacturers do not look for improvement in business for some time to come. Prices have dropped three times since the beginning of the year, a ten per cent reduction coming into effect about three weeks ago. During the past six months prices have declined as much as twenty-five per cent and they do not appear to have touched rock bottom yet.

PAPER BOX INDUSTRY. — Trade in the paper box industry is quiet although some good-sized orders have been secured by some of the manufacturers. General complaint is heard that paper box users, despite the fact that prices are now lower than they have been in a long while, both in the finished boxes and boards, are delaying the placing of orders for their requirements which is placing the manufacturers under a heavy handicap. The orders for boxes that are coming in are for quick delivery and the box manufacturer cannot always get his board on short notice, with the result that many orders are delayed in delivery. With the present low price of chip and other boards which, of course, has sent boxes down, it would appear to be an opportune time for paper box users to anticipate their requirements and place their orders early.

PARCHMENT PAPER. — The Victoria Paper and Twine Company, who some time ago embarked on the manufacture of parchment paper report gradually in-

creasing business in this line. The demand is steadily growing and at the present time the mill is several weeks behind with their orders. A decline of about five per cent in prices went into effect during the past week. For instance 27-lb. parchment is now quoted at 27 cents and 30-lb. at 24½ cents with other grades in proportion.

NEW YORK MARKETS.

New York, May 7. — (Special Correspondence.) — The strike of newsprint and pulp mill workers which became effective early this week has a tendency to alter the market situation both in print and in several raw materials used by paper mills. While actual prices have not yet been disturbed to any material extent, the newsprint, wood pulp and old paper markets evince a decidedly firmer undertone, and there are numerous indications that if the strike lasts some broad fluctuations in an upward direction are likely to develop in prices.

It is but logical that the closing down of some of the largest producing mills in the country, and the outlook of other plants having to stop operations on May 11, would have a stiffening influence on the newsprint market. Inquiry from consuming quarters has picked up to a noticeable extent, and there have been orders placed here and there by publishers who have thought it wise to contract for an extra supply of paper so as to insure their requirements in the event the strikes continues for a lengthy period. Sellers of newsprint are distinctly more bullish in their views and are generally holding unsold stocks at firmer prices. About the lowest quoted on spot newsprint in rolls in the open market is 5.50 cents per pound, and most of the available supply is held at higher figure than this. Publishers are well aware that present stocks of newsprint are ample to fill their normal requirements for at least six or seven weeks, but the refusal of manufacturers affected by the strike to quote on paper and the stronger tone exhibited by the market prompt some of them to be more desirous of adding to their stocks.

Gradual improvement seems to be taking place in other branches of the paper market. Fine papers are looking up both in demand and price, and signs point to jobbers regaining confidence in the stability of values and commencing to increase their stocks. President George A. Galliver of the American Writing Paper Company issued a statement several days ago explaining to the public that the mills of his company were not involved in the newsprint and pulp mill operatives strike, and saying that business in writing papers is beginning to show considerable improvement. Mr. Galliver states that last week was the best of any so far this year for his company, and that in his estimation the slump in buying which began last Fall is now a thing of the past and that continued expansion of trade can be expected from now on.

Activity in box board has broadened during the past few days. It is true that most of the additional demand for boards has been of a speculative character — coming from boxmakers and others who apparently believe prices have reached bottom and who therefore are laying in supplies against future requirements — but the fact remains that mills are securing more orders and the market presents a much livelier complexion. A leading board dealer in New York reports that his concern has sold a greater quantity of chip and news board within the past fortnight than in the two preceding months. Moreover prices are beginning to reflect the increased movement of board, and are hardening. A majority of Eastern mills are refusing to sell plain chip board at $30 per ton f.o.b. their points and are insistent on $32.50 to $35., while filled news board is generally quoted at $35 to $37.50. Several producers are understood to be accepting a limited volume of orders from regular customers at slightly lower prices than these.

Book papers hold fairly steady in price at a basis of around 7 cents per pound on machine finished book, and demand, if anything, is on the rise. Tissue paper manufacturers are rather firm in their insistence on a price of 95 cents per ream on No. 1 white tissue, basis 20 x 30, and the same price on No. 2 white and No. 1 manila, 24 x 36. There is a moderate demand for tissues although many buyers are confining their purchases to supplies to be had from second hands at less than the figures quoted by mills.

No change is reported in wrapping papers. There is a fair trade current, despite consumers buying chiefly in retail quantities. A bullish factor in the wrapping paper industry is that should the strike of newsprint mill workers continue for any appreciable length of time the probabilities are a good many manila mills would turn their machines over to print paper, thus reducing the output of manila papers and making for enhancement in value of such of these papers as are held in stock.

GROUND WOOD. — The strike at newsprint and pulp mills apparently has had a stronger effect on the ground wood market than in any other direction. Demand has broadened considerably, and owners of pulp who, a few days ago, were anxiously seeking to liquidate stocks now are holding up with considerable firmness and are making little effort to negotiate sales. The reason for this is obvious. It is generally recognized that those mills involved in the strike are the largest producers of ground wood pulp and unbleached sulphite, and that the surplus which they manufacture constitutes the bulk of supply which covers the needs of the numerous smaller paper and board plants throughout the country which do not make pulp. With these supplies removed from the market, which would be the case, should the millls whose employes are gone on strike be compelled to remain closed very long, consumers who depend on such sources for their pulp would of necessity have to look in other quarters for ground wood and sulphite, thus leading to a large increase in spot demand. Pulp grinders in New York State are reported demanding around $35 a ton at shipping points for spruce ground wood, while some are said to be holding for higher figures. Purchases from Canadian mills have been reported at $30, and in some instances at less, but supplies at such prices are declared to be becoming light.

CHEMICAL PULP. — A decidedly firmer price tone marks unbleached sulphite, news grade especially, and although other grades of chemical wood pulp have not been perceptibly affected by the strike situation developed this week, the general market position seems to be improved. Offers of $60 and $65 a ton to domestic producers for news grade sulphite have been flatly turned down in quite a number of cases, and it is authoritatively reported that most manufacturers are asking around $75 for this description of pulp f.o.b. producing plants. The same probabilities in the ground wood market, as outlined above,



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INQUIRIES SOLICITED :

apply to unbleached sulphite, and it is these reasons that make for a stronger condition in this end of the chemical pulp trade.

Several of the leading domestic and Canadian producers for news grade sulphite are quoting 6.50 cents a pound at their plants for their product, and are said to be refusing orders at lower prices. On the other hand, some domestic mills are offering bleached sulphite at almost a cent per pound below this figure. The pulp involved doubtless is not of as fine quality as the higher-priced pulp, but the fact remains that bleached sulphite is available at sharp concessions. There is little important activity in kraft pulp, sales being of an occasional order and seldom involving large tonnage. Importations of pulp from Europe at New York recently have been practically nil, and there is little stirring in this branch of the trade.

RAGS. — Demand for papermaking rags continues dull. The inflow of rags from collection centres and the gradual accumulation of stock in dealers' establishments, make for an easy price tone. White shirt cuttings of No. 1 quality are reported to have sold at less than 10 cents a pound at shipping points, while No. 1 washables are reported available at 5 cents, fancy shirt cuttings at 6.75 cents, old No. 1 repacked whites at 6 cents and No. 1 miscellaneous packing at 4.50 cents, and repacked thirds and blues at 2 cents. Roofing rags are seldom bringing more than 65 cents per hundred pounds at dealers' points for No. 2 satinets.

PAPER STOCK. — Expectations of consuming mills being forced into the old paper market for increased quantities of waste paper as a result of the closing down of pulp mills because of the strike make for a firmer tone in the paper stock market than has been evident in a long time. Buying interest in white news cuttings is much more to the point, this being one of the leading descriptions of old paper substituted for ground wood, but prices still range around 1.35 cents a pound at shipping points. No. 1 mixed paper is moving in larger volume but at unchanged prices, board mills having as yet no difficulty in covering their wants at 25 to 30 cents per hundred pounds. Book stock is in fair call, with sales of No. 1 magazines reported at 80 to 85 cents f.o.b. New York, and old kraft paper is meeting with a moderate sale at about 1.50 cents for No. 1 packing. Shavings are quotably unchanged.

OLD ROPE AND BAGGING. — A steady demand prevails for old manila rope and car lot quantities are readily fetching around 4 cents per pound at shipping points in sales to mills. A sustaining factor is that stocks of rope in dealers' hands give every sign of being unusually light, while arrivals of rope from foreign sources are infrequent and of rather small volume. Old bagging is neglected by consumers and prices are strictly nominal, there being so little business passing that no established value basis exists.

PRICES ON GENERAL CHEMICALS.

Current Wholesale Prices in New York Market, Week of May 4th, 1921.

		Carlots	Less Carlots
ACID Acetic, 56%	100 lbs	4.00 - 4.25	4.50 - 5.50
ACID Glacial, 99½ % carboys	100 lbs.	9.50 - 9.75	10.00 -10.50
ALUMINUM Sulphate, commercial	lb.	.02¼ - .02½	.02¾ - .03
ALUMINUM Sulphate, iron free	lb.	.03¼ - .03½	.03¾ - .04¼
BARIUM Sulphate (precip.) (blanc fixe)	lb.	.04½ - .05	.05½ - .06
CALCIUM hypochlorite (bleaching powder)	100 lbs.	2.25 - 2.40	2.50 - 2.75
CHLORINE, gas, liquid-cylinders (100 lbs.)	lb.	.08 - .09	.09½ - .10
GLYCERINE C.P. (drums extra)	lb.	... - ...	.17 - .17½
LITHARGE	lb.	.08¾ - .09	.09½ - .10
POTASSIUM Bichromate	lb.	.11 1-3 .11¾	.12 - .12½
SALT Cake	ton	... - ...	33.00 -35.00
SODA Ash, light	100 lbs.	2.00 - 2.10	2.20 - 2.40
Soda Ash, dense	100 lbs.	2.30 - 2.35	2.40 - 2.60
SODIUM Borate (borax)	lb.	.06½ - .06¾	.07 - .07¼
SODIUM Carbonate (sal soda)	100 lbs.	1.90 - 2.00	2.25 - 2.50
SODIUM hydroxide (caustic soda)	100 lbs.	3.65 - 3.75	3.80 - 4.00
SODIUM Prussiate, yellow	lb.	.11½ - .11¾	.12 - .12½
SULPHUR, crude	ton	20.00 -22.00	... - ...
SULPHUR Dioxide, liquid, cylinders extra	lb.	.08 - .08½	.09 - .10

New York Chemical Market has not developed very actively. Buyers are still holding themselves in readiness to take advantage of any recession.

The demand for soda ash, both light and dense, is fair, the spot market having been practically depleted.

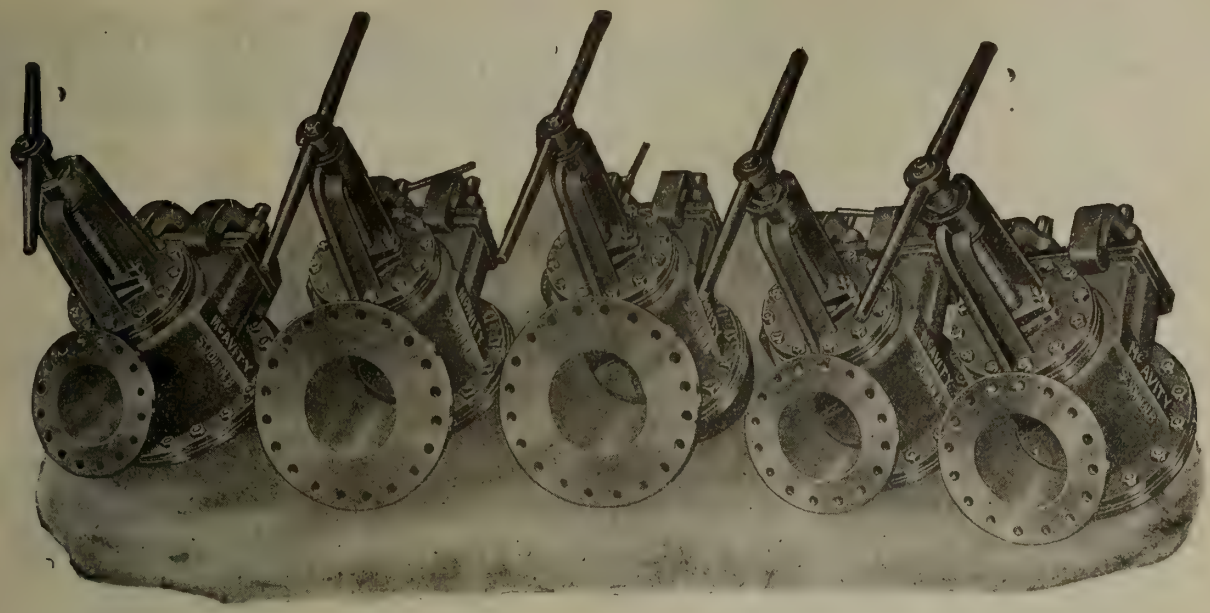
Holders of large stocks of Bleaching Powder tend to cut prices to a certain extent, and a price of $2.10 has been heard of at works, though it is hard to get authoritative information of prices under $2.25.

The Alum market is steady.

Scandinavian American Trading Co.

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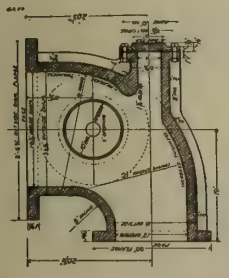




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News From Our Advertisers

SANDY HILL I. & B. ELECT OFFICERS.

At the annual meeting of The Sandy Hill Iron & Brass Works, held at Hudson Falls, New York, May 2nd. 1921, the following directors were elected for the ensuing year:

A. J. Kennedy, R. C. Tefft, J., C. W. Kellogg, H. L. Broughton, J. M. Ferris.

Following the stockholders meeting the directors met and elected the following officers:—

A. J. Kennedy, President; R. C. Tefft, Jr. Vice President; J. M. Ferris, Secretary-Treasurer.

NEW ADDRESS OF JAMES D. LACEY & CO.

After May 5 the New York office of James D. Lacey & Co., will occupy larger space in the new Borden Building, where facilities are available for our specialized service as Timber Land Factors, which has been rendered for over forty years.

The location is just north of Forty-second Street, corner of Forty-fifth in the heart of the new "uptown," on the 23rd floor, room 2306, but 350 Madison Avenue is sufficient address for mail.

THE HUDSON TRADING COMPANY MOVES.

The Trade will be interested to learn of the removal of the Hudson Trading Company, Paper and Pulp Merchants, on May 1st, 1921, to the seventh floor of the new building, 300 Madison Avenue, corner of 41st Street, New York, N. Y. The Company has taken the entire seventh floor in the new building which will afford three times the space had in the old offices.

The present change marks a new milestone in the successful progress of this concern and records another chapter in its long history. Established in the year 1886 by its President, Mr. M. Gottesman, the Hudson Trading Company is now counted as one of the most important factors in the Pulp and Paper Industry.

The Hudson Trading Company maintains offices and branches in all parts of the world and has established a truly international organization, devoted solely to the Paper and Pulp Trade.

One of the conveniences that they have instituted in their new offices is a special room reserved for the use of out-of-town mill men who visit New York.

Officers of the Company are, President M. Gottesman; Vice-Presidents—Saul Gottesman and Benjamin Gottesman; Secretary—Herman Gottesman.

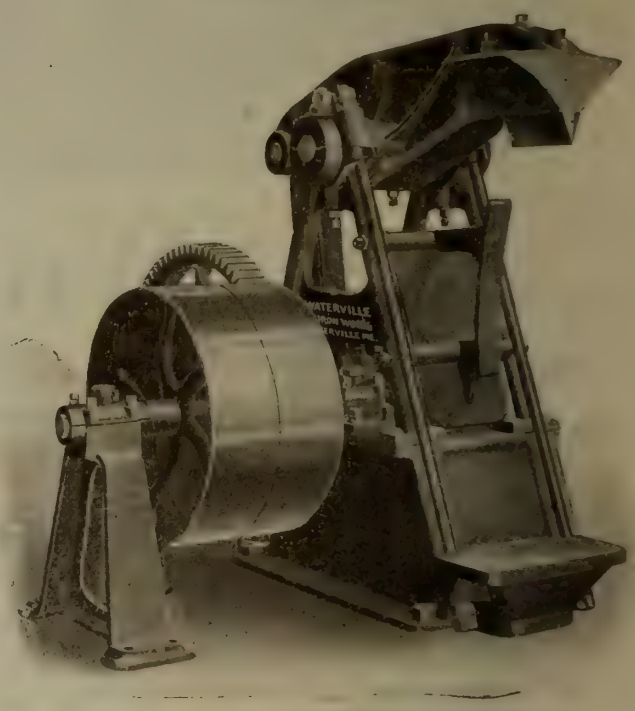
Escher Wyss & Company of Montreal, have recently been awarded the contract for 2 six-million Imperial gallon pumps and motors, for the Peterborough Filtration Plant. The motors and switchboard are to be supplied by the Canadian General Electric Company Limited.

Price & Pierce, Ltd., prominent New York paper and pulp dealers have moved on May 12th to a new suite of offices in the National City Building, 17 East 42nd St., corner of Madison Avenue, directly opposite their old location, which was at 30 East 42nd St.

Charles James Bowell, President and Manager of The Intelligencer Printing & Publishing House, Limited, passed away this morning at his home, 161 Albert street, Belleville, Ont., after an illness of some duration.

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Steel Counter-Shaft with heavy fly wheel attached. Weight 4400 lbs. Speed 180 R. P. M.

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. **GARDENVALE, P. Que., May 19th 1921.** **No. 20**

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Published every Thursday by the Industrial and Educational Publishing Company, Limited. Garden City Press. Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office. 1402-3 C.P.R. Building. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building. Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

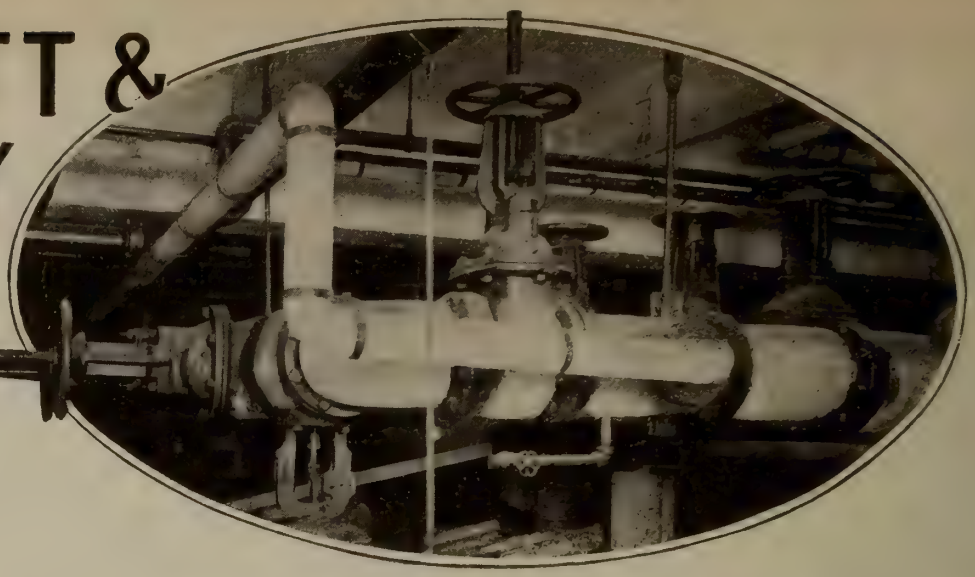
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Changes of advertisements should be in the Publishers' hands ten days before the date of issue.

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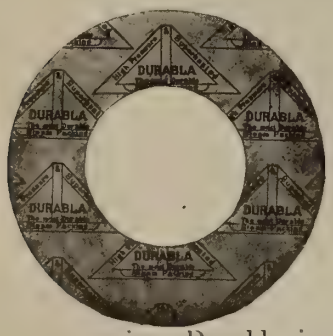
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EDITORIAL

THE 8 CENT LIMIT STILL HOLDS.

There is an interesting editorial in large type on page 40 of the "Paper Mill and Wood Pulp News" for May 14th on the subject of the 8 cent limit. Unfortunately, the comment on this subject is based either on misinformation or intentionally misrepresents the situation. In either case the large number of readers of the Paper Mill will be misled by this article.

The statement is made that on September 8th 1916, the Congress passed a law which permitted printing paper valued at not more than 5c to be imported into the United States free of duty. This raised the level by 100 per cent. of the previous figure. On April 17th 1920, this limit was again raised to 8c per pound. The Paper Mill states that this bill, which was signed by President Wilson on April 23rd 1920, was for the period of one year only and that consequently the period of enforcement expired on April 22nd last. On reading this bill and obtaining telegraphic confirmation on same from the United States, we wish to make it distinctly understood that the bill did not expire last month and does not expire until April 22nd 1922. It is commonly understood that the truth never catches a rumor but we trust this correction of the mis-statement of our contemporary will at least abbreviate the period of uncertainty and possible worry that may have been caused some of our readers.

Having made this unfortunate mis-statement, the Paper Mill goes on to argue over an import duty on all newsprint valued at more than 2½c. per pound, which of course, means all newsprint. The principal point brought out is that free paper puts the American manufacturer at a decided disadvantage in competition with the German paper maker who is subsidized by his government at the rate of a bonus of 500 marks per ton of newsprint export, and that the German manufacturer obtains his wood from public lands at cost of $7.20 per cord. This subsidy figures out about $10 per ton at the present rate of exchange and is about 100 per cent. of the present value of newsprint in New York. Putting a duty on the price of imported paper would simply make the American publisher pay that much more for his supplementary supply, it being well known that the American newsprint industry cannot begin to supply the normal demand for printing paper in the United States. It is also well known that the price of newsprint in the United States is made on the basis of the cost of production in American mills and is in no sense controlled, and probably not even influenced, by the cost of production elsewhere. It should be stated further, that the opinion expressed by those who have used German newsprint is that it cannot compete in quality with the American or Canadian product, so competition from this source is not to be feared, inasmuch as those who have used the German product are not particularly anxious to repeat the experience.

In any case it will be seen that an import duty on newsprint, no matter what the price limit, will simply make the American publisher pay that much more for the portion of his paper which must be imported. At any rate it should be remembered that the present law will continue in operation and in force until April 22nd 1922. In the meantime, a number of things may happen but one of these things is not likely to be a law which will require the American newspaper publisher to pay an import duty on newsprint.

THE COST OF CARELESSNESS.

The reports of the President and of the Safety Engineer for the Ontario Paper Makers' Safety Association, which appeared in the Pulp and Paper Magazine for May 5th, contain a statement the significance of which is just beginning to make an impression on the editor's consciousness. We refer to the amendment which is being added to the Ontario Workmen's Compensation Act increasing the scale of compensation from 55 per cent to 66 2-3 per cent of the workman's earnings with a corresponding increase in pension awards and the intimation that even further increases may be made in the near future.

Coupled with this announcement, which must indeed have startled the manufacturers of Ontario, comes the statement in the report that the cost of compensation in 1919 was $251,057 as against $134,397 in 1918. What may be expected for 1920 is indicated by the report that there was an increase of 40·98 per cent in non-fatal accidents and an increase of 112.5 p.c. in fatal accidents during 1920 as compared with 1919. During this time there was an increase of 10·23 per cent in the number of full year workers. Summing this up we can see that, on the average, each full day worker in 1919 lost 1·99 full days, while in 1920 this loss was 3.22 days. The total time lost in days work during 1920 reached the astounding total of 25,453.

Surely this condition is a very serious one. The prevention of accidents has been engaging the best thought of the managers of pulp and paper mills in Ontario for many years and for a number of years they have formed a special organization so that the experience, thought and advice of all, under the direction of a capable engineer, are available for the benefit of the

whole industry in that province. Moving pictures have been shown, safety rallies have been held, contests have been inaugurated, to arouse not merely the momentary interest of the manager and the workmen but to establish a basis for continued attention and co-operation in eliminating, or at least postponing, the day when a workman can no longer perform his accustomed task. In spite of all these efforts, and in many mills they have been accompanied by conscientions attempts to co-operate on the part of the workmen who have formed committees for the purpose, we find the accident rate increasing and what is more unfortunate, we find the severity rate also increasing. This condition may not be confined to, nor typical of, the pulp and paper industry, but the pulp and paper industry is the business with which the life of nearly every reader of the Pulp and Paper Magazine is wrapped up. It is the business of each one of us to do our share in removing this scourge.

With evidence on every hand of the care and attention which managements through safety committees, safety engineers, and guards and warnings conspicuous in every plant, there is no question whatever in our mind but that the heart of the difficulty is in the mind of the workman. By this we mean that there is in the average workman's mind, a cavity just about the size of 3¼ days honest work which would be filled with productive effort and full earning power if it were inhabited by an average of one more thought per day. There is no doubt whatever but that this curse of carelessness and thoughtlessness is the cause that is costing the industry what is fast becoming an unbearable burden and is costing the workman and his family a vast amount of unnecessary pain and suffering, even want of daily necessities.

The introduction of the Workmen's Compensation Act in Ontario and similar legislation in other provinces is certainly an advance over the old system whereby the workman was required to bear too great a share of the misfortune of an accident and particularly so where the employer was obviously to blame through lack of proper safeguards. The employer of the present day, however, recognizes the advantage both from an economic and humanitarian point of view in keeping his workmen physically and mentally at their highest efficiency; consequently there are few unguarded points in the paper mill and there are no sources of accident which cannot be easily avoided at the cost of a thought on the part of the workman. Since the editor learned that while calenders "have no teeth their gums are hard," feeding fingers and improved doctors have done away, at least on one familiar old Fourdrinier, with the necessity for the back tender to get very close to this source of danger. Other parts of the mill have been likewise protected but there is only one thing that will prevent a man from deliberately walking through an open main drive belt, or pulling out sticks from the **bottom** of a block pile, or lifting an elevator gate to see which way the elevator is moving, or standing on a gear guard to oil a machine, or throwing in a switch while men are working on the line, or leaving obstructions in a passage way, or throwing material out of windows without first looking below, or doing about fifteen thousand other simple acts of carelessness which occur everyday—and that single preventive is a **thought**. If the average workman is not willing to give this contribution to the industry which employs him when the lack of such thought is costing the industry in a single province more than a quarter of a million dollars a year, then it seems to us that he had better be invited to find employment in the middle of an open field where if he can find a chance to do injury it will only be himself that will suffer.

Workmen's compensation is almost putting a premium on carelessness and the burden on industry has reached the limit. **The careless man must go.**

COBWEBS.

A reader wants to know if that item in our last issue about asking the minister to preach a monthly Safety First sermon refers to protection from fire.

Mr. B. F. Avery, of the Spanish River Mills, is the proud husband, (pictures in the News prove it!) of Miss Mary Stone. Wonder why they chose the Secretary of Industrial Relations for best man—By the way, he and the maid of honor make a pretty good picture.

Apropos of the above comment on accidents, The Broke Hustler says that five departments at Iroquois Falls have been operated four months without an accident. They are: Sulphite, Mixing Room, Finishing Room, Saw Mill, and Fire Protection and Sanitary, involving 126 workmen. We lift our hat, gentlemen.

Financial experts see, in the recent recovery of foreign exchanges, reason for anticipating better trade conditions.

The editor had the pleasure last week of meeting Mr. Paul Jouanneau of Vaissier et Caron, papermakers of Vendome, France. He is visiting some typical sulphite, groundwood and paper mills in Canada and the United States, with the particular object of studying at first hand the manufacture of some of the pulp his company will use. Madame Jouanneau accompanies her husband.

We were glad to learn that the French mills are recovering, and that imports from Germany are decreasing because the home mills can now sell paper at about half the price of a year ago.

The Relation of the Moisture Content of Wood to its Decay, with Special Reference to the Spraying of Log Piles

By WALTER H. SNELL,

Assistant Professor of Botany, Brown University and formerly Forest Pathologist, U. S. Department of Agriculture.

The prevention of fire in piles of pulp wood by means of artificial fog has been advocated recently by F. J. Hoxie [1]. The idea is of course to keep the wood wet enough to prevent its catching fire. But while the log piles are being protected from fire, a question naturally arises:—is this wetting of the logs going to bring conditions favorable to decay and thus cause as much loss as, if not more than, what is now caused by fire?

The growth of the wood-destroying fungi in wood is dependent upon a certain amount of moisture and of oxygen, granting that these fungi have a favorable food to grow upon and a favorable temperature. The amounts of moisture and air within the wood are directly related one to the other. Wood is made up of cells which are hollow, the hollow portions of lumina

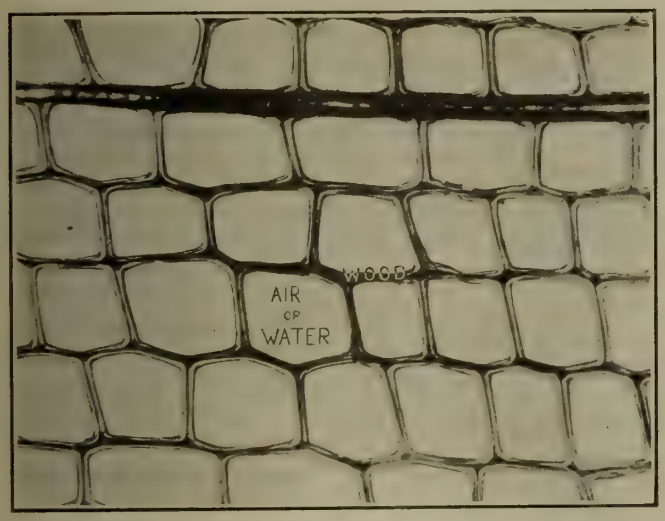


Figure 1. Cross section of spruce, a light wood, showing relatively small amount of wood substance and large lumina, which may contain air or water. x 300. Photograph by F. J. Hoxie.

being large or small according to the density of the wood. Hence, in a light wood like spruce (figure 1) we find the walls thin and the empty spaces (the lumina) rather large. While in a hard pine (figure 2), the walls are thick and solid and the lumina correspondingly smaller. These lumina of the wood cells may contain either water or air, and it is clear that those portions not filled with water will have air in them and vice versa. If water is forced into the wood, air will be forced out and if water is withdrawn from the wood, air will enter.

As already mentioned, the growth of fungi within wood is dependent upon a proper amount of air and moisture—which means a proper balance between the air and moisture supply within the wood. If too little moisture is present, fungi cannot grow for the lack of it. If large percentages of water are present in the wood, fungi cannot grow, not because there is too much water, but because there is too little air. In other words, a fungus will drown under water, where it cannot get air, just as a man will. Drowning of plants and animals is essentially asphyxiation. Between the two limits where there is too little moisture to support fungus growth and where there is too little air because of its displacement by water, there is a wide zone where growth is possible, and a certain peak in the curve where conditions or air and moisture are at the optimum. It is important to know just what relation exists between the moisture and air content of pulp logs which are constantly sprayed as mentioned above and the three cardinal points (minimum, optimum and maximum points of growth) in the air-moisture curve of wood-destroying fungi.

The purpose of this article is to reveal what is thus far known regarding the air and moisture relations of fungi which decay wood. The data are taken from a paper published in Germany by Muench [2] and from preliminary experiments made by the writer. The German writer performed an extended series of experiments upon the fungi which cause the sapstaining or bluestaining of sap lumber, and also upon several fungi which decay wood. In general he found that none of the fungi of either group could invade fresh (that is, green) sapwood, which contained 50% of water (equivalent to 143% of water calculated on the oven dry weight of the wood). As the wood was dried, however, it was found that the fungi invaded the wood more deeply and did more damage the drier the wood, up to a certain limit.

Table one shows the results of Muench's experiments upon the moisture relations of one of the sapstain fungi (**Ceratostomella coerulea**) in the sapwood of

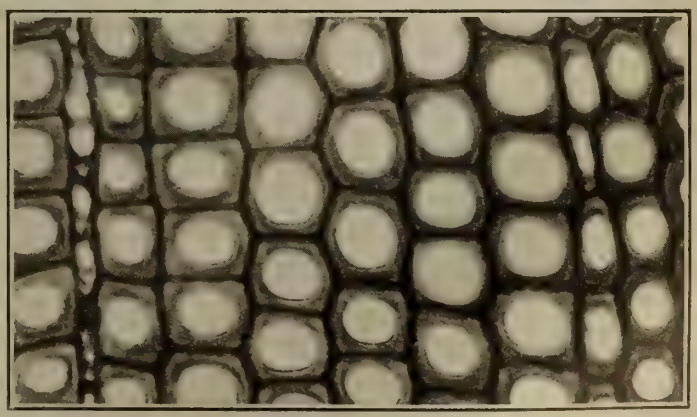


Figure2. Cross section of jack pine, a medium heavy wood, showing relatively large amount of wood substance in the thick walls and smaller amount of air and water space. Compare with spruce in figure 1. x 300 Photograph by F. J. Hoxie.

[1] F. J. Hoxie, Fire prevention in pulpwood by means of artificial fog. Pulp and Paper Magazine of Canada, Jan. 6 and 13, 1921.

[2] Muench, E. Untersuchungen ueber Immunitaet und Krankheitsempfaenglichkeit der Holzpflanzen in Naturwissenschaftliche Zeitschrift fuer Forst—und Landwirtschaft 7:54.

Scotch pine. In columns 2 and 3 the results are given on the basis of air volume and the volume of water **within** the cell cavities (exclusive of the water in the cell walls themselves) on the basis of 100 cubic centimeters of wood. In column 5 of the table, Muench's figures are translated into the engineers' terms of percentage of water determined upon the basis of the total weight of the wet log. Column 6 gives the figures in terms of water over and above the oven dry weight of the wood. It is seen from the bottom of column 5 that 23% of water allowed very little penetration (or staining) of the wood by the fungus, that from 25% up to 42% of water allowed the maximum amount of staining, and from there up to 54% there was a gradual decrease in fungus growth and none at all at 59%. Column 2 shows that for the most favorable growth of this fungus within wood, there must be a quantity of air equivalent to about half the volume of the block (42 to 59 cubic centimeters in 100). Muench did not give figures for the growth of the true wood-destroying fungi, but showed that in general the same figures given for the sapstain fungi held true for the wood destroyers. He did not, however, point out that these percentages hold only for woods of about the same density as those he used and that they do not apply to lighter or heavier woods.

Table 1.—Data obtained by Muench upon the relation of the growth of a sapstain fungus (Ceratostomella coerulea) to the moisture and air supply in Scotch Pine Sapwood.

Results as tabulated by Muench on basis of 100 ccm. of wood				Results shown as moisture % of total weight of wet wood	Results in terms of water above oven dry weight of wood
1	2	3	4	5	6
Block	Air in wood	Volume of free water above fiber saturation	Penetration and staining by fungus		
1	15 ccm	45 ccm	none	59%	143%
2	23 "	35 "	little	54%	119%
3	25 "	32 "		52%	111%
4	36 "	24 "		48%	92%
5	38 "	22 "		47%	88%
6	40 "	18 "		44%	78%
7	42 "	16 "	optimum	42%	74%
8	47 "	11 "	for	38%	62%
9	54 "	4 "	growth	31%	45%
10	55 "	5 "	of	31.6%	46%
11	59 "	—1 "	fungus	25%	33%
12	61 "	—3 "		23%	28%

In order to check up Muench's figures and to get more exact data for the latter class of fungi, the present writer started some experiments in the Department of Botany at Brown University upon the moisture relations of five of the fungi found decaying structural timbers in New England cotton mills [3]. The fungi are **Lenzites sepiaria, Lenzites trabea, Trametes serialis, Fomes roseus** and **Lentinus lepideus**. The first four of these are found quite commonly on pulp logs. Two woods of different densities were used in the tests —loblolly pine sap weighing 27.5 lbs. to the cubic foot and Sitka spruce weighing about 22 lbs. (specific gravities of .44 and .35 respectively). Only one series of tests has thus far been completed, but the results obtained are of value in the present discussion upon the spraying of pulpwood and the question of decay in the wet piles. Further experiments upon this relation between decay and the moisture content of wood, especially the relation of the density of the wood to the moisture-decay curve, are still in progress.

The results upon the loblolly pine sap are very closely in line with those of the German writer on Scotch pine. There was found to be very little decay when the amount of water was below the fiber saturation point (25% in terms of the oven dry weight of the wood), but with increase of moisture content the decay became more extended. The greatest amount of decay occurred between 33% and 42%. From 42% on, the amount decreased. At 50% there was a little decay and none at 60%.

Conditions were different with the spruce, a lighter wood. Penetration and decay by the fungi began a little below the fiber saturation point for this wood and increased in amount with higher percentages of moisture. The greatest amount was between 30% and 57%. There was no penetration by the mycelium and decay at 67%. It is seen that the latter values are higher for the pruce than for the sap pine. Obviously, the values representing the upper moisture limits for decay will vary inversely with the density of the wood.

With reference to the decay of pulpwood, however, the figures on Sitka spruce represent an extreme case, for this wood is lighter than any of the other pulpwoods. Table II shows that the Sitka spruce used weighed 22 lbs. to the cubic foot while poplar, balsam and red spruce weigh 26-27 lbs. or very near the density of the pine sap used. Hence, the figures on the relation of moisture content to decay of the loblolly pine sap will be applicable to the pulpwoods.

Table II.—Densities of a few common woods, including some woods used in making pulp.

	Density (lbs per cubic foot, oven dry.)	Specific gravity (weight and volume oven dry.)
White oak	44	.71
Sweet birch	43	.70
Sugar maple	41	.66
Longleaf pine	40	.64
Paper birch	38	.60
Pitch pine	34	.54
Loblolly pine sap*	28	.44
Cottonwood	27	.43
Balsam	26	.41
Red spruce	26	.41
Sitka spruce*	22	.35

* These two woods were the ones used in the tests quoted.

In a recent article, Sutermeister[4] reports that spray-

[3] A study of these fungi carried on by the writer at the Forest Products Laboratory at Madison, Wisconsin, is soon to appear as a Bulletin published by the United States Department of Agriculture.

[4] Sutermeister, E. Spraying wood for preservation and fire protection. Paper, pp. 21 and 30. Dec. 22 1920.

ing a pile of poplar logs for a short period resulted in the pulp bolts taking up water to the amount of 52% to 60%. The logs sprayed as he describes were covered with molds and slime molds, were nearly black in color and had the appearance of being badly decayed. Examination proved, however, that "the greater part of the wood was sound and very few logs could be found which were soft enough to allow a knife to be driven into them more than a quarter of an inch".

If spraying a pile of logs for a few months added 52% to 60% of water, continuous spraying over longer periods would probably increase the amount of water. The writer's experiments with five different fungi, four of which occur upon pulpwood, show that 60% of water in the logs will eliminate all danger of serious loss from decay. These results should enable pulp mill owners to proceed with confidence in the installation of a spray system such as advocated by Hoxie. A constant spray or "artificial fog" will keep the logs sufficiently wet to protect them from both fire and decay. Logs so wet will mold on the outside, but molds do no damage to wood beyond discoloring it superficially.

NEW BROMPTON BONDS TO YIELD 8.10 PER CENT.

Greenshields & Company, have issued their prospectus dealing with the public offering of $2,500,000 of Brompton Pulp & Paper Company, Limited, 8 per cent convertible 20-year mortgage bonds at 99 and interest. The issue is dated May 1, 1921, and is due May 1, 1941, interest payable semi-annually May 1 and November 1 at Montreal, Toronto, Halifax, Winnipeg and Vancouver. Coupon bonds of $1,000, $500 and $100 denominations are issued with privilege of registration as to principal only.

The bonds are callable in whole or in part on any interest date at the option of the company at 110 and accrued interest to May 1, 1931, provided holders be given 90 days' notice in which to exercise conversion privileges; after that date at 105 to May 1, 1936 thereafter at par.

The circular gives the total authorized bonded debt, including the present issue, at $6,707,000 of which $5,913,000 is issued. The 8 per cent cumulative preferred stock is fully issued, $2,000,000, and the 210,000 shares of no-par-value common stock authorized is issued to the extent of 140,000 shares, or $7,000,000. Bonds of the current issue are convertible at any time until May 1, 1931, at holders' option, into common stock on the basis of 20 shares of common for each $1,000 par value of bonds.

Full details of the Brompton plants and operations are given in the circular, but these have been reviewed in these columns a number of times and require no further comment at present.

BOARD APPROVES CANADIAN TIMBER.

The Department of Trade and Commerce has been informed that practical tests of British Columbia timbers—Douglas fir, B.C. spruce and western hemlock—by H. M. Board of Works, London, on behalf of the advisory committee on timbers of the Imperial Institute, have proved quite satisfactory and that as a result these woods will be included in the official timber specifications of that department as alternatives to European joinery timbers.

TECHNICAL SECTION SUMMER MEETING.

The time for the Summer Meeting of the Technical Section is approaching and the Executive Council have decided to hold it in the St. Maurice Valley. Those who accompanied the Technical Section four years ago will remember a very pleasant and instructive trip in this same district and with the developments which have taken place since that time, no member can afford to be absent.

The railroad authorities advise it will be possible for the Section to travel using the regular trains, and special sleepers will be retained for use at the different mill points. This arrangement is made on account of the difficulty of accommodation at points such as Three Rivers and Grand 'Mere.

There will be no papers on this trip. It will be an outdoor meeting and the hope is to see the St. Maurice plant, the vast undertakings which have been consummated at the Laurentide mills, and the magical changes which have been made at the Belgo Company.

The party will leave Montreal at 10.30 (Standard time), Windsor Station on the evening of *Tuesday, June* 14th, and will be back on the night of Friday, the 17th, in time for out of town members to make connections for Toronto and elsewhere.

The cost of the trip exclusive of meals will be $20 per person. This will include train fare and the use of sleeper for the period of the trip. Everybody cannot have a lower berth but first come will be first served.

Members should return postcards (sent out this week) as quickly as possible so that this secretary may make proper arrangements.

PROGRESS OF NATIONAL FORESTRY PROGRAM COMMITTEE.

Dr. H. P. Baker, Secretary of the American Paper & Pulp Association is being scheduled for a series of talks to Rotary Clubs and similar organizations in Ohio and Michigan during the early part of June, when he will discuss the Snell bill from the standpoint of the needs of the paper industry for a continuous supply of raw material.

Valuable ammunition showing the need of reforestation is available through the announcement by the New York State College of Forestry at Syracuse that its wood using survey of New York State, made in cooperation with the United States Forest Service, shows a 30 per cent decrease of the number of wood using concerns in the state since 1912, as a result of the disappearance of the forests which furnished their raw material. This survey is indicative of what would be disclosed by survey of other states.

The Pittsburgh Flood Commission has, through Maj. W. M. Jacoby, published a strong appeal to the Pennsylvania Legislature to enable the Federal government to secure land for a national forest to protect the headquarters and avert floods in the Ohio River.

After a short period of full time service for the National Forestry Program Committee, the secretary, W. B. Bullock of this committee, has been made head of a new department in the American Paper and Pulp Association, which was from the start a leader in the campaign for a national forest policy. Because of the interest of the paper industry in forestry, and of the secretary's own interest in the problem, he will be allowed by the association to continue his work for the national committee without salary, but as a "labor of love."

PRESERVATION OF CANADIAN PULP AND PAPER INDUSTRY.

Editor, Pulp and Paper Magazine.

I have recently read remarks by an American Paper Manufacturer, who is, quite naturally, selfishly interested, regarding the proposed Canadian embargo against the export from Canada of pulpwood for the United States Mills. I note that the advocacy of such an embargo by Canada is described as "propaganda of men striving to serve personal ends," and from "selfish interests." But it seems to me that the selfishness is entirely on the other side, when the American Mills want to deprive the Canadian pulp and paper manufacturer of his raw material.

If wood were being shipped from the United States to supply the Canadian Mills how long do you think it would be before some action would be taken along these same lines?

Canada is in a much worse plight so far as her available supply of standing timber is concerned than is the United States. So far as my own personal ends are concerned, my mills in Canada have the largest supply of standing wood, based on their capacity, of any pulp mills in the world, all of which land is owned in fee, with the wood now exportable to the United States. Consequently, I cannot be accused of selfish interests in supporting an embargo or export tax on pulpwood.

I am perfectly willing to acknowledge that the situation with regard to a supply of raw material for the mills on both sides of the line is critical, and, as a matter of fact, sulphite pulp, at least, should even now be manufactured out of some annual crop instead of trees, even though the quality would be inferior, and the cost much greater. We need what standing wood supply now remains for the building of homes and uses for which there is no substitute for wood.

I note it is stated that Alaska can furnish perpetually one third of the print paper consumption in the United States, but when we consider that paper uses only about three per cent. of the total amount of wood consumed anually in the United States, one-third of this would be merely one per cent. of our total consumption, so we might as well forget Alaska. Furthermore, as a matter of fact, when Alaskan wood is used to any extent it will not be reserved for paper alone but will be used for all other purposes for which wood is required. And, when you consider that the entire supply in the Alaska National Forest would last the United States for all purposes only a matter of about one year, it will be readily seen that we are only raising a false hope in counting upon Alaska for a future paper supply.

Some idea of the enormous consumption of wood and timber in the United States can be gained from the fact that if the entire supply were drawn from Canada alone, the total available Canadian supply would last the United States only about six years.

The present temporary surplus of pulpwood and lumber was simply brought about by the high prices of 1920, which enabled the lumbermen to operate in the remote sections that contain our present remaining supply. As soon as business returns to normal, this apparent surplus will very soon vanish and will not be replaced until prices become sufficiently high so that the lumberman can again pay for the long hauls. In proof of this assertion, lumber is being sold at the present time at an actual loss of $15 to $20 per thousand feet, and pulpwood in about the same proportion.

This shortage of standing timber is world-wide, so we cannot look to other countries for supplies. As soon as business resumes anything like normal proportions there will be a sad awakening for our pulp and paper mills in so far as their supply of raw material is concerned; and that is why I say these mills should begin even now to use some annual crop as a substitute, at least for their sulphite pulp.

When such authorities as Senator W. C. Edwards of Ottawa, one of the best posted lumbermen of Canada, state that the standing supply in Eastern Canada will be exhausted in about twelve years, and R. W. Hibberson of the well-known timber cruising firm of Hibberson Brothers of Victoria, British Columbia, advises us that even British Columbia will be facing a timber famine within fifteen years, surely the time has arrived for some immediate action towards the retaining of our remaining supply for our home industries.

FRANK J. D. BARNJUM.

Annapolis Royal, N. S., May 11, 1921.

TRADE INQUIRIES FROM JAPAN.

Mr. A. E. Bryan, Trade Commissioner in Yokohama, Japan, has transmitted the following trade inquiries from that country to the Dominion Department of trade and Commerce.

2963. *Wood-pulp.*—An important organization in Southern Japan wish to be put in touch with Canadian mills interested in the export of sulphite pulp to Japan. Samples and prices are requested at once.

2964. *Wood-pulp.*—An old-established British firm in Kobe wish to receive samples and prices of Canadian bleached pulp. They are of the opinion that they could submit good business, providing that price and quality of pulp are satisfactory.

2965. *Pulp and paper.*—An American firm which has been doing business in Japan for several years in Osaka and Kobe are interested in Canadian pulp and paper for future business, and would be glad to receive samples and prices from Canadian mills. They state that business is a little slack at the present time, but if samples and prices were to be had they would be able to jump in and get business at the opportune moment.

2966. *Paper.*—An import and export concern with branches in all the important cities in Japan are anxious to get in touch with Canadian manufacturers of high-class writing paper, bonds, ledger papers, etc. Samples and full particulars should be sent at once.

2967. *Wood-pulp.*—A Japanese concern of good standing would like to receive samples and prices of Canadian bleached and unbleached pulp. They intimate that they are in a position to get good business, and would like to get in touch with some Canadian mill who could make good deliveries and who would be willing to form a permanent connection.

WORK MAY BE RESUMED AT KAPUSKASING.

According to reports from Cobalt, it is probable that the work on the construction of the mill and dam of the Spruce Falls Company at Kapuskasing, which has been suspended, will be resumed at an early date. There are 75,000 cords of wood in the river for the company. It is also stated here that plans are being made for the erection of a small pulp mill on the Frederickhouse River, at Connaught, to handle the 25,000 cords of wood there, and that this will be in operation this summer.

The Forest Products Laboratories of Canada

By A. R. R. JONES.

The work done by the Forest Products Laboratories of Canada deserves to be far more widely and generally known than it is. It is work of the highest importance by reason not only of its present intrinsic usefulness but also of its potentialities of future development. The organization is under the Forestry Branch of the Department of the Interior. It is located at 700 University Street, Montreal. The buildings which are in the grounds of McGill University, are occupied free. These buildings include the laboratories building, which houses the paper machine, the pulp and paper division chemical laboratory, the digester house, and carpenter shop. In addition to these, the Forest Products laboratories share with McGill its strength-of-material testing laboratory, in which, in fact, it owns certain machinery, while it also uses other machinery which is owned by McGill.

The total staff of the Forest Products Laboratories, exclusively devoted to research and experimental work, numbers about 18. A good deal of misconception, perhaps, prevails as to the true function of such an institution. The right view is that its proper function is scientific and industrial research in connection with woods and with every product manufactured or derived therefrom by mechanical or chemical processes. It is not generally known that a vigorous reorganization of the laboratories has been going on during the last seven months, in which time seven technical men have been added to the staff, while there are several positions still to be filled. Mr. W. Kynoch is the superintendent of the institution, the work of which is divided into four divisions of research and technical service.

First, there is the division of Pulp and Paper. At the present moment, the post of head of this division is vacant. The main lines of research, in this division, as to the work in which, as is naturally appropriate in a publication of this kind, something will be said in some detail, a little later on, comprise the utilization of waste sulphite liquor; the manufacture of blotting paper; the chipping, drying and baling of pulpwood for shipment; the chemistry of Canadian woods in relation to pulp manufacture, the relation of relative humidity and temperature to the moisture content of woods (this work is transacted in co-operation with the division of Timber Physics); the beating of pulp, that is to say, the reduction of this operation to a scientific process; the sulphite process, namely the penetration of cooking liquor in relation to moisture content of chips, etc.; the efficiency of newsprint splice (this work is done in co-operation with the division of Timber Tests).

Secondly, there is the division of Timber Physics. In this division, of which Mr. J. D. Hale is the head, the research is concerned with the physical properties of timber, starting with the anatomy of timber, which is the basis of the whole thing. The main lines of research in this division include fibre length studies on Canadian woods—25,000 measurements have been made—the methods of reducing the hygroscopicity of woods, the preparation of reference collection of microscopic slides of Canadian and other woods and studies of the anatomy of such woods; fungus bed tests of the resistance of Canadian timber to wood-destroying fungi; the decay of structural timber in buildings and its prevention; the decay of stored pulpwood and deterioration of stored pulp and their prevention; the relation of the relative humidity and temperature to the moisture content of woods—this last-mentioned work is carried out ,as mentioned above, in co-operation with the division of pulp and paper.

Thirdly, there is the division of Timber Tests, in which the research work is concerned with the mechanical properties of timber. Mr. C. J. Chaplin is the head of this division, the main lines of research work in which include the strength functions and certain related properties of Canadian woods—twenty-two species have been tested to date, involving many thousands of determinations—; the strength functions of Nova Scotia mine timbers, including studies and tests on the seasoning of mine timbers (six species); British Guiana woods as substituted for black walnut for rifle stocks in relation to their strength functions and other properties; the efficiency of newsprint splices—this last-named work is carried on, as mentioned above, in co-operation with the division of pulp and paper. The mechanical tests made are static bending, impact bending, compressed parallel, compressed perpendicular, hardness, shear, cleavage and tension tests. The physical tests made are shrinkage, moisture determination and structural characteristics tests.

Finally, there is the division of Wood Preservation, of which Mr. J. A. Coderre is the head. Here the main lines of work, which is concerned with research into the preservative treatment of timber by impregnation with chemicals, consist of the creosote treatment of Jack Pine and eastern hemlock railway cross-ties, with service test in the C.P.R. tracks; seasoning study on Jack Pine and eastern hemlock for railway cross-ties; field survey of railway cross-ties in Canada; the preservative treatment of Russian poplar for fence posts in the Prairie provinces; Canadian red pine for treated wood-paving blocks; seasoning study on birch, beech and maple for railway cross-ties; creosote treatment of birch, beech and maple for railway cross-ties.

Further important extra divisional miscellaneous investigations are carried on. These include investigations into the following: Substitutes for acetone as a solvent in the manufacture of cordite; potash from wood ashes; Canadian wood oils for ore flotation; and the utilization of decayed aspen.

Mention should be made of the excellent reference library which may be described as the very heart of the institution. It is a technical reference library, dealing with the technology of wood and forest products. It represents the result of seven years' discriminating collection on the part of the technical staff. There is certainly nothing like it elsewhere in Canada. It is particularly strong in information connected with the Pulp and Paper division. All periodicals of any value are taken, and this, in conjunction with the excellence of its technical works of reference, renders the institution in a position to furnish valuable information on current pulp and paper problems. It is probable that the completeness of this library's equipment is not as widely realized as it should be or its assistance would be more largely sought than appears to be the case.

The institution, since its inception in the fall of 1914, has published about 75 technical articles in the form of

government bulletins and articles in technical journals. These articles are written exclusively by members of its technical staff.

The condition of the present buildings, in which the institution is housed, is far from good, if, indeed, it has not actually reached the danger point. The question of a provision of more suitable accommodation is under consideration, but no definite arrangement therefor has yet been made.

To return to the Pulp and Paper division: This is primarily concerned with research work in connection with the native trees of Canada as regards the question of their value and suitability for the pulp and paper industry. This division is further divided into two sub-divisions, one of which is purely chemical and engages in research work into the chemical properties of woods, while the other exists for the specific purpose of investigating mill problems, and carrying out preliminary trials on new species of wood and other raw materials.

With regard to the first of these sub-divisions—the purely chemical—the investigations that are being carried on therein at present are of a preliminary character with the object of determining the methods of analysis which will give the most consistent results in the analysis of wood. This work of determining the methods of analysis has now been practically completed, and the relation of the chemical composition to the rate of growth in the case of white spruce is being approached. It should be obvious that if such a relation is established, it will have a very definite and important bearing on the whole problem of reforestation. The investigation in question is directed to the relation between the rate of growth and the chemical composition in the wood, and particularly to the question of whether it is worth while, having regard to the cellulose content, to encourage the development of fast-growing trees.

Much of the work in the Pulp and Paper division is, of necessity, largely chemical, for example the work done in connection with researches on bleaching. Many small investigations are carried out in the laboratory of this division. A good deal of paper analysis is also done here and this branch of the work is being developed. The laboratory is equipped with three small autoclaves, for the purpose of investigating the effect of variation in the cooking relations of sulphite pulp.

That sub-division of the Pulp and Paper division that exists for the purpose of investigating mill problems, and carrying out preliminary trials on new species of wood and other raw materials, will, in time, include in its equipment, a complete mill, comprising grinders, clippers, screens, digesters, beaters and a paper machine. At the present time there is installed a Pusey and Jones 30-inch trim machine. The mill has been idle for four years or so, but it is now starting again and will be running continuously from now on. Its maximum output capacity will be about one ton a day. But, of course, with an experimental machine, it is just a question of putting a batch through and then shutting down again, and not of running full blast all the time. In its output, the Forest Products Laboratories intended to confine itself rather to the higher grades of paper not manufactured in Canada to any great extent. But, of course, the paper machine itself is really only of secondary importance, and is used rather for the purpose of carrying out pulping trials to their definite and appropriate end in the finished product than for any other reason. This department is admirably fitted to carry out research work on beating, and by carrying the work through can get a definite result on beating in the finished article. Indeed, the big field for the Pulp and Paper division lies in beating.

As regards equipment, there are in the paper mill two Marx beaters filled with lava stone and steel bar rolls. One of these is a double beater. Their maximum capacity is, approximately, 50 and 100 lbs. respectively of air-dried pulp. It should be said, in connection with these beaters, that the motors on them have a switch board containing ammeters, volt meters and watt meters, so that the power consumption may be accurately determined. The sizing apparatus, in the form of the DeCew-Erfurt sizing system, is very complete. There is a Packer screen and the other equipment includes a Noble and Wood Baby Jordan. It has been mentioned that the paper machine is a Pusey and Jones 30-inch trim. This is run by a 12-horse power induction motor through a Reeves drive on to cone pulleys. The motor itself is wired up for two speeds. The writer's thanks are due to Mr. E. P. Cameron, associate chemist in the Pulp and Paper division for his kindness in taking him over the division very thoroughly.

What has been written may suffice to show that the Forest Products Laboratories is engaged in scientific and industrial research and technical service work of great importance—work which is bound to expand, with increasing usefulness to those concerned with woods and the products manufactured or derived therefrom, if only it receives adequate financial encouragement and assistance from the State. It should be added that the institution has a branch at Vancouver. At present, this is practically a division of Timber Tests, with a staff of four exclusively devoted to such work.

RUE HEADS PAPER DIVISION.



John D. Rue, Ph.D., formerly Professor of Industrial Chemistry at the University of Michigan and captain in the Ordnance Dept. of the United States Army has been won from the Mead Research Corp, by the Forest Products Laboratory at Madison, Wis., as head of the Pulp and Paper Division. Dr. Rue succeeds Wr. Otto Kress and we wish him all success.

The Grand'Mere baseball team opened the season lasf Sunday at the Laurentide A.A.A. park by a 6 to 2 victory over the Three Rivers team in a well-played and interesting game.

"Not All is Gold that Glitters"

If every employee could realize the amount of energy and worry that is exacted from the management of a business to provide jobs through the week and pay envelopes on Saturday, there would not be many who would refer to profits as a form of robbery. The two sides of this question are so well brought out in a letter to the Orillia, Ont. "Packet" and the reply of the Editor of that paper that we reprint both in full. No doubt this is the attitude of many an honest workman.

PROFITS IN PAPER.

Orillia, March 28, 1921.

Editor of the "Packet".

Dear Sir,—In the Toronto "Globe," issue of the 24th instant, I have noticed the following item, which I believe, should receive further publicity and comment. "A Canadian paper-making company last year on total sales of ten and a half million dollars made profits of over five millions."

Is this not a glaring illustration, Mr. Editor, of what capitalists will do? And do you not think that it is time that not only Labour, but the masses in general, should rise up in protest? And do you not think that it is time to lift the blame from labour for all the evils of high prices? The paper making companies are not the only ones either, that are sapping the very life out of the nation. The financial reports of concerns, manufacturing food, clothing, furniture, and the very necessities of Canadian life, often show a marked comparison in the way of such robbery.

"Production and more production" has been the slogan as a solution for our many difficulties and high prices and yet our government will sit back and allow 50 per cent. of the selling price of paper to go into the pockets of shareholders for not even turning their hand in the way of production. Five million dollars will support a lot of people in idleness, and yet they are generally the ones who shout for "more production" and are the first ones to grumble about the high wages that are demanded by productive workers.

Some will say that Labour as a party, should not go into politics. But how in the world are people going to live respectable and healthy lives while being robbed of unreasonable proportions of what they produce? And is it logical to expect men who are receiving these huge profits to legislate and make laws that will hamper the continual flow of their own unearned income? Yet our Parliaments certainly consist of a majority of this class. Otherwise these huge profits would not be allowed. I think, Sir, it is time we changed the slogan to "more public ownership."

The advocate of private ownership would no doubt come back at us with an illustration of the deficits of our public owned railroads. But if we are not blind we could see that these same railroads would not have become publicly owned had they not showed deficits under private ownership.. Furthermore, there are hundreds of millions of dollars that was formerly spent on railroad traffic which is now going to the automobile manufacturers, and gasoline merchants, which lessen the earnings of the said railroads to a great extent.

Far too much of our time is spent for the earning of profits for some one who may be living in Montreal, Winnipeg, Atlantic City, loafing in their lives, and being of no earthly good in the least, social butterflies so to speak, but still it would insult a real butterfly if it heard me compare him with such do-nothings, for a butterfly will exert itself enough to hunt its own food, while hosts of able bodied human beings refuse to even drive their own car, or whisk their own clothes, the results of profits.

Robbery, in Canada is supposed to be a criminal offense, yet in may cases, such as the above mentioned, it seems to be a virtue instead of a crime. Profiteering, should and must be stopped, sooner or later, and your valuable paper would, I think, serve no better purpose than to urge upon the people to unite in war against it. The leafer, be he rich or poor, must be given a wide birth in Canada if we expect to become a healthy, prosperous people.

The profit-monger is the cancer that is eating the very vitals out of the nation. He raises the cry that high wages forces him to raise the price of his products, yet at the end of the year he boasts of millions of dollars profits. And if you notice, nearly every succeeding yearly report is a record in profits, more especially in the key industries such as, flour milling, textiles, canneries, boots and shoes etc., products of which are vital necessities to all people.

Is it fair, Mr. Editor, to the employer who ist trying to do the square thing by his employees, to have his men coming at him every little while for a raise in wages? Does it seem just, that he should be forced to increase his pay roll and oftimes suffer a loss in the filling of a contract which he may have made to supply his products at a close price? Quite generally the employees are blamed for making the demands. Yet when the necessaries of life are at stake, and when we consider the obligation that every man is under, to himself, his family, and the community, would he not be a coward if he failed to take action one way or other? Nevertheless the profiteer is really to blame, really at the root of the trouble and friction which often exists between employers and employees.

Political action is necessary in the extreme, and in my opinion a commission, composed of honest men, with authority to investigate costs of production and to regulate profits, would work wonders to the benefit of the nation. Capitalists would no doubt say that it would hamper the prospects of investments into industry, and that such a scheme would retard the growth of Canada into an industrial nation. But really I am sure the country would be far better off without the capitalist who is in search of profits only.

Yours truly,

FACTORY HAND.

(NOTE.—Since our friend, whom we know to be a good fellow, who is always fair to his own employer, appeals to the "Packet," we venture to point out to him that he has overlooked some important considerations. The Company referred to in the "Globe's" paragraph is doubtless the Abitibi Power and Paper Company. If so, it should be mentioned that against the gross earnings of five million dollars are to be set various items of interest, depreciation, etc., which reduced the net profits to a point where the Directors did not feel justified in declaring a quarterly dividend of more than 4 per cent. One of these unpaid items is business profits tax to be paid the Government, estimated at over a million dollars. If the "Globe" did not mention these facts it is only an illustration of how newspapers foment unrest by telling half truths. Doubtless the Company is putting aside something for a "rainy day," but this is good business for companies as well as individuals. Paper companies have not always paid dividends.

2.—While the high price of paper has been hard on newspaper publishers, (this is perhaps the reason for the "Globe's" attitude) and has added to the cost of newspapers to the public, it has on the whole been of tremendous advantage to Canada. 85 p.c. of the total Canadian production of newsprint is exported. This means that Canada gets a big price for this 85 per cent and the Canadian public has to pay high prices for only 15 p.c. Canada's export of pulp and paper during the past year amounted to the enormous total of over 150 million dollars. Had it not been for this the situation with regard to American exchange would have been much worse than it has been, resulting in higher prices for coal and other commodities imported from the United States.

3.—Far from pampering the people with large incomes, the Government is making them turn over a large part of their profits to pay the country's war burdens. In addition to the $1,200,000 business profits tax mentioned above, all the shareholders will have to pay income tax. And the higher the income the higher the tax. Thus a married man with an income of $3,000 has to pay only $40 income tax, or 4 per cent. on $1,000. But one with an income of $10,000 has to pay $619.50, or 20 per cent.; on $100,000 it is $32,749.50, or nearly 33 per cent.; and on $500,000 it is $318,349.50, or over 63 per cent. In addition to this, incomes from business dividends are now liable to municipal income taxes. So that it will be seen that, on the whole, the country is sharing very substantially in the profits of the paper industry.

4.—The situation in connection with the paper industry is abnormal. The supply in the United States has been far below the demand. As pulp and paper mills cannot be built in a day, or a year, this will continue to be the case for some time. The result is high prices. If the Canadian manufacturers didn't get the profits American middlemen would, as they did when there was a shortage of coal. Meantime the Canadian working men and manufacturers engaged in the paper industry, the shareholders in paper companies and the Government and people of Canada generally are profiting by the situation in the United States. The chief sufferers are the publishers of newspapers, who have been unable to recoup themselves for the enormous increase in costs. But we don't see why the workingmen should be exercised over a situation which means work for many of them, at good wages, and big revenue for the Government.

5.—Does not most of the trouble at the present time arise from the fact that there are many industries that are not paying dividends? The same paper that told of the Abitibi Power and Paper Company's big profits, announced that the Ames-Holden McCready Co., whose shoe factory was closed for more than six months, had gone behind $1,462,414 last year. Would it not have been better for everybody if the Company had made a million and a half, instead of losing it, and had kept its men employed all the year? The men would have had their wages, the Government would have collected a large profits tax, and the shareholders would have had dividends to spend. The "Packet" heard the other day of a Company whose factory was shut down and who has been losing $10,000 a week. Would it not be better for his men if they were working, and their employer was making $10,000 a week? Most of the money thus accumulated (which isn't taken by the Government) finds its way back into industry. Only a comparatively small proportion is spent on personal luxury. For those who do waste their incomes in idleness and extravagance the "Packet" has not a word to say.

6.—Another thing, if, as our correspondent suggests, profits are to be restricted when an industry is flourishing, who is to pay the losses in dull times?

We have gone into the points raised in our friend's letter at some length because we feel that the attitude he takes is not uncommon, and has much to do with the present business depression. Capitalists naturally hesitate to embark on new enterprises while there is so much unrest and uncertainty. The tremendous demand for municipal and Government bonds indicates that they are putting their money where they will be sure of dividends and free from criticism. But such a course, if generally followed would be fatal to the industrial progress and prosperity of the Dominion.—(Editor "The Packet".)

MATTAGAMI HAD A PROFITABLE YEAR.

Toronto, May 16. — One of the newer enterprises, the Mattagami Pulp and Paper Co., has issued its first report on operations covering the seven months ended December 31, 1920. No dividends have yet been paid, and the company has made a liberal allowance of $346,352 for losses from operations during the construction period and for depreciation of inventories, leaving a balance carried forward of $188,068. Net profits from operations were $1,091,779, from which was deducted $187,423 for interest on bonds, debentures and bank loans and $369,934, for depreciation and other reserves, leaving net earnings after interest and depreciation of $534,421.

The company's plant at Smooth Rock Falls, Ont., comprising mill, water power development and townsite was completed during the year to a balanced production of 45,000 tons of easy bleaching sulphite pulp per annum.

"Due to the necessity of carrying on construction during the year and the handicap of high labor and material costs," says president Duncan Chisholm, "your company was unable to participate fully in the extremely profitable market during the summer months. The operations for the year, however, have resulted in a substantial profit, and by utilizing same your directors have been able to place your company in a most efficient operating position, with inventories, logging operations, etc., written into the balance sheet at most conservative figures."

It is the opinion of the president that the present dull market condition for all grades of pulp is but temporary, but as it is not advisable to store large quantities of pulp for which there is no market immediately available, the operation of the plant has been suspended until the market revives.

PAPER SPECIFICATION — 1683.

Extract from historical notes of a work called "The Art of Paper Making", written in French by Augustin Blanchet in 1683.

For the paper perfectly to suit my use, it must also be white, it must not contain any shameful impurities, no bad wrinkles must furrow it, and no audacious unevenness must appear on its surface, but the pen must run over the whole of it without any obstacles, and by its snowy whiteness it makes the black lines it bears appear blacker to the reader, although the ink used is always the same.

PULP PRODUCTION IN THE U. S. IN MARCH.

The following is a tabulation by the Federal Trade Commission of the production, and stocks of finished pulp, in tons of 2,000 pounds on an air-dry basis, for March, 1921, compared with March, 1920, for the operating mills:

	Number of mills	On hand first of month	Production for month	On hand end of month
Ground Wood Pulp:				
March, 1921..	166	155,997	142,850	182,027
March, 1920..	167	105,574	139,667	109,288
Sulphite News Grade:				
March, 1921..	62	22,728	55,370	24,628
March, 1920..	63	18,896	72,904	18,543
Sulphite, Bleached:				
March, 1921..	31	13,229	25,057	14,147
March, 1920..	33	6,210	46,643	6,682
Sulphite, Easy Bleaching:				
March, 1921..	8	1,774	5,968	918
March,, 1920..	8	941	5,392	873
Sulphite, Mitscherlich:				
March, 1921..	7	3,990	3,467	2,834
March, 1920..	7	1,560	7,008	1,677
Sulphate Pulp:				
March, 1921..	19	3,354	7,892	8,067
March, 1920..	21	4,808	18,759	5,146
Soda Pulp:				
March, 1921..	26	9,378	21,116	9,742
March, 1920..	27	3,282	36,031	3,538
Other than Wood Pulp:				
March, 1921..	4	156	612	155
March, 1920..	4	157	739	117
Total—for all grades:				
March, 1921..	—	216,606	262,332	242,516
March, 1920..	—	141,428	327,143	145,864
3 yr. March aver.	—	.....	303,912	180,880

Total stocks of all grades of pulp in the mills on March 31, amounted to 242,516 tons. Mill stocks of ground wood pulp, news grade sulphite, bleached sulphite, and soda pulp increased during the month.

Ratio of Stocks to Average Production.

Comparing the stocks on hand at the domestic pulp mills at the end of the month with their average daily production based on the reports covering the years 1917, 1918, 1919 and 1920, the figures show that:

Ground wood pulp stocks equal slightly more than 39 days average output.

News grade sulphite mill stocks equal slightly less than 10 days average output.

Bleached sulphite mill stocks equal slightly more than 8 days average output.

Easy bleaching sulphite mill stocks equal about 4 days average output.

Mitscherlich sulphite mill stocks equal 11 days average output.

Sulphate mill stocks equal slightly more than 15 days average output.

Soda Pulp mill stocks equal slightly less than 8 days average output.

Mill stocks of "other than wood pulp" equal about 4 days average output.

Total mill stocks of all grades equal slightly less than 22 days average output.

Loss of production, amounting to 224,699 grinder—or digester—hours in March 1921 as compared with 158,462 for March 1920, was due largely to lack of orders, which amounted to 128,045 hours. Output was well maintained in spite of this fact.

Wall paper concerns had 4 tons less on hand April 1 than on March 1, though that figure for 1921 is about 4,000 tons greater than for 1920. Stocks of finished paper decreased by 2,130 tons during the month, to a figure that is less than for the past two years.

JAPANESE PULP AND PAPER EXPERT ON A VISIT HERE.

Iroquois Falls had a visit recently from a very distinguished Japanese business man, J. Kobayashi, who spent a day with H. G. Schanche, of the Forestry Department, and in a trip through the Groundwood and Sulphite mills.

He is a representative of a large pulp and paper company in Japan who are studying methods in vogue in this continent. He says that the bulk of the pulp used in Japan is imported, but that a certain amount of spruce is grown there, and the pulp and paper companies are doing all they can to encourage its growth. The machinery used in the Japanese mills is the most up-to-date English and American machinery, and with the knowledge gained of methods here, Mr. Kobayashi and his confreres in Japan hope to be able to utilize what spruce they have and also other woods, in the manufacture of pulp and paper.

WANT CALENDARS AND PAPER.

A well-known South African stationery house with head-quarters in Cape Town desire to negotiate with a Canadian publisher of calendars for trade purposes. Samples, prices, and full particulars desired with first letter.

A Cape Town commission house, trading throughout the Union territory, desire to get into touch with Canadian manufacturers of kraft paper, pulp boards, and show boards, the latter for cardboard box-making. Fullest particulars desired with first letter.

These are Inquiries 3059 and 3060 of the Dept. of Trade & Commerce, Ottawa.

FOREST PRODUCTS MADE GOOD PAPER.

Tuesday was distinctly visitors day at the Forest Products Laboratory on University Street, Montreal. Escorted by Supt. Kynock and his staff, the Montreal Division of Graphic Arts and the Montreal Paper Club visited all the departments and saw the excellent equipment and interesting work which the laboratory is prepared for carrying on. Between 150 and 200 guests were entertained during the day. A feature of the visit was the actual manufacture of paper on the experimental machine which turned out a very creditable sheet. It is interesting to note that the pulp was some of the standard unbleached sulphite which was obtained from the Riordon Company five years ago and has since been stored at the laboratory. A more complete description of the laboratory is given on another page.

WHAT'S THE DIFFERENCE?

Sambo (calling from jail window): "Hey, man what time is it?"

Jumbo (looking at his watch and then replacing it: "What's the difference? You ain't goin' nowhere."

Mr. Foreman, if you allow your department to get into such a condition that some of your men get hurt, or perhaps lose a leg, eye, hand or foot, or perhaps their lives, who is to blame? Where does the responsibility rest? Think this over.

Technical Section

REVIEW OF RECENT LITERATURE.

A-15; L-0. Production of Oxycellulose Free from Saline Matter. Ger. patent No. 314,311, R. ADLER, Vienna, Jan. 9, 1914. **J. Soc. Chem. Ind., xxxix,** 60A (Jan. 31, 1920). Salts of oxycellulose are mixed with an inert solvent, such as MeOH or EtOH, Et or amyl acetate, or acetone, and then treated with an acid of which the corresponding metallic salt is soluble in the solvent used; the free oxy cellulose is then washed with more of the solvent and dried at a low temperature. The dried product forms a hard transparent mass which is completely soluble in alkalis and can be used for the preparation of cellulose solutions.—A. P.-C.

E-2; F-2. Dry Distillation of Soda or Sulphite Waste Liquors. Ger. patent No. 513,607, E. L. RINMAN, Stockholm, Sept. 1, 1915. **J. Soc. Chem. Ind.,** xxxix, 15-16A (Jan. 15, 1920). The use of milk of lime instead of finely powdered CaO or $Ca(OH)_2$ results in a 30 per cent increase in the yield of acetone. Soda waste liquor, for example, is concentrated to 30° Be. (sp. gr. 1.26) and mixed with a quantity of milk of lime corresponding to 400 kg. CaO per 1,000 kg. of wood. The mixture is concentrated to 55° Bé. (sp. gr. 1.62) and then distilled with superheated steam, the temperature being slowly raised to 500° Cent. The yield is about 40 kg. of acetone and 50 kg. of oil per 1,000 kg. of wood. —A. P.-C.

E-2. Substitute for Turkey-red Oil from Pulp Waste Liquor. Ger. patent No. 310,541, Chem. Fabr. Florsheim. H. NOERDLINGER, Florsheim, Dec. 19, 1915. **J. Soc. Chem. Ind.,** xxxix, 164A (Feb. 28, 1920). The so called "liquid resin" obtained as a waste product in the production of pulp from pine wood, is distilled under reduced pressure. The distillate contains an oil and a solid acid resembling a fatty oil and abietic acid. After the separation of any crystallizable constituents, the distillate is sulphonated with H_2SO_4. The resulting sulphonic acids, which are almost completely soluble in water, give solutions which can be rendered almost neutral, but complete neutralization gives rise to semi-solid or gelatinous soaps. The solutions form convenient media for the emulsification of all kinds of oils, fats and organic liquids generally, with water; they can also be applied in the textile industry for mordanting, dressing, and other purposes, and the production of emulsified lublicants and of disinfectants. —A. P.-C.

E-5. Manufacture of Pulp from Wood or other Cellulosic Material. Ger. patent No. 304,214, ZELLSTOFFFABRIK WALDHOF, and H. CLEMM, Mannheim and R. WILLSTATTER, Munich, Oct. 20, 1916. **J. Soc. Chem. Ind.,** xxxix. 60A (Jan. 31, 1920). The material is treated with liquid or gaseous reagents at a comparatively moderate temperature, but at a greatly increased pressure created not entirely by heating the liquid, but largely by forcing in liquid or gas. The digestion may be carried out under a pressure of 50 atmospheres in order to obtain a good penetration of coarser material and a more complete digestion. The avoidance of high temperatures while maintaining all the advantages of high pressure gives a cellulose fiber in a better state of preservation than by the usual process, and the constituents of the spent liquors are less profoundly decomposed, so that the by-products may be more advantageously utilized. The process may also be employed in the saccharification of cellulose. A. P.-C.

F-0. Wood Cellulose as a Substitute for Cotton. Ger. patent No. 306,366, W. SCHACHT, Weissenfels, March 14, 1918. **J. Soc. Chem. Ind.,** xxxix, 60A (Jan. 31, 1920). Woodpulp prepared by any of the alkaline processes is further digested by boiling with a sulphite solution. The gelatinous substances (hemicelluloses) which are present in soda woodpulps are removed by the sulphite treatment, and a highly purified cellulose is obtained, suitable for use as a substitute for cotton in the chemical and papermaking industries. A.-P.C.

K-2; K-18. Utilization of the Spent Lime Liquors from Straw Paper and Strawboard Mills. Ger. patent No. 314,054, R. ADAM, Bremen, March 23, 1917. **J. Soc. Chem. Ind.,** xxxix, 60A (Jan. 31, 1920). The spent liquor separated from the straw pulp by mechanical means, is evaporated, dried, and the residue subjected to destructive distillation. The products resemble those from the distillation of wood and comprise acetone and MeOH.—A. P.-C.

K-7. Continuous Beating and Refining Engine. Br. patent No. 135,733, T. H. NASH, St. Paul's Cray, March 15, 1919. **J. Soc. Chem. Ind.,** xxxix, 60A (Jan. 31, 1920). A series of beating rolls is mounted in a common trough, the bottom of which is so constructed that the pulp and the like gradually ascends whilst passing under the rolls, and is thereafter returned by pipes or ducts passing through or beneath the bottom, to an opening in the wood plate, by means of which the stream of pulp passing from the feed plate may be narrowed, thereby causing the pulp to pass under the rolls a greater number of times.—A.P.-C.

K-8. Coloring Paper Pulp with Sulphur Dyestuff (thiophor dyestuffs). Ger. patent No. 298,826. C. JAGER, G.m.b.H., Dusseldorf, March 17, 1916. **J. Soc. Chem. Ind.,** xxxix, 60A (Jan. 31, 1920). A collodial suspension of a sulphur dyestuff, which may be prepared by boiling the dyestuff with Turkey-red oil, or "monopol oil", is reduced by an alkaline solution of hydrosulphite, and the leuco compound, so obtained is added to the pulp in the course of manufacture; it has a strong affinity for the pulp and the coloring reoxidation and fixation takes place in the cold, the pulp being sized at the same time. If H_2O_2 be used as the oxidizing agent and $Al_2(SO_4)_3$ as the fixing agent, very brilliant shades are obtained. A. P.-C.

K-10. Process of Sizing Paper. Ger. patent No. 314,146. H. WANDROWSKY, Berlin, Nov. 30, 1917. **J. Soc. Chem. Ind.,** xxxix, 60A (Jan. 31, 1920). Sizing is effected by means of the natural resins present in the pulp by adding substances having an alkaline reaction to the pulp during the beating in order to convert the resin into a resinate, which is then precipitated on the fibers by $Al_2 SO_4)_3$.—A. P.-C.

K-10. New Sizing agent for Paper.—Ger. patent No. 303,925, Holzverkohlungs-Ind., A.-G., KONSTANZ, Feb. 24, 1916. **J. Soc. Chem. Ind.,** xxxix, 60A (Jan. 31,

1920). Alkaline solutions or suspensions containing products of the condensation of tar and aldehydes in the presence of alkalis are added to the paper pulp, and the sizing constituent is precipitated by substances with an acid reaction. Example: Beechwood tar is freed from acetic and other acid substances and then condensed with formaldehyde in the presence of alkali. The quantity of formaldehyde is so chosen that it is not sufficient to condense the whole of the tar constituents. Paper can be satisfactorily sized with 1 per cent of the product. The product may also be mixed with bakelite resins soluble in alkalis.—A. P.-C.

K-10. Paper Size. U. S. patent No. 1,317,616, J. A. DE CEW, Montreal, Canada, Sept. 30, 1919. **J. Soc. Chem. Ind.,** xxxix, 103A (Feb. 16, 1920). Rosin soap containing over 25 per cent of free rosin is diluted and then discharged into a cold solution of sodium silicate until the total dilution corresponds approximately to 2 per cent of total solids. (See also Fr. patent No. 499,415, **Papeterie, xlii,** 269-70, March 25, 1920; **Pulp & Paper** xviii, 756, July 15, 1920.)—A. P.-C.

K-10; K-23. Waterproofing process. U. S. patent No. 1,317,618, J. A. DECEW, Montreal, Canada, Sept. 30, 1919. **J. Soc. Chem. Ind.,** xxxix, 103A (Feb. 16, 1920) Waterproof paper is made by incorporating with the paper stock a sizing agent, a precipitating mixture of wax, rosin, and alumina, then drying the product and heating to the fusing point of the sizing mixture.—A. P.-C.

K-10. Process of Treating Paper Size. U. S. patent No. 1,317,619, J. A. DECEW, Montreal, Canada, Sept. 30, 1919. **J. Soc. Chem. Ind.,** xxxix, 103A (Feb. 16, 1920). A sufficient quantity of alkali is added to the paper stock in the beaters or mixers so that the concentration of the basic ions will prevent the formation of alkaline-earth resinates by the salts existing in solution; a resin size is then added and precipitated by $Al_2(SO_4)_3$.—A. P.-C.

K-11. Arrangement for Ensuring the Movement of Fourdrinier Guide Rollers. Ger. patent No 308,372, FARBW. VORM, MEISTER, LUCIUS und BRUNING, Hochst, May 12, 1916. **J. Soc. Chem. Ind.,** xxxix 153A (Feb. 28, 1920). The guide rollers are provided with rings of elastic material such as rubber or felt, which press lightly into the wire and ensure their sympathetic movement, thereby preventing friction and rapid wear due to the usual tendency of the rollers to remain stationary.—A. P.-C.

K-11. Arrangement for Drying Paper, etc., in Continuous Strips. Ger. patent No. 309,543, H. MALLICKH, Gross-Sarchen, Feb. 16, 1917. **J. Soc. Chem. Ind.,** xxxix, 153A (Feb. 28, 1920). The bands of paper or other material are passed over steamheated cylinders and at the same time subjected to a blast of air of a different temperature from the cylinder. By arranging the drier in several sections filled with air at different temperatures, it is possible to introduce into any section the air issuing from a previous section.—A. P.-C.

K-14. Process and Apparatus for Seasoning and Rectifying Paper-stock. U.S. patent No. 1,325,044, C. E. POGGEL, Louisville, Ky., U.S.A., Dec. 16, 1919. **J. Soc. Chem. Ind.,** xxxix, 153A (Feb. 28, 1920). A process of seasoning and rectifying paper-stock consists in blowing currents of heated air upwards between the sheets which are suspended within an enclosure. After passage between the sheets the air is again made to travel in the same cycle.—A. P.-C.

K-18. Manufacture of Light Weight Millboards from Tree Barks. Ger. patent No. 305,697, O. ZIMMERMAN, Berlin-Lichterfelde, Aug. 16, 1917. **J. Soc. Chem. Ind.,** xxxix, 59A (Jan. 31, 1920). Tree bark is ground in a kind of bone mill, beaten in a hollander, and delivered to a strainer, from which the beaten stuff, diluted with water passes to a millboard machine on which it is worked up as the middle layer of the finished board. The bark pulp has a certain coloring power for boards made of waste papers, and yields a board of low sp. gr.—A. P.-C.

K-23. Process for Impregnating Paper Fabrics. Ger. patent No. 307,771, GEBR. HEYL and Co., A.-G., Charlottenburg, Aug. 14, 1917. **J. Soc. Chem. Ind.,** xxxix, 104A (Feb. 16, 1920). The goods are impregnated with mixtures containing wood tar or wood tar oils and cellulose esters, particularly in combination with amyl acetate. The impregnated fabric may be used as a material for water buckets, tent covers, ground cloths, wagon sheets, etc.—A. P.-C.

K-0. Process for Rendering Absorbent Waste from Paper Industries. Ger. patent No. 307,611, REIS und CO., Friedrichsfeld, Feb. 20, 1918. **J. Soc. Chem. Ind.,** xxxix, 185A (Mar. 15, 1920). Addition to Ger. patent No. 303,302, **J. Soc. Chem. Ind.,** xxxix, 15A (Jan. 15, 1920). After the chemical treatment and before drying the waste is left a long time exposed to the action of the solution of the residue of softening reagent (alkali, etc.) remaining in the material. This gives a more permanent absorbent quality than if the softener is thoroughly washed out before drying.—A. P.-C.

L-4. Container Board Substitute for Cedar Wood. Br. patent No. 133,732, E. C. R. MARKS, London, assignee of Cedaroid Company, Inc., Rochester, N.Y., U. S. A., Sept. 11, 1918. **J. Soc. Chem. Ind.,** xxxix, 103A (Feb. 16, 1920). Same as Fr. patent No. 491,778. See **Chimie & Industrie** iii, 74 (Jan. 1920). **Pulp and Paper,** xviii, 757 (July 15, 1920).—A. P.-C.

L-7. Durable Textile Yarns from Paper. Ger. patent No. 313,520, M. MULLER, Limbach, and S. HERZBERG, Charlottenburg, Jan. 15, 1918. **J. Soc. Chem. Ind.** ,xxxix, 103A (Feb. 16, 1920). String, rope, etc., or the constituents used in preparing them, particularly materials composed of paper yarn, are coated with metal by the spraying process. The metal-coated textiles are distinguished by a high tensile strength and resistance to external influences.—A. P.-C.

L.-7. Textile Fiber from Wood. Ger. patent No. 305,141, K. MUTTER, Triptis, Nov. 11, 1917. **J. Soc. Chem. Ind.,** 102A (Feb. 16, 1920). The fibers are isolated only from the summer wood portions and the annual rings, which contain the strongest fibers. The annual rings are peeled off from the woody stem and are freed from the soft fiberless layers of the spring growth. The coherent layer of summer growth is treated chemically for the removal of the whole or part of the lignin and resins, and the resulting cellulose fibers are separated by mechanical treatment.—A.-P. C.

L-7. Waterproof Impregnation of Paper Textiles. Ger. patent No. 305,024, M. LINKE, Remscheid, June 26, 1917. **J. Soc. Chem. Ind.,** xxxix, 103A (Feb. 16, 1920). Paper fabrics or the stitched articles made from them are steeped in water until they show no further shrinkage, and are then treated, slightly damp or after drying, with an impregnating material which may be composed of chalk, lithopone, a binder consisting of an oil lacquer containing fatty matter and a thinner such as oil of turpentine or a substitute.—A. P.-C.

PULP AND PAPER NEWS

At a meeting of the Bookbinders' Union at Toronto last Sunday it was agreed that there should be a ten per cent. assessment of the wages of the membership of the union, retroactive to May 1, to meet any levy which may be necessary if there is a bookbinders' strike in this city on June 1, for a 44-hour week and increased pay. Other unions of the printing trades in Toronto have taken similar actions. It is said that negotiations looking for a possible satisfactory settlement of the question of wages and working hours may be under way this week.

The printers' strike in Peterboro terminated last Saturday with the adoption of a tentative agreement granting the job printers a forty-four hour week with a $30 a week scale. The news men will go back to work at 48 hours and an increase of $1.50 weekly, bringing their scale up to $31.50. The printers originally demanded an increase of $8 weekly. The strike lasted exactly two weeks. The new agreement will continue in effect for three years, but can be opened up each year for wage readjustment up or down, according to the cost of living.

Many forest fires, attributed to the exceptionally dry weather experienced lately, occurred last week in Northern Ontario.

The Hon. Phillippe J. Paradis, member of the Quebec Legislative Council, stated last week, on his return from a three months' trip to Europe that, when the German indemnity is paid, the lumber business in Canada will be greatly benefitted. There is, he states, millions of feet of Canadian lumber in England which the French want, but cannot purchase because of lack of funds. The French Government has promised to buy this as soon as the money is forthcoming and the result will be greatly increased orders from this country.

In returning to work the printers at Regina, Sask., receive the same hours rate of pay as previously. In job offices a 44-hour week, entailing a loss of four hours' pay a week over the former wages, will prevail, while the men in newspaper offices, who will continue at the 48-hour week, will receive the same pay as formerly.

Negotiations between the master printers and their employees in the job printing plants at Ottawa last week failed to reach an understanding as to new agreements to take the place of those expiring on June 1. President E. S. Lee, from the typographical union local, flatly refused to enter into any discussion on the question of the 44 hour week for job printers, and was then notified that further negotiations would be useless, as the Master Printers' Association was determined not to concede this demand of the union. Should the deadlock not be broken by June 1 and the strike occur, it will involve about 100 members of the union employed in the different job printing establishments of the capital.

The master printers of Hamilton, Ont., last Thursday declared for the open shop, and twenty employing printers advertised for men and will ignore the union printers who are on strike. About 300 men who have been employed as printers, pressmen and binders are affected. The employers claim that with prices falling the men are not justified in asking for a reduction in working hours from 48 hours a week to a 44 hour week at the same rate of pay as they have been receiving $35 a week. "Now that we have decided on an open shop there will be no delay in getting on with the work," one of the employing printers said tonight after the meeting. It was stated that only one employer at the meeting opposed the decision in favor of the open shop.

Mr. R. J. King, of Dayton, Ohio, was a visitor in Montreal this week in company with Mr. H. S. Taylor, of H. S. Taylor, Ltd.

Major A. M. Moffatt, President and Manager of the Shackleton Pulp and Lumber Company, which is operating a soldier's settlement scheme about fifty miles west of Cochrane, was in Toronto a few days ago on business connected with the marketing of the pulpwood being taken off the company's limits. In addition to the returned men who have taken up land in the township, the company has about thirty men employed and it is expected that when things get thoroughly organized about 15,000 cords of pulpwood a year will be handled. Several portable rossers are being put in and one will be installed very shortly. All told, the men up there have 6,000 acres laid aside for them. W. L. Bland is the woods manager of the company.

"Speed Up, There's no hard times coming, Its just soft times coming" is the cheering legend on a neat blotter sent out by E. A. Crippen, paper mill representative, King Street, West, Toronto.

The Doheny Pulp, Hardware and Lumber, Limited, with head office at Montreal, and a capital stock of $50,000, has been granted incorporation by the Dominion Government, with power to deal in Lumber, pulpwood, paper, etc. The incorporators are Johnny Lamothe, Philias Leveille and Joseph Paul Leveille, lumber merchants, and Joseph Napoleon Hudon, commercial traveller, all of Montreal. Another Dominion incorporation is that of the McCraney Lumber Company, Limited, with power among other things to carry on business as pulp mill owners. Among the incorporators are G. H. Long and F. R. Burton, lumber merchants of Hamilton, Ont., which is named as the head office. The capital stock is $40,000.

John Castell Hopkins is named as one of the provisional directors of the Canadian Review Company, Limited, which has just been granted a charter by the Ontario Provincial Secretary's Department, Toronto. The company is authorized to carry on a general printing and publishing business, the capital stock being $40,000 and head office, Toronto.

Paper lying too close against window and becoming ignited by the powerful rays of the sun, is blamed for a fire at A. L. Florence's paper warehouse in Ottawa on May 9th, causing damage estimated at $25,000. The

fireproof structure of the building prevented serious spread of the flames.

Medical advices as to the effect of high water on Lake Timagami, occasioned by the Spanish River Pulp and Paper Mills Company's dam, was placed before the Timber Commission in Toronto the other day. It was stated that the dam had been built in secret by the company twenty years ago and it was claimed that the high water resulting had destroyed the shore line. Col. Gibson, vice president of the company, showed that what his company had done respecting the water levels of Cross Lake and Lake Timagami, had been occasioned by commercial necessities.

The will of the late Sir William Gage, head of the W. J. Gage Company, manufacturing stationers, Toronto, has been probated and amounts to $900,660. According to the will the well known manufacturer and philanthropist made many charitable bequests including gifts to the Toronto Free Hospital for Consumptives, the National Sanitorium Association and the Ina Grafton Homes. During the last seven years Sir William gave to charities approximately $375,000.

Mr. Scott, representing Hanson, Scott & Co., of London, Eng. who are big twine dealers, spent a few days recently in Toronto.

John MacLaurin, of the Ideal Coated Paper Company, of Brookfield, Mass., was a business visitor in Toronto last week.

Paper Sales, Limited, Yonge Street, Toronto, have been appointed agents for Ontario and Quebec of the Arabol Manufacturing Company, of New York, manufacturers of glues and gums used extensively in the paper box manufacture.

A. C. Thompson, of the Schofield Paper Company, St. Johns, N.B., was in Toronto a few days last week.

The William Hamilton Co., Limited, Peterborough, have recently completed the installation of the following equipment: two dryers, with 32 cylinders for sulphite at the Edmunsdon N.B. mill of Fraser Companies, Limited and six centrifigal screens for the same company, and two screens for Price Brothers & Co., Limited at Jonquiere, Que.

Mr. G. W. Pauline, of Ritchie & Ramsay, coated paper manufacturers, Wellington Street, Toronto, has returned from a trip through Michigan where he visited a large number of the paper concerns. He reports trade there as being very dull with no immediate prospect of improvement.

For the purpose of taking over as a going concern the business being conducted at Midland and Penetanguishene by Manley Chew, including all the Canadian and American patents, the Solidbord Company, Limited, has been granted an Ontario charter, with authority to manufacture fibre board or solidboard or any manufactured product from sawmill waste.

The capital stock of the Timiskaming Pulp and Paper Company, Limited, which has been organized to build a ground wood mill near Haileybury, has been increased from $500,000 to $1,000,000.

B. F. Avery of the Spanish River Pulp and Paper Mills, Limited, who with Col. Jones, the general manager, have been in Toronto during the past few days, states that approximately thirty plants are affected by the sulphite pulp and papermakers strike. Spanish River and Abitibi have about 3,000 men out and there seems no probability of an immediate settlement. The woods force of the Spanish River Company, however, will be kept working getting out pulpwood against the time of resumption.

Losing everything but the clothes in which they stood, and their motor car, which Mrs. Brown heroically drove out of the burning building, the four members of the family of R. Norman Brown, of Brown Bros., stationers, Toronto, barely escaped with their lives when their recently purchased summer residence at Jackson's Point was burned to the ground on Tuesday night of last week.

Arthur Partridge, at one time of the St. John, N.B. Globe, but more recently of the Worcester, Mass. Telegram and the Rochester Post Despatch, has been appointed Advertising Promotion Manager of the Canadian Daily Newspaper Asociation, the head office of which is located in Toronto.

The Republic Flow Meters Co., of Canada, Limited, Toronto, have sent out circulars to their customers announcing a change in the name of their organization which is now known as Dominion Flow Meter Co., Limited. The organization has been augmented and the original personnel retained. The design of equipment is in no way changed.

C. Howard Smith, President of the Howard Smith Paper Mills, Limited, Montreal, was in Toronto last week on business.

The first issue of a new monthly publication, "The Canadian Stationer and Book Trade Journal" has reached the Pulp and Paper Magazine. The periodical is being put out by Findlay I. Weaver, an experienced trade paper man who got his early experience in the printing and stationery business in Kitchener, Ont., and who, more recently, was editor of Bookseller and Stationer. The new journal, which is being published in the interests of the book, stationery and allied trades, has set a high standard typographically and in general get-up and the initial number contains a lot of valuable matter liberally illustrated. Under Mr. Weaver's editorship this latest venture into trade journalism should be a success.

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308 TONS A DAY AT LAURENTIDE.

An average of 308 tons of newsprint daily for the month of April is the greatest output of paper in the history of the Laurentide Company in a similar period, according to the figures for the month, which have been recently compiled and published in the Digester. The new machines contributed 100 tons of this daily total on the average, doing the best they have done since their installation, while there was an increase of some 30 tons on the old machines over the March figures. The board machine turned out an average of 47.2 tons daily during the month.

Averages for 24 Hours—April 1921.

	Newsprint Machines		Board Machine
	2 to 7	8 and 9	
Capacity. . .	239.4	142.1	51.2
Production . .	208.5	100.2	37.2
Efficiency . . .	87.1%	70.4%	92.0%

After making an inspection trip through nine states and visiting many mills, a safety engineer reports that he found only one saw filer who thought enough of his eyes to wear goggles while working around emery wheels. Isn't easy now to understand why there are so many blind folks in this country?

UNITED STATES NOTES

Assertions by the union leaders to the effect that the mills just tied up had a total output of 4,000 tons of newsprint daily, were contradicted in a statement issued last Friday by the News Print Service Bureau. It was stated that the seven mills referred to produced only 1,280 tons of news print a day. All of the mills which shut on May 1 and 11 and April 19, produced, according to the bureau, 3,400 tons a day, which was said to be 40 per cent of the total output for the United States and Canada.

The third annual convention of the National Paper Box Manufacturers' Association was held at the Waldorf-Astoria Hotel, New York, last week. Desire to effect further price reductions without resorting to wage cutting was the dominant feeling at the sessions, and the majority of speeches concerned the means of attaining this end. Among the suggestions were a uniform cost system to cover the entire industry, various new labor saving devices, improved arrangement of work, and industrial training to increase the production of the individual employee. Reports read by members reflected a discouraging condition of the market. Apathy on the part of the buying public, it is said, had reduced sales to 50 per cent of normal, but this is 15 per cent above sales in February. Among the speakers were W. C. Carlson, president of the largest box concern in the country; B. C. Forbes, editor of Forbes Magazine; George F. Barber, president of the Barber Industrial Service Company, Percy S. Straus, of R. H. Macy & Co. Senator Lenroot of Wisconsin was the chief speaker at the closing banquet. Herman N. Hess was chosen president and F. B. Seigfried of Newark, Vice President of the Eastern District.

In its annual report for the year ended Dec. 31, 1921, the American Writing Paper Company shows net profits of $1,687,673 after all deductions equivalent to $7.66 a share on the $2,000,000 of capital stock. The profits were $435,095 in 1919. Gross profits were $5,112,395, as against $2,272,699 the previous year. With the exception of 1916, profits last year were the largest ever reported. President George A. Galliver said that conditions prevailing at the close of last year were fully reflected in the markets for raw materials and supplies as well as for paper. Actual inventories were taken of all paper finished and in process, raw materials and supplies. Inventories carried in the balance sheet aggregating $6,873,391. "The general situation in the paper industry," said Mr. Galliver, "is not yet clear, and predictions for the immediate future cannot safely be made. Production has not, however, materially increased and demand is increasing."

Commercial disputes coming up in future in Chicago may be kept out of the courts of law if a "trade court" recently established there by the Chicago Association of Commerce can bring about satisfactory adjustments of differences. The new commercial tribunal, the first of its kind established in America, will concern itself chiefly with infractions of a commercial nature, where fact is of more importance than details of the written law. It is modelled largely after similar institutions in Europe which are said to have served successfully in the adjudication of business disputes in continental countries. The first case was brought up in the "trade court" May 4. It had to do with a dispute over 2,000,000 folding cartons, which were ordered from the O. B. Andrews Company, of Chatanooga, Tenn., by the Universal Theatres concession Company, of Chicago, and which the latter firm refused to accept, because they were not according to the sample. Charles W. Bell, assistant secretary and N. E. Feller, a salesman, represented the O. B. Andrews Company at the hearing. Decision in the case was reserved. J. Kent Greene, formerly assistant to Chief Justice Olson, who acted as manager of the commercial arbitration bureau, presided at the hearing. Much interest in the procedure is being taken by Chicago business men.

A deal consummated at Monroe, Michigan last week brought about the consolidation of the Monroe Binder Board Company and the Boehme & Rauch Company. The concern, to be known as the Monroe Consolidated Paper Company, is capitalized at $7,500,000, of which amount $5,000,000 is common stock. E. C. Rauch, founder of the Boehme & Rauch Company, was elected president, and L. W. Leathers, Eugene C. Betz, J. C. Bullis, F. E. Williamson and H. L. Rauch, vice-presidents.

Proclamations designating the week of May 22 as Forest Protection Week were issued last week by President Harding and by Governor Miller of New York State. Governors of the various States are asked by the President to arrange educational and instructive exercises to place before the people the need for preventing unnecessary waste by forest fires. Governor Miller asked the people to "create universal appreciation of the worth and importance of our forest heritage."

W. B. Greeley, chief of the United States Forest Service, appeared before the House of Representatives' Territories Committee last Friday to urge the necessity of vigilantly protecting the pulpwood and power resources of Alaska to prevent reckless exploitation. He said that the Government's conservation and development program might be frustrated by passage of the Sutherland bill which would transfer to a commission of Alaskan residents many of the Governmental functions. He expressed his belief that the forests of Alaska provide a practical solution of the wood pulp problem.

The Commercial Advertiser Association, publishers of the New York "Globe," has begun a damage suit in the Federal courts against the International Paper Company, alleging loss of circulation and advertising, due to violation of the Sherman Anti-Trust Law by the defendant firm. The plaintiff charges that in 1915, 1916 and 1917 it lost amounts set at $500,000, by reason of the formation of a newsprint manufacturers' association in restraint of trade. The complaint states that the Commercial Advertiser Association had to buy paper from the company and names forty-three companies producing paper with which it alleges the plaintiff was not allowed to do business.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, May 14.—Speculation is rife as to the effect on the trade and the operating pulp and paper companies of the strike of pulp and paper makers in such mills as the Spanish River, Abitibi and St. Maurice companies and the concensus of opinion appears to be that the net standing of the companies will not be seriously affected because it is known that production was speeded up for some weeks ahead in anticipation of a strike contingency. The wide-spread strike among pulp and paper makers across the line is also spoken of by some as likely to have a favorable effect on the Canadian market as it will curtail supplies in the States and thus create further demand for the Canadian product. This, however, is contingent upon the extent to which the labor unrest extends in this country. While the industry as a whole is unsettled it is still prosperous as indicated by the statements of some of the leading companies such as Price Bros., this company having shown profits of $1,134,450 for the four months operations as against $2,055,782 for the previous full year. Current busines, both in pulp and paper is quiet and the market in paper is still on the down grade. Several lines of paper underwent a further decline in price last week, including coated paper, wrapping, tissues and toilets. There is little indication of the pulp market increasing in activity and few transactions are taking place, while stocks are increasing at the mills.

PULPWOOD.—Although pulpwood contractors are still buying wood, no prices have been established and there is practically no real market. A leading Toronto contractor, who has just returned from a trip to New York and Northern Pennsylvania says that he never saw the pulpwood situation in such an indefinite shape, either in the States or in Canada. In the two states he visited he did not find a single mill that was running full and many of them are closed entirely. In Canada very few mills are in the market for pulpwood, although some contractors, while doing a great deal less business than last year, have considerable orders booked for 1921-22 delivery, although the orders are being taken on the basis of a non-established market. Prices are down at least twenty-five per cent from those of a few months ago and while the pulpwood industry generally is dull there are signs that it is coming back. The contractor referred to above states that he looks for very much better business very shortly and predicts a spirited revival in trade as soon as the labor problem is settled and the market becomes firmly established again. Regarding the pulpwood situation in Quebec, it is stated that it is in strong hands, however, and that there is little danger of it being forced onto the market at a sacrifice. So far there has been no disposition on the part of those controlling the wood to force its sale, which is a matter of satisfaction to the dealers.

WRAPPING PAPERS.—With buyers of wrapping ordering 500 pounds whereas they used to order by the ton, and with a fairly free flow of small orders coming in the wrapping paper jobbers do not know just where they are at as regards business turnover, for while the orders are smaller there would appear to be a better margin of profit on the smaller orders than on the large. A fair amount of business is being done and when the total tonnage for the past few months is ascertained, it is thought that the wrapping paper trade will be found to have weathered the depression period very well. None of the jobbers are taking any chances in stocking up and the consumer is following the same policy, the result being that the mills are having a rather hard time disposing of their output. The light stocks being carried by the jobbers is indicated by the enquiries among the jobbers themselves for odd lots to fill up orders. Just as the jobbers get no protection in the buying of car lots so do the consumers hesitate about buying in anything but small lots in the present state of the market, which is a declining one. A cent a pound was knocked off the price of several lines last week. Grey brown wrap now sells at $5.50 in car lots, f.o.b. Toronto: white wrap 6 cents per pound and No. 3 manila $6.50. Fibres and kraft remain unchanged.

KRAFT.—The improvement in trade in this line, reported during the past few weeks, continues, and dealers and manufacturers are cheered at present conditions and future prospects. The trade generally feels that an era of better business is setting in and sales during the past few weeks have been increasing satisfactorily. Kraft paper is still quoted at 10c and kraft pulp at $80 per ton.

COATED PAPER.—Prices for coated paper at the present time are being fixed to suit the conditions and there is no stable market as far as prices are concerned. One mill dropped its price a cent a pound on May 1st and other mills either have made, or likely will make, a similar reduction. Although the coated paper mills have been enjoying a fairly prosperous season despite the paper trade depression, business is now fluctuating considerably and some of the mills report trade rather dull. A lot of enquiries, however, are coming in, and although they do not all result in business, the trade on the whole continues to hold its own very well.

TISSUES AND TOILETS.—The light weight paper market continues to decline, reductions being made a few days ago in both tissues and toilets. Toilets went down fifteen per cent and tissues underwent a slight reduction. The following prices for leading lines of tissue now prevail: No. 2 manila, 24x36-480, $1.30 per ream to jobbers in quantity—$1.75 for less than 50 reams: 20x30, 95 cents and $1.30; white cap or natural white tissue, 24x36-480, $1.50 and $2.00: 20x30, $1.05 and $1.40; No. 1 bleached white tissue, 24x36-480,$1.95 and $2.60: 20x30, $1.40 and $1.85: No. 1 manila or natural white sulphite tissue, 24x36-480, $1.75 and $2.35: 20x30, $1.20 and $1.60. All prices are f.o.b. paper delivery points and according to the rule adopted some time ago all quantities must be in one shipment to one party, at one time to one place.

RAG AND PAPER STOCK.—Paper manufacturers have continued uninterested in offerings of cotton cuttings and very little business is being done. The mills in the New England states have been quoting

lower prices than dealers can possibly afford to sell at. Most mills state they have sufficient rags on hand to meet their immediate requirements, and remain uninterested in any offerings of respectable size. No. 1 shirt cuttings have been offered in some cases as low as 9 cents, but in most cases a half to a quarter of a cent more has been demanded by packers. Nothing has occurred to lift the gloom from the old cotton rag market. Transactions with mills have been few, and have not involved any large turnover of stocks, so that a few dealers in order turn over merchandise, have not been averse to granting some concessions. Dealers claim that prices are about as low as they can possibly get and the general opinion is that when mills are again purchasing, prices will have to go up on most grades. In this connection it is interesting to note that the United States Federal Trade Commission repors for March show 440.777 tons of paper, indicating that mills were operating at 76 per cent of this average for the past three years, and also showing the first upturn since production started to decline in that month.

WASTE PAPER.—The waste paper market has gained a little further in activity, particularly in mixed papers, and slightly in book stock, and it has gained considerably more in sentiment. In the first place dealers and packers cannot see how the market can go down much further, The amount of stock being packed has fallen off tremendously, and there is a great deal more stock being destroyed because of the low market price. It is stated that hundreds of tons of paper is being destroyed every day, most dealers refusing to pay anything whatever for ordinary scrap paper as the price being paid by the mills is so low that it is eaten up entirely by the cost of handling, cartage and freight. This is particularly true where the mills are some distance from the supply point and the freight rate is an important factor. Some of the American mills have increased their price for mixed papers two dollars and three dollars per ton during the last ten days. Dealers now feel that any buying action on the part of the mills will increase the price of all grades of waste paper quite a good deal. A few weeks of active operations by the mills will clean out the entire visible supply of waste papers, and unless the mills soon adopt a more intelligent policy of buying, the dealers say they will find that they will be the sufferers when they really require the goods. "The waste paper that is now being burnt and destroyed is lost forever," said a Toronto dealer, "and the mills have only themselves to blame if a revival of business finds them understocked and forced to pay increased prices for material."

The following prices for rags and waste papers are reported:—

	Per Cwt. f.o.b. Toronto.
No. 1 shirt cuttings	$8.75— 9.50
No. 1 unbleached cotton cuttings	5.50— 6.00
No. 1 fancy shirt cuttings	6.00— 6.50
No. 1 blue overall cuttings	6.00— 7.00
Bleached shoe clip	8.00— 8.50
White cotton hosiery cuttings	8.75— 9.50
Light colored hosiery cuttings	9.00—10.00
New Light flannellette cuttings	8.00— 8.25
No. 2 white shirt cuttings	5.50— 6.00
City thirds and blues (repacked)	1.30— 1.40
Flocks and satinettes	.70— .80
Tailor rags	.60— .65
Gunny bagging	.80— .90
Manila rope	2.75— 3.00
No. 1 white envelope cuttings	2.50— 3.00
No. 1 soft white shavings	2.25— 2.50
White blanks	1.40— 1.50
Heavy ledger stock	1.50— 1.75
No. 1 magazine	1.40— 1.50
No. 1 book stock	1.00— 1.20
No. 1 manila cuttings	1.50— 1.60
No. 1 print manila	.70— .80
Folded news	.50— .60
Over issue, news	.75— .90
Kraft	1.40— 1.50
No. 1 clean and mixed papers	.30— .40

NEW YORK MARKETS.

New York, May 14. — (Special Correspondence). — On the whole business of fairly good volume has been transacted in paper this week. The market is still far from normal, as consumers of all kinds of paper are purchasing almost solely against direct requirements, yet demand continues to gradually broaden and the situation seems slowly though steadily improving. The trade is now speculating as to when demand for paper will open up in something approaching normal proportions. There are many who express the opinion that activity in the market wll not revive in full measure before well into the fall, whereas others take a more optimistic view and are of the belief that demand will considerably expand along about August or at least by the first part of September. Those who hold the latter opinion base their ideas on the fact that buying of paper of practically every description picks up in the Autumn and who therefore expect that publishers and printers and other consumers in a great many instances will come into the market earlier this year than usual to lay in stock for fear that if they wait until later in the year that a general buying movement will force prices higher. It is commonly felt among paper jobbers and distributors that prices will have touched rock bottom by August and it is believed that buyers will appreciate that holding off further will avail them nothing in the way of additional saving in purchases after that time, so that it is expected a good percentage of consumers will then come into view to acquire supplies. If this theory works out, it will mean that trade in paper will be of larger volume in the latter part of this summer than is ordinarily the case and that mills will experience a substantial improvement in demand for their product earlier than probably some of them now look for.

More newsprint mills closed down this week as a result of additional operatives joining the strike of pulp and newsprint mill workers. It is estimated by the operatives' union that upwards of 15,000 men are now on strike, and it is stated that manufacturers are making no effort to run their plants with other men. Certain of the newsprint mills have renewed their contracts with the labor union and are operating without interruption, but it is variously estimated that production of newsprint at present is no more than between 30 and 50 per cent of normal. The strike situation has created a still firmer tone to the market. Publishers are proceeding cautiously in absorbing additional supplies of newsprint but most of them are looking around the trade and are acquiring such lots of paper as are to be found at what are considered reasonable market prices. No more newsprint is being offered at so-call-



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ed distress prices, and buyers find it imperative to meet recognized market levels to get supplies. The strikers claim that the shutdown of mills is aimed not at them but at the paper market, but this appears hardly true because the average manufacturer of newsprint has no excessive stock of his product on hand today. Virtually all of them have stock, of course, but indications are that the great bulk of surplus newsprint is in the hands of publishers rather than mills.

Spot quotations on newsprint in standard rolls range between 5.50 and 6 cents a pound at mills, and those manufacturers affected by the strike are mostly refusing to quote to the transient trade while conserving such supplies as they have to take care of contract customers' wants. The market tone is distinctly firm and there appears scant doubt that if the shutdown of mills continues a few days longer that prices will respond by moving upward.

Mill quotations on book papers are maintained but signs are not wanting that manufacturers are accepting orders in frequent cases at lower prices than they quote. Jobbers are being instructed to name any reasonable price to prospective buyers and then to submit their offers to mills, which are seldom turned back. This shows, of course, that manufacturers want business and that they are willing to produce on a very slight margin of profit so long as they can keep running. Around 7 cents a pound at mills is the average price named on machine finished book, with some transactions reported down to 6.50 cents.

Tissue paper quotations are steady at 95 cents per ream for No. 1 white and there is a moderate demand for high-grade tissues, while toilet tissues are moving in exceptionally good volume in comparison with other kinds of paper. Wrappings are in routine call and prices are at a basis of about 7 cents a pound on No. 1 domestic kraft. Fine papers show little change in price, and the manufacturing situation has not improved to any appreciable extent. One reason for this is that a majority of mills are filling current orders from stock, present mill holdings of fine papers being larger than of any other class of paper.

Fair activity prevails in the box board trade. Quotations incline upward but no actual change of note has occurred. Plain chip is quoted by most mills at $30 a ton f.o.b. mill and filled news at around $35, but some manufacturers are booking orders at slight concessions from these prices.

GROUNDWOOD. — Inquiry for mechanical wood pulp is on the rise and quotations tend decidedly toward higher levels. Those transient buyers who usually depend on pulp mills which are closed down, because of the strike for ground wood are looking about the market in search of new sources of supply, and although no large tonnage orders have been reported placed, the situation generally shows increased strength and the market is certainly working into a firmer position. Domestic grinders are quoting between $30 and $35 a ton at pulp mills for spruce ground wood of prime quality, with some unwilling to sell any sizable amount of pulp at these figures, yet Canadian producers are moving at least a part of their output at as low as $25 a ton f.o.b. pulp mills. With newsprint mills shut down, consumption of ground wood obviously is greatly reduced, but on the other hand, the fact should not be lost sight of that a good many grinding plants also are down, thus decreasing the production of pulp.

CHEMICAL PULP. — There is still a lack of important demand for the higher qualities of chemical wood pulp, such as bleached sulphite and soda fibre. Those grades produced by mills affected by the strike of pulp and paper mill operatives, however, display a stronger price tone under a gradual increase in inquiry from consuming quarters. Newsprint sulphite is firming, and bids of $70 per ton are being freely refused by domestic manufacturers, asking prices on this kind of pulp ranging generally from $75 upward. Kraft seems a little stronger in tone also, with 3.75 to 4 cents a pound mostly asked by mills although now and then a sale is reported at lower levels. Quotations of the leading producers of bleached sulphite are maintained at 6.50 cents per pound at mills, but those manufacturers offering sulphite at cheaper figures are getting most of the transient business at present. There is nothing of note doing in the foreign pulp trade and prices are largely nominal and on a broad and irregular range.

RAGS. — Paper mills continue to keep out of view as buyers of rags and the market for this commodity is in a dull condition. Roofing rags are moving comparatively well but other grades are more or less dormant, writing paper manufacturers showing practicaally no desire to absorb supplies. Dealers have found that low prices attract few buyers and are consequently endeavoring to sustain quotations and are not pressing matters. Asking prices on old No. 1 repacked thirds and blues around 2.25 cents, on new No. 1 white shirt cuttings around 10 cents, on washables around 5.25 cents and on blue overall cuttings around 6.25 cents, but buyers can no doubt secure at least some of these rags at lower costs. Roofing stock is

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PAPER STOCK.—Certain grades of old paper are firming in price under a little better demand from consuming quarters, this being attributed by most members of the trade to the shutdown of pulp mills and the resultant need of papermakers for larger quantities of waste paper. No. 1 soft white shavings are quoted at an advance at about 2.25 cents a pound f.o.b. New York, with some dealers disinclined to take orders at this basis owing to the upward trend of packers' prices. Old kraft paper is firmer at around 1.50 cents per pound, and white news cuttings are scarcely to be had at less than 1.40 cents at shipping points. Books are quotably steady at 90 to 95 cents a hundred on No. 1 heavy flat stock, and ledgers and writings are held for about 1.75 cents a pound. Folded newspapers in New York are selling to mills at 35 to 40 cents a hundred and No. 1 mined papers at an average of 25 cents, but higher prices are reported ruling in other parts of the country.

OLD ROPE AND BAGGING. — Old Manila rope holds steady in price at about 4 cents per pound at shipping points and is moving in fairly good amounts. Bagging is in dull demand and quotations are unchanged at former nominal levels.

CANADIAN MARKET FOR HEAVY CHEMICALS.

Everything in this line is very quiet at present, so many mills being shut down, or run on short hours, especially is this the case for all chemical supplies in the pulp and paper industry.

ALUM is quoted at 5½ to 6 cents, and there is very little demand.

BLEACH is quoted in the neighbourhood of $3.50 per 100 lbs., though with very little activity, as most of the mills are supplied on a contract basis.

SODA ASH, in carlots, is around 3 cents.

CAUSTIC SODA is 5 cents, Granular 5¾ for less than carload lots, with a price of about one-quarter of a cent less for carlots.

There is practically no spot market activity in these lines just now.

A BUSINESS BAROMETER.

Mr. James W. Sewall, forest engineer and timber cruiser, with offices at Washington, O.C., Old Town, Maine, and Sanford, Florida states that hitherto the intensity of demand for services such as he offers, has fluctuated with the rise and fall of business in the lumber and pulpwood circles. For a period of years back he has felt acutely the rising activity or waning strength of the lumber market, and as a rule the demands or lack of demand for his services have preceded slightly the general apparent trend, just as stock market prices are apt to discount futures. With these past facts in mind he feels reasonably optimistic as to the comparatively near future ,as quite a quickened call for estimates and working plans is making itself felt, in distinct comparison with the period commencing early last autumn and lasting through most of the winter, when new orders were scarce and the Sewall crews were kept busy mainly on work already started.

His work now in process and definitely decided upon covers an area of over 1,400,000 acres, but Mr. Sewall says that his organization and system are now so well developed that calls on his personal energy are far less than they were 15 or 20 years ago, when he started in with one or two men and did his own cooking.

H. S. TAYLOR RETURNS.

We wish to announce the return of Mr. H. S. Taylor to Canadian fields of work. Mr. Taylor has opened up an office at 302 Guarantee Building, under the name of H. S. Taylor, Limited, the firm carrying on the design, construction and operation of pulp, paper and fibre mills, together with hydro-electric developments and steam power plants.

Mr. Taylor was, for a number of years, with Geo. F. Hardy, New York City, and later was Chief Engineer of The Spanish Pulp and Paper Mills, Ltd. In 1919 Mr. Taylor formed the Management Engineering and Development Co., of Dayton, Ohio, being General Manager and Chief Engineer of this organization and the great success of this Company is shown by the number of successful installations completed. Mr.



HOWARD S. TAYLOR.

Taylor will retain his connection and present position with the Management Engineering and Development Co.

Mr. Taylor feels that hs is at home in Canada and wishing to be in close touch with the Canadian Pulp and Paper Industry, has opened up an office in Montreal, and will have a most efficient organization at the disposal of the Canadian manufacturers and we trust they will avail themselves of this service.

Mr. Taylor has many fiends in the Canadian Pulp and Paper Industry who, we know, will extend a hearty welcome and we only hope they will make 302 Guarantee Building their headquarters when in need of engineering, design, or consultation for their mills.

EASTERN EQUIPMENT CO., LTD., have moved from the McGill Building and taken the entire floor of 234 Beaver Hall Hill, Montreal where they will have, in addition to their offices, an extensive show room. This firm have recently been appointed Canadian agents for St. Clair Brothers, Galt, Ont., manufacturers of pumps, concrete mixers, hoists, etc. They also handle new and rebuilt contractors' equipment of all kinds as well as locomotives.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., May 26th 1921. No. 21

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press. Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

Subscription to any address in Canada, United States and British Empire, $5.00 yearly. Other Countries Postage Extra. Single copies, 15 cents.

Changes of advertisements should be in the Publishers' hands ten days before the date of issue.



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EDITORIAL

HOW MANY FIRES THIS YEAR?

With the time for the spring drive approaching, and in a season which is already remarkable for the rapid approach of warm weather, we are likewise closer than usual to the time of greatest fire hazard. Not only has the early spring brought the litter on the forest floor to a drier condition than is usual at this time of the year, but the sunny days have already started the exodus of fishermen to the woods. The menace to the forest is very largely due to the carelessness of these occasional visitors and to the occasional carelessness of the hardened woodsmen and river driver. In spite of the increasing amount of attention that newspapers are giving to the necessity for protecting our forests from fire, in spite of posters liberally exhibited at strategic points in the forest, in spite even of personal appeals from forest rangers and others, there are still some people who are blind and deaf to warnings, who are insensible to appeals, but who thoughtlessly and carelessly persist in building camp fires too large, in leaving embers unextinguished, in throwing away lighted matches, pipe ashes and cigar butts, and even to operate locomotives without spark arresters, and start brush fires when every condition favors the spread of the flames to the forest. Many of these careless and thoughtless people, because they have not actually invested money in the purchase of woodlands, fail to realize how dependent they are for their jobs on the forest and the industries which it supports. The holiday fisherman and gamester cannot carry on his business at home without paper, the settler cannot build his house or buy farming implements except for lumber and other wood products, the lumberman and log driver would surely be out of a job if there were no forests, and there would be far less freight for our railways were there no requirements that wood and other raw materials be brought to our pulp and paper mills, and other wood using plants and finished products hauled away from them.

The Governments of our provinces and individual companies are co-operating in the expenditure of many thousands of dollars to protect the forest from fire. Their work is mostly a brave effort to prevent small fires from becoming widespread disasters. Recently the ranger has become more of a co-operating official since more sensible and drastic laws have been passed requiring that permits be obtained for the burning of brush by settlers. This law alone has saved millions of cords of wood to the Province of Quebec and will be equally efficient in other provinces where similar measures are being undertaken. This degree of co-operation is far from being adequate to meet the full situation. The ranger is still too much like the physician who is only called when disease has gone too far. The more enlightened idea which is now gaining ground for maintaining health instead of curing disease, must be applied to our forestry situation where, instead of endeavoring to extinguish fires, we must succeed in preventing them. Very few fires occur because of spontaneous combustion and strokes of lightning but by far a greater number are caused by the carelessness of individuals. The problem is one which calls for the self appointment as an assistant ranger of everybody who goes into, or near the woods. It means eternal vigilance with regard to fire and a feeling of personal obligation and responsibility. It is a difficult matter to trace, arrest, and prove guilty, a person who has started a forest fire but it is an exceedingly simple matter for every person who goes into the woods to prevent a fire from starting. It does not cost a single cent to extinguish a camp fire, a cigar stub, or a match. It costs only a thought and yet such a thought will save thousands of dollars and will re-act on the thinker by maintaining in a protective state, a growing forest which is a source of revenue to the province and consequently a saving of taxes to the individual. Governments must be paid for and the wise individual will let nature do it for him.

The forests of Quebec Province alone provided an income in 1919 of 15 per cent of the revenue of the province. With proper attention they will do better than this but to do so they must be protected and the chief enemy is fire.

A MESS OF POTAGE.

Most people are familiar with the story of the Hebrew who sold his birthright for a square meal. It appears that he got a square meal but not a square deal. He obtained a temporary advantage at the expense of a permanent position and life-long inheritance. He did not get his money's worth, putting it into present day language.

The people of Canada are in the position of Esau; they are selling their birthright and an unsurpassed inheritance to Nature's wealth for the temporary advantage of a few dollars in present day profits. It is not necessary nationally or individually to sell this inheritance and even where the argument of international friendship and co-operation supports the export of pulpwood there is an equally strong but less frequently heard argument that those who benefit by the trade should pay something towards maintaining the estate.

On another page is a letter from our friend Barnjum

which relates to this subject. Mr. Barnjum and the editor do not agree on every subject, we are frank to admit, and it should also be said that, like the co-ed. in the college song who could not be "a son of the institute", so the editor cannot be strictly called a "Good Canadian" because of being a citizen of the United States. It is, however, possible to consider this question entirely apart from national allegiance. Without any question the biggest problem connected with the administration of Canada's forests, is the protection of the present growth and the insurance of reproduction of the supply. Of practically co-ordinate importance but necessarily secondary in point of accomplishment is the re-establishment on a productive basis by reforestation of appropriate areas so as to provide for the enormous demands that are absolutely sure to come within the experience of even the present generation. Proper administration of Canada's forests will necessarily require far greater appropriation than present expenditures, but every dollar that is properly spent on the forests will yield a good dividend. The person who buys timber from the Government through the licensing and cutting of wood from crown lands pays a fee which goes largely back to the forest in administration and protection costs. The man who buys wood cut on other lands pays nothing in this way for the protection and reproduction of the very material his own industry depends on. In other words, he is living on the output of a natural industry and plant on which he pays no insurance. Most of the pulpwood so disposed of is exported and furnishes the necessary raw material for about 20% of the pulp making industry across the line. The pulp and paper industry of Canada contributes generously both in the payment of dues and by continually co-operating in the protection and the up-keep of these forest resources. It is only fair that others who profit from the fact that Canada has these resources should also pay a share of their insurance.

As a matter of fact the time can be seen coming when other raw material will largely replace wood as a source of paper making fibre. Since the industry in Canada, not to mention that in the United States, is almost entirely dependent upon wood and since neither of these countries is naturally fitted for the production of these other fibres, it is necessary that every possible step should be taken to conserve present supplies and provide for future growth. To do this requires money and the levying of an export tax on pulpwood seems to us to be a fair and reasonable means of producing revenue which could be applied to maintenance of the forest and which at the same time would give a fairer distribution of such costs.

SAMPLING PULP.

In this issue will be found an address of the subject of testing pulp for moisture and the discussion of the paper by the Technical Section and the British Paper Makers' Association. The paper contains a number of suggestive thoughts which should be carefully considered by those who are engaged in the manufacture of pulp for export to Great Britain. It is pleasant to read the complimentary reference to the Canadian industry but there does not seem to be any suggestion of enlisting the co-operation of the Canadian mills in arriving at a standard method for procedure. The members of the Technical Section who took part in the discussion seem to consider Scandinavia as the only important source of pulp. It is true that the northern European countries have been furnishing most of the British mills with their pulp supplies but there are some in Canada who feel that this is not a permanent arrangement. If anything co-operative is to be done along this line it would seem like a good plan to give Canada a seat at the table. The sampling of pulp is a very vexing problem which should be given the best attention in a joint attack, by all those interested in the matter.

COBWEBS.

We read with some surprise, the statement made by a leather man in Montreal, that "the kid industry in Canada is still in its infancy."

There are not so many "Trade Inquiries" in the Weekly Bulletin of the Department of Trade and Commerce as we used to see a year ago.

Canada buys $3,000,000 worth of sisal grass for binder twine, of which $2,000 is from Jamaica. An increase in the proportion from this island would greatly improve our market for manufactured goods there, would keep our money in the Empire and slightly improve our trade balance elsewhere.

In the fiscal year ending April 1st, 1921, Canada imported $1,807,330 worth of advertising pamphlets, etc. and $977,905 of text books ($530,992 from U. S. and $316,448 from U. K.)

Since 1917 the part of Canada's exports going to the United Kingdom, has fallen uniformly from 64 to 27 per cent. of the total, while it has increased to the United States from 25 to 46 per cent. and to other countries from 11 to 29 per cent.

It was quite a shock to learn that Canada imported more than *fifty-seven million dollars worth* of wood, wood products, and papers (including printed matter) in the last fiscal year. This is twenty per cent. of the value of exports derived from the forest, which included pulpwood worth $21,513,594. Imports of paper and the like amounted to twelve and a half million dollars.

Lt.-Col. Thos. Gibson, Vice-President of the Spanish River Pulp & Paper Mills, Ltd., stated that, so far as he knew, there was no sign of settlement in the strike of pulp and paper mill workers, which has been in progress since May 12.

The Testing of Wood Pulps

G. H. GEMMELL, F.I.C.

The very large number of claims for excess moisture, or more correctly, short weight, on deliveries of wood pulp, during the past two years, renders it unnecessary for me to apologise for again introducing a discussion on this well worn subject. My experience tells me that there is dissatisfaction on both sides. On that of the makers of the wood pulp, who affirm that the claims are excessive and unjust, though they take the greatest possible care to see that the deliveries are sent out of correct weight. Also on the part of the buyers, because of the annoyance and trouble of making these claims and tests, and the feeling that the seller is deliberately sending deliveries forward short weight. There is also the face that not unfrequently, after one or two tests by their own chemists, where short weight is found, the officially appointed analyst certifies correct weight, or overweight, of pulp.

A movement is on foot, on behalf of the sellers, at the present time to amend the Wood Pulp Contract Note, and it is with a view of arriving at a more certain and accurate method of testing that I am makng this contribution to the first conference of the Technical Section of the Papermakers' Association of Great Britain and Ireland.

I want in the first place to make it clear that I hold no brief for the papermaker, and that most of the views stated herein have been already expressed to the pulpmakers, or their representatives.

During the past twelve months, I have made tests of wood pulp in presence of five representatives from the Continent, one at the port of delivery, the others at paper mills. In one instance, a duplicate sample was sent to the makers of the pulp. In the others, at my request, the representative accompanied me to my laboratory, and saw the samples weighed and dried. In none of these cases was any exception taken at the time, or subsequently, to the methods adopted.

One point which has been particularly emphasised is, that any error in the test is primarily due to the selection of the bales. and my experience tells me that this is the weak point in the present method of testing wood pulp. The "Official" wedge method of sampling leaves little to be desired in the way of improvement if due care is exercised. We have records of a large number of duplicate tests made from the same bale by ourselves and mill chemists, and it is rare that the difference exceeds 0.1 per cent. I have occasionally had complaints from the mill that my test does not show so much excess moisture as the mill test, but when I know that these tests are often made by the store-keeper, or timekeeper, or office boy, I naturally take no notice of such complaints.

As I have frequently pointed out to representatives of the pulp makers, all causes of difference would be eliminated if bales were sent out uniform in weight and moisture, in accordance with the contract note, which they admittedly are not. Where you have a parcel containing thick and thin bales, moist and dry bales, heavy and light bales, the final result of the test obviously depends on the kind of bales selected, and on this matter the official analyst has not an entirely free hand. Theoretically, he is entitled to choose any bale he desires, but in practice he cannot always do so. On arrival at the paper mill he may find a stack of from 3,000 to 5,000 bales. This stack has taken a week or more to build up. Obviously then, he cannot have the stack taken down and rebuilt, so that he may select bales from all parts of the cargo, but must select them from on or near the top. He will then get an undue proportion of bales from one part of the cargo, which may be wetter or drier, heavier or lighter than the average. If there is a variation in the size of bales, he can by inspection approximate the number of thick and thin bales, and sample bales in proportion.

As indicative of variations normally met with, the following are taken from our books of a cargo of pulp delivered to three mills:—

Mill.....	*A.*	*B.*	*C.*
Number of bales sampled	40	30	16
Of which *Light* bales	39	17	7
" *Heavy* "	1	13	9
Wgt. per bale invoiced (lbs.)	280 lbs.	280lbs.	280 lbs.
Average Gross wgt. per bale	275.7 lbs.	277.7 lbs.	279.2 lbs.
Excess Moisture (over 10%)	4.31%	3.49%	4.88%
Air-dry weight per bale	263.8 lbs.	267.9 lbs.	265.5 lbs.

Individual Test of 10 Bales (5 sheets from each dried.)

Bale No.	*Wgt. of Bale* (lbs)	*%Dry Pulp.*	*%Moisture.*	*%Air-dry Pulp.*	*%Excess Moisture.*	*Wgt of air-dry fibre per bale.*
1	319	88.45%	11.55%	98.28%	1.72%	313.5lbs.
2	318	87.45%	12.55%	97.16%	2.84%	308.9 "
3	311	79.31%	20.69%	88.12%	11.88%	274 "
4	313	85.32%	14.68%	94.80%	5.20%	296.7 "
5	310	85.72%	14.28%	95.24%	4.76%	295.2 "
6	316	85.79%	14.21%	95.32%	4.68%	301.2 "
7	325	74.18%	25.82%	82.42%	17.58%	267.8 "
8	328	88.84%	11.16%	98.71%	1.29%	323.7 "
9	311	85.05%	14.95%	94.50%	5.50%	293.9 "
10	312	81.15%	18.85%	90.17%	9.83%	281.3 "

Test From the Same Cargo, at two Mills, in Presence of Representative from Scandinavia.

Mill.....	*A.*	*B.*
Number of bales sampled.....	25	18
Of which *Light* bales.....	22	8
" " *Heavy* "	3	10
Weight per bale invoiced.....	288 lbs.	288 lbs.
Average gross weight per bale.....	277.1 "	281 "
Excess moisture.....	7.91%	4.8%
Air-dry weight per bale.....	255.2 lbs.	267.5 lbs.

It is frequently noted that a light or thin bale is also a moist bale, though this is not always so. A particular brand of pulp, of high grade, which is usually delivered correct weight, was, during a period of some months delivered short weight, and numerous claims were made. At one test, I particularly noticed a vari-

Tests of a Cargo of Pulp, Sampled in Presence of Representative from Scandinavia.

Sampled at	Docks	Docks	Paper Mill.
Number of bales sampled.	40	40	36
Of which *Light* bales.....	13	14	4
" " *Heavy* ".....	27	26	32
Weight per bale invoiced.	373 3 lbs.	373.3 lbs.	373.3 lbs.
Average gr. wgt. per bale	374.9 "	374.6 "	378.75"
Excess moisture.....	2.99%	3.23%	2.1.%
Air-dry weight per bale..	363.7 lbs.	362 5 lbs.	370.7 lbs.

ation in the size of the bales, and selected a thick and a thin bale for individual tests, with the following results (5 sheets per bale dried) :—

	Light Bale (Thin)	*Heavy Bale* (Thick)
Weight per bale invoiced.....	444 lbs.	448 lbs.
Gross weight of bale.....	444 "	466 "
Percentage of Air-dry pulp.....	94.98%	102.48%
" " Excess moisture.....	5.02%	2.48% fibre
Air-dry weight per bale.....	421.7 lbs.	477.5 lbs.
Weight, light or heavy.....	26.3 " Light.	29.5 " Heavy.

I should like to remark here that certain brands of pulp which we test are invariably delivered of correct weight, whilst others, though short weight, are more uniform, both as regards weight per bale and moisture contents. The result of this is that duplicate tests at different mills give results very close to each other. Example :—

Mill.....	*A.*	*B.*	*C.*	*D.*
No. of bales sampled.	25	25	25	25
Ofwhich *Light* bales..	2	3	0	1
" " *Heavy* " ..	23	22	25	24
Aver. gr. wgt. per bale	459.9 lbs.	462.0 lbs.	466.7 lbs.	464.3 lbs.
Excess moisture.....	1.18%	1.6%	2.22%	1.23%
Air-dry wgt. per bale.	454.47	454.65	456.3	458.6 lbs.

Mill.....	*A.*	*B.*
Number of bales sampled.....	20	20
Of which *Light* bales.....	20	10
" " *Heavy* "	0	10
Average weight per bale.....	252.45 lbs.	278.5 lbs.
Percentage air-dry pulp.....	49.00%	44.38%
Air-dry pulp per bale.....	123.7 lbs.	123.6 lbs.

Parcel of Pulp Sampled in Presence of Sellers' Agent.

	Light Bales (under 364 lbs.)	*Heavy* Bales (over 364 lbs.)
Number of bales sampled.....	50	74
Average weight per bale.....	352.68 lbs.	378.08 lbs.
Percentage air-dry pulp.....	60.10%	55.70%
Air-dry pulp per bale.....	211.9 lbs.	210.6 lbs.

I could multiply the instances where, because of the irregularity of weights of the bales and the moisture contents, the result of two or more tests vary, whereas, in other cases, because of uniformity in weight and moisture, duplicate tests agree. When we know that in certain brands of pulp claims are rarely made, whereas in others there is always a claim for short weight, the inference is obvious, and the makers have no just cause of complaint. It must also, I think, be agreed that if anyone stands to lose on the transaction it is the paper maker. As the result of an official test, the pulpmaker is paid for the air-dry fibre he delivers, but if no test or claim be made, he may be paid in part for water instead of fibre. I know of mills in Scotland who regularly receive pulp on which claims are made by others, yet who never themselves test their pulp. These cases are a clear gain to the pulpmaker. At one of these tests previously referred to, the representative present on behalf of the sellers was a chemical engineer, who was responsible for the packing of the pulp. When asked what was the reason why certain bales contained more moisture than others, he stated that the sheets in the moist bales were thicker than in the drier bales, and when run off the machine they were not dried so effectively. To determine whether this was so, we took 20 sheets from a moist bale and 20 sheets from a dry bale. The results were as follows :—

	Moist bale.	*Dry* Bale.
Weight of Bale.....	279 lbs.	276 lbs.
Weight of 20 sheets (moist).....	9.588 "	8.255 "
Weight of absolutely dry pulp.....	7.025 "	7.200 "
Loss.....	2.563 "	1.055 "
Percentage of moisture.....	26.75%	12.78%

It will be noted that, though the moist sheets were heavier than the dry sheets, they did not contain more fibre. The excess weight was due to water only.

It is the usual practice in Norway and Sweden to invoice, or, at any rate, to infer that the pulp contains 90 per cent. dry fibre and 10 per cent. of water, or, for moist pulps, 45 per cent. dry and 55 per cent. water. On a recent occasion, I made a test of a delivery of pulp and found an excess of water. The short weight was so large that I decided to exercise the option open to the analyst, to take a further sample in order to confirm the result. When the pulpmakers received the certificate, they wrote saying they could not understand why there was such a shortage, and that their chemist's test showed that the average air-dry test was 98 per cent., yet they had invoiced the parcel at 100 per cent.

Some **Canadian** pulps, and, before the war, most German pulps, had each bale legibly stamped and numbered, and also gave the weight and air-dry or bone-dry test per bale. Accompanying the parcel was also sent a specification of the bales and their contents. If the Scandinavian pulpmakers would adopt this plan, there would be fewer complaints of incorrect results from the choice of abnormal bales by the official analyst. The average weight and air-dry percentage of the whole parcel being known, the analyst could then take half the bales below and half above the average, or, if

needs be, at very little extra labor, sample and test individual bales.

I have thought of various plans for overcoming the difficulty arising from irregularity of the weight and moisture contents of the bales, and the above appears to me to be the most satisfactory solution for the analyst, as well as for the buyers and sellers, and I put this forward for the careful consideration of those to whom the amendment of the Contract Note is entrusted. In connection with this proposed amendment, I would also suggest that a small committee, consisting of representatives from the British and Scandinavian Wood Pulp Associations, the Papermakers' Association, and two or three representative official analysts, be appointed to draft the amended Contract Note, and submit to the two Associations.

In conclusion, I would briefly draw your attention to some of the points in the present Contract Note which I consider should be more clearly specified:—

Clause 3.—Packing and Weighing. "The pulp to be packed in bales of declared uniform weight, or a specification to be given stating the weight and number of each bale. . . ."

Is the analyst justified in rejecting abnormal bales? I believe it is the practice of some analysts to reject all bales 28lbs. over or under the invoiced weight. I can quite understand, and have frequently rejected heavy bales, because they showed evidence of external wetting; but if a light bale is intact, with wrapper, wires and number, on what grounds should it be rejected?

Clause 3, par. 3.—Intact Bales. "The samples to be drawn from accurately weighed and intact bales, as nearly as possible in the manner agreed upon by the British and Scandinavian Pulp and Paper Associations."

Some of my paper making friends have protested because we reject bales which have been wetted or otherwise damaged in transit. My contention is that the analyst should, as far as possible, select bales in the same condition as they left the pulp mill. To obtain an average sample is difficult enough under normal conditions, but it is far more difficult where damaged bales are to be included in the test. I would therefore suggest that the clause reads: "intact and undamaged bales."

Clause 3, par. 3 (last part).—"The analyst may at his discretion, within three days, test a further two per cent. of the parcel." This is not sufficient time, and I would suggest that at least five days' time limit be given.

Clause 8.—Time Limit. "All claims must be made in writing within 14 days after the delivery of the consignment at the consumer's mill, wharf, or station in the United Kingdom. . . ." Does this mean from the time the pulp arrives at the port of delivery, or begins to arrive at the mill or wharf, or after the whole consignment has been received by the buyer?

These may be looked upon as minor points, but if friction and unpleasantness is to be avoided, no effort should be spared to make the new contract note as complete and specific as possible.

DISCUSSION.

Mr. W. Bacon (Messrs. Sindall & Bacon), as an official analyst, sympathised with Mr. Gemmell in his trials and tribulations. One point he wished to raise referred to the selection of bales. The case cited by Mr. Gemmell, of 20 sheets from a moist bale and 20 from a dry bale, gave an illustration of the actual variation that took place in one shipment of sulphite pulp, and he could endorse that statement, namely, 26.75 per cent., as against 12.78 per cent. Undoubtedly, wedges taken of equal superficial area must have quite a different volume, owing to the increase of thickness due to the difference of moisture. Of course, Mr. Gemmell would make allowance for that in an ordinary test. With regard to the question of specification, there was no question of doubt about it, that this system was the only scientific, as well as the commercial way, in which pulp should be bought and sold. For their part, they had again and again tried to get mills to adopt this system, and they had even drawn up an actual scheme for their guidance in Scandinavia, with this object in view, but nothing up to the present had been done. Mr. Gemmell spoke about the Konigsberg pulp. He forgot whether they originally made their bales up to uniform weight, or whether they made them of varying weights; in any case, since the war, they had adopted the system of uniform weight, namely, 200 kilos per bale. If the Scandinavian firms follow the same lines, and generally they do so, they would still be in the same hole, for undoubtedly their weight did vary enormously. Recently he had a shipment of stuff to examine, and he found a variation of 3cwt. 3qrs. 27lbs. down to 3cwt. 0qrs. 10lbs. for bales of supposed uniform weight. The mill made an objection that he should take the heavy bales. Mr. Gemmell raised the point that some chemists allowed 28lbs. either way. They (Messrs. Sindall & Bacon) did not go on that minimum weight at all. If there were a number of bales over weight, obviously they must come into the test, because they were out of the parcel. In the same way, when they had light bales, if they had one 340lbs. and another weighing 360lbs., that was part of the consignment, and it was only fair to the buyer that it should be protected, and that it should come in as part of the test. They had one modification with regard to that; in a test they were doing there were 50 bales (going back to a specific test). If, in a particular test, only that one bale showed 3cwt. 2qrs. 27 lbs., and all the rest were 3cwt. 1qr. 15lbs. or so, and if, on the examination of the stack he was of the opinion there were no other bales up to that weight, he should clearly look upon that as a "freak" bale, and would be justified in rejecting it. His remarks, as applied to the heavy weight bales, also applied to the light bales. Proceeding, he said another interesting point was raised in regard to the question of "intact and undamaged" bales. He quite agreed it would be very nice to have this term put in—"intact and undamaged"—but what would Mr. Gemmell consider an absolutely "intact and undamaged" bale? Supposing he had to carry out a test from 1,000 tons of pulp, and that pulp had been transhipped and put on rail and the whole parcel had some of the covers removed, would Mr. Gemmell consider them "intact and undamaged" bales. The Contract Note clearly stated that the stuff was "gross for net." Official analysts should be agreed upon what they should consider "gross for net." To his mind it was clear that the bale, on leaving the mill, had a certain weight; through transit it had lost a certain amount of pulp, and they should allow for what pulp had been lost in the way of wrappers. When they took into consideration that the normal wrapper of a bale weighed between four and five pounds, it was a serious item not to disregard that

loss of wrappers. So, if they had 6,000 bales of pulp, would Mr. Gemmell consider himself to be in a position to say a test could not be carried out because the pulp, no longer having a wrapper, was therefore not intact? If the words were put in, "Intact and Undamaged Bale," it might be difficult. The paper mill had got to undertake the work of testing, and an allowance for loss of wrappers should always be taken into account. It meant a loss, perhaps, but the test should be carried out on the lines of the Contract Note. He took it the task of the official analyst was to do the work as efficiently as he could. For that reason it meant either to pull the stack to pieces or the mill representative and the official analyst should be allowed to deal with discretion and agree between themselves as to the selection of bales and the allowance for loss that should be made. They had always tried to follow that out, and without exception they had always succeeded. Mr. Gemmell referred to the discretion of the analyst to take another test within three days. Regarding the three days as insufficient, Mr. Gemmell had suggested five days. They (Messrs. Sindall & Bacon) had never interpreted the Contract Note in that way; they had always interpreted it that the test must be carried out within three days of the expiry of their first test, and when they had had re-tests made—and they did occur sometimes—they had always succeeded in carrying their point. He agreed that such a matter should be mentioned in the contract. If they could agree, and get something put into the Contract Note, it would be valuable. Mr. Bacon added that he was in hearty agreement with Mr. Gemmell on the point he raised regarding the specification, which had a drawback. His firm had an enormous number of special pulp tests, and it was hard work sometimes to go to a mill and find that it was almost impossible to get the requisite bales to carry out the test, in that they failed to have indicated either their number or the percentage of air-dry or bone-dry pulp through the rubbing away of the details from the face of the bale by handling. It is a sore point with the paper mill people, because instead of taking half-an-hour it might take three or four hours to get the requisite number of bales and they might have to pull half the stack to pieces. The Nordeutscher had stuck inside the wrapper a square label with the number of the bales, boiling number, and the percentage of air-dry. If they could get the Scandinavian firms to adopt such a system, the lot of the pulp-suppliers' representative and that of the papermaker would be a happy one.

Mr. Mowat (Messrs. Peter Dixon & Sons, Ltd.) recalled that he had been looking through their list of tests, and he noticed that the chemist's tests from the duplicate sample did not correspond with the results that they obtained from the analyst. He noticed one case in particular, talking of sulphite, in which the mill chemist got 13.80 per cent. of moisture, while the analyst got 12.92 per cent. The next case was somewhat different. Their own chemist's test showed 12.27 per cent. of moisture, while the analyst's showed 10.73 per cent., clearly a case, he should say, where the analyst had failed to dry his pulp correctly. With regard to the point of light or thin bale and a moist bale, so far as mechanical was concerned, they always looked upon light bales as dry bales, and heavy bales as moist or wet bales. Another point, about the chemical engineer who visited this country. When he asked the reason why certain bales contained more moisture than others, he stated that the sheets in the moist bales were thicker than the dryer bales. Mr. Gemmell said it would be noted that although the moist sheets were heavier than the dry sheets, they did not contain more fibre; the excess weight was due to moisture only. The chemical engineer said the moist sheet was a thicker sheet, and therefore had got more fibre in it. As to the Contract Note, he thought they had better leave the Contract Note alone; he thought it was all right. They required a definition of an abnormal bale. Was an abnormal bale an isolated bale? Of coure, a representative sample must be drawn. Many a time they got abnormal or over-wet bales, but they were not wet as regards the parcel. Therefore the analyst required to take his representative sample. The whole cargo was the representative sample. The speaker went on to refer to the analyst's discretion to make a re-test in three days of a further 2 per cent. Three days were not sufficient. It was all right if they were working on a small parcel, but with a big parcel they required five days at the very least. As to where the consignment was to be signed. Mr. Mowat thought that this should be at the mill, and that was the alternation, he thought, one might make, but it was a minor point. After putting in a plea for the analyst, the speaker thought that all mills ought to have a scale or a balance that would weigh up to 14 or 28lbs., for the convenience of the analyst, so that he could weigh his sample before it left the mill. He thought that for all concerned, both the mill owners and the papermakers and the pulp agent, it was better that this should be done.

Mr. W. Edington Aitken (Messrs. Peter Dixon & Sons, Ltd.) mentioned that they had just had a delivery of mechanical invoiced at 222lbs. per bale. The variations were between 152 and 236lbs., not merely isolated bales, but batches. There would be a claim upon it. The analyst weighed the first bale, and got approximately the invoiced weight. The second bale he rejected as too light; the third bale he rejected as too light; and then he carried on for ten bales and decided to put them all in. It was ridiculous. What they wanted with regard to selection of bales was a representative sample. It did not matter what condition the pulp came in, so long as a representative sample of that pulp was taken. If they all happened to be torn they could not get a single "intact" bale, and must they lose because they could not make a sample that corresponded to the phrase: "Intact Bales"? Mr. Gemmell spoke of having to take bales from the top of a stack. Well, "news" mills had pretty big stacks as a rule. The stack could be cut by going straight down from top to bottom, so that they got a variation from top, centre, and bottom. The speaker went on to say that he happened to be at the docks at Grimsby on one occasion, and he noted the numbers of eight wagons, four of which were being filled and another four they were starting to fill. He took the numbers of these eight waggons. Their mill was not above a mile and a half railway journey from the docks, but these waggons came in on separate days, showing that the stuff as unloaded was not coming in any sequence. They got a good average over the delivery. If that happened on this side, what happened across the water when the bales came down from the mills to the port where they were loaded?

The Chairman said that a Committee appointed by the Papermakers' Association was endeavouring to agree to a revised form of Contract Note with the Brit-

ish and Scandinavian Wood Pulp Association. Wood pulp tests was one of the subjects under discussion.

He said that as pulp was coming in at the present time it varied much both in the weight of the bale and the moisture contents. He was sorry to say it, and perhaps it was a failing of human nature, but it appeared that as the price of pulp had soared upwards the moisture contents had shown a tendency to rise in sympathy. The figures submitted by Mr. Gemmell in the A.B.C. mills in regard to chemical pulp showed that if proper attention was given to the subject it might be reasonably dealt with. It would pay every mill in this country to employ a chemist, if only for the matter of pulp-testing; they would save his salary on that alone, and he would be useful in other directions. The big "news" mills must have claims amounting to thousands of pounds per annum. So far as the wedge system was concerned, it was an accurate, sound and scientific method, although, of course, where abnormal cargoes come along, common sense must be exercised. So far as his mill was concerned they always made a duplicate test with that of the analyst, and they never allowed the analyst to see their original test figures. When the analyst made his test they arranged to take a duplicate wedge, and were then able to check his results by their own re-test. As to the Contract Note, the question of what was an "intact" bale had been raised, and the view had been put forward that it might be desirable to alter the contract clause to read something in the sense: "That normal and intact bales should be taken." A normal bale would be one that was not wet by extraneous moisture. As to the question of specification, that would be possible in the case of chemical pulp, but in the case of mechanical pulp it was quite impossible. As to the period within which re-testing should be carried out it was not thought that the period of three days should not be exceeded for a re-test, because in the case of a "news" mill, where 1,000 tons of pulp per week might be used, there might under certain circumstances be an accumulation of several tons in the intervening period, and that would be a serious matter. The views of Mr. Gemmell would receive the attention of the committee, and it would be useful to get the advice of the official analysts before the matter was settled.

Mr. G. H. Gemmell, F.I.C. (Messrs. Gemmell & Thin), replying to the discussion, said he thought the debate showed equally as well as the paper did that there were a great many disputable points in regard to pulp-testing. In regard to the intact and undamaged bales that he referred to, it was very, very difficult to specify exactly what was meant by an undamaged bale; but, as he thought he remarked, if the analyst was in a position to select bales which showed no sign of damage in any way and he could get an ample proportion of these bales, he thought he was quite justified in rejecting the undamaged one. Mr. Gemmell thanked Mr. Bacon for his suggestion that the three days' allowance was three days from the time, he presumed, at which he certified his result. He had always taken it as three days from the time they originally took the sample. That was certainly too short a time. For instance is they drew a sample on Friday, they probably could not get it dried on Saturday, and it might be Tuesday before they got the result off. The effect was that the three days were exceeded. It was rather an awkward clause for the analyst, he must say. It was on very rare occasions that he exercised the option of returning to the mill and taking a further sample. If they did so, the papermaker wanted to know why they went back and asked what was wrong. The pulp maker also wanted to know why they did it, and all sorts of explanations had to be made. He agreed with Mr. Bacon with regard to the heartbreaking trouble of getting bales where there was a specification. There was no doubt that it was somewhat difficult. If they were to get representative bales according to the specification they had to turn over a great many bales. At the same time, the analyst's business was to go through and make as accurate a test as possible, and it did not matter whether he was taking two hours or two days, he had got to do it. He had made a suggestion, which he believed was being put forward in Scandinavia, and it had already been before the committee which was amending the Wood Pulp Contract Note. His suggestion, which had reference to the difficulty of getting bales from one part of the cargo only and not representative bales, was something on these lines. He did not put it forward as a perfect scheme, but simply with the idea that it might be discussed. At the port of delivery they knew that the bales came out of the ship in slings of four. If one sling out of every 25—that was four bales out of every 100—as it came out of the ship was laid aside (4 per cent. of the bales), and the stevedore was instructed to stamp these bales with some particular mark (a stencil supplied by the Association), these bales could be put in separate waggons and on arrival at the mill laid aside, and these would be the bales to be sampled. Of course, he saw there were objections to such a scheme, but he put it forward for discussion. They would at least get four bales out of every hundred, or they might take five out of every hundred, and that would be taken from all parts of the cargo, and there would be no difficulty about saying that they were not representative of the whole cargo. Mr. Gemmell added that he was glad to know his remarks had been received with such interest, and it just confirmed the view that he entertained that the whole subject bristled with difficulties, and that the analysts were between the devil and the deep sea. For instance, if they gave results, as in the larger proportion of cases they did, against the pulpmaker, they were in continual trouble with him. Only last week he had a letter from a papermaker who had to pay for two or three tons extra weight, and he assumed at once that they (the analysts) were wrong, and that they had made a mistake, but as he (Mr. Gemmell) maintained, and he stated it very definitely, they could not make mistakes because they took such precautions. They took precautions in checking and cross checking, and it was practically impossible for them to send in an incorrect result.

Mr. W. Leonard Tod (President of the Papermakers' Association), as an outcome of the discussion, which he thought had been very useful and interesting, moved the following resolution: "That this meeting of the Technical Section recommends that the committee now appointed to draw up a new Contract Note should consult the official analysts before the Contract Note is finally agreed upon, in order to get their views regarding the provisions for sampling and testing." He thought the views of the analysts, who had such an important part to play, should be before the committee, and they should know just what they felt in regard to the test before the new Contract Note was fixed.

The resolution was duly seconded, and carried unanimously.

Mr. Strachan moved that a number of mill chemists be included in the consultation, which was also carried.

FINLAND'S WOOD PULP AND PAPER INDUSTRY.

FINSK PAPPERS-OCH TRAVARUTIDSKRIFT, March 15, 1921.

The year 1920 began for our export industries under the most favorable conditions. Every sign seemed to indicate an active foreign market for the chief articles of export—wood and wood products. The rising tendency had been manifest since 1919. These influences were greatly intensified by the number of advertisements in the daily and periodical press, which consequently required additional quantities of paper and pulp. Producton exceeded the pre-war figures. All this indicated an active market, quite apart from the great rise in prices.

During the first part of the year the result was what might have been expected; sales were practically unlimited and prices rose steadily. But it was not long before a bearish movement was manifest. The beginning of this sentiment was at first missed by most market observers. A few, however, believed that the crest of the wave had passed, and during the latter part of the year a change for the worse was noted. Moreover, the influence of the war brought about a change in values which could not be foreseen. Political and economic causes, and mass psychology, exercised a potent effect, dislocating business and spreading an infection over industry like an epidemic.

Then it is to be recalled that the export duty on Finnish products had an evil influence. It imposed a burden on the wood pulp and paper industries, which placed them at a disadvantage in competition in the world's markets. However, 1920 has been marked by the fact that it is the first year in which business has been free from direct war influences. There are still restrictions upon trade, but on the whole it has pursued a normal course. Exceptions must be noted; for example, the eight hour day and the rate of exchange which has shown a downward movement from the beginning of the new year.

Timber Market.

During the first part of 1920 the timber market was active. By January 15 about 135,000 standards had already been sold, furnishing about 31 per cent. of the exports up to June. The tables of trade returns show that exports of the most saleable sizes went on favorably during the first months, declining towards the end, the total of standards exported in 1920 reaching 406,835. Exports of sawed wood amounted to 243,195 cubic meters; of battens to 1,273,852 cubic meters.

Wood Pulp Market.

At the beginning of 1920 there was a strong demand for wood pulp and boards. As prices had more than doubled in 1919 the belief prevailed that the high point had been reached. This was not the case. Prices rose rapidly during the first part of 1920. Then the decline began. In Europe the chief purchasers of Finnish pulp were France, England and Spain, and among transatlantic countries the United States and Argentina.

The paper mills of Finland took considerable quantities of pulp in 1920, about 13,000 tons of dry pulp, as compared with 3,000 tons in 1919. The Association of Finnish Ground Wood Mills reports the following sales during the past five years: 1916, 18,357 tons; 1917, 20,979 tons; 1918, 35,110 tons; 1919, 61,659 tons; 1920, 76,703 tons.

Of these sales in 1920 13,120 tons were for home consumption and 63,583 tons for export. Exports to America amounted to 11,792 tons, to England 9747 tons, to France 9468 tons, to Spain 4,043 tons, to Germany 5973 tons, and to Holland 1323 tons. The official trade returns give the total quantity of exports of wood pulp as follows: wet mechanical, 35,793,955 tons; dry mechanical, 64,096,551 tons.

Chemical Pulp Industries.

The cellulose market developed in 1920 practically on the same lines. During the whole of 1920 England was our chief customer, the United States coming next. It is worthy of note that our cellulose has gained a favorable position on the other side of the Atlantic, because great stress is laid upon quality in the United States, in order that the paper produced may meet the difficult requirements of the fast Fourdrinier machines. With regard to quality it may be said that it has been difficult to sell sulphate cellulose in 1920. Yet technical and chemical improvements have been made. Total production of cellulose can now be estimated at 300,000 tons a year. The new Aug. Eklof mill is in operation with an output of 15,000 tons of sulphite. The Cellulose Association's figures of 1920 sales are as follows:

Sulphite.—Finland, 16,538 tons; Foreign, 45,570 tons.
Sulphate.—Finland, 550 tons; Foreign, 19,036 tons.

The United States purchased 11,859 tons of sulphite, and 7,543 tons of sulphite. Exports to England were; 16,261 tons of sulphite, and of sulphate 6,303 tons.

Boards.

The demand for boards was also very active during the first part of 1920. Quotations on the English market were from £25 to £27. At various times these quotations rose 30 per cent. Prices were maintained until the end of the year when a decided fall occurred. Total sales of boards from 1916 to 1920 have been; 1916, 48,623 tons; 1917, 19,735 tons; 1918, 9,194 tons; 1919, 18,528 tons; 1920, 38,413 tons.

Of the 1920 sales 4,228 tons were to home consumers, and 34,185 tons for export. Most of these exports, or 23,149 tons, went to England, while America took 3,783 tons and France only 99 tons.

Paper Industry.

The outlook for our paper industries is also very satisfactory, demand being active in all departments. News print occupies the first position. In connection with this subject the course of prices has been peculiar. In the early part of the year quotations rose, but during the summer months the market manifested a bearish tendency. If we inquire into the causes of this depression, we find—apart from the universal economic disturbance—that buyers of paper were caught with unusually large stocks. The most potent influence was the liquidation of the speculative position, and this combined with a scarcity of money, and the dominating factor of all—Canadian production—induced a severe slump. Besides these things must be mentioned the interference of the Diet in the price of news print paper. Net production of the paper mills in 1920 amounted to 157,588 tons, compared with 95,104 tons in 1919. Of the 73 paper machines there have been from 53 to 58 in operation. According to official statistics exports of paper may be grouped together thus:

Wrappings, brown	19,620,718	kilos*
Wrappings, other grades	7,521,465	"
News print	90,072,026	"
Wall papers	2,689,803	"
Writing papers	8,652,534	"
Tissue paper	1,620,811	"

* 1000 kilos=2204 lbs., practically 1 long ton.

British Trade News

(FROM OUR LONDON CORRESPONDENT.)

London, 10th May, 1921.

The British paper industry still remains in a very unhealthy condition. On the one side, the coal miners, who are still on strike, are gradualy causing mills to close down, and on the other side, there is a keen fight against foreign imports coming into the market. As a result of these two elements, unemployment in the British paper industry is alarming, and merchants report little or no business being done. The "war" in the newsprint world still wages between the manufacturers and the consumers, and the latter gentlemen do not care one iota, according to their arguments, where the paper comes from so long as they can buy it at their own price. But the British manufacturer does care, because he must find an outlet and sell at a reasonable price to keep his mill going. The consumer says British newsprint has gone up since 1914 to the extent of 300 per cent, whereas the world price is below it. The manufacturer's case is answered by a newspaper proprietor, strange to say, who says: "The paper makers bought certain supplies of pulp in order to meet the needs of the newsprint users. Can they now justly be asked to make ruinous sacrifices by cutting their losses and bring down the paper to 2⅞ d.? But why 2⅞ d.? Why not make it 1¼ d. (equal to 2½ cents), less 17½ per cent as obtained once upon a time? The total yearly consumption of paper at present in this country is round about 1,200,000 tons. Thirty per cent of it is newsprint, 30 per cent writings and printings, and 40 per cent wrappings, etc. So that there is plenty of room for increased consumption before newsprint occupies the premier place. Yet the mills give to newsprint more consideration than to all the rest. At 4 d. (8 cents) there is a heavy loss to the maker, a state of affairs that cannot go indefinitely without ruining the industry. We have lately heard a good deal about the price of newsprint in America. The International Paper Co.'s price is 5½ cents, U. S. currency. Except in one case, the Canadian figure is also 5½ cents. But this paper, delivered in London, would cost £48 18 s. per ton. Forwarded to the provinces it would cost more. And what about the British papermaker? Well, his price is £37 6 s. 8 d. delivered anywhere in the United Kingdom. The only way to cheapen home-made paper is to find British support for it, so as to enable the mills to run at full capacity. Then the price will rapidly come down well below 4 d. (8 cents)." This is a newspaper owner's case for the papermaker and it is a reasonable one, and, also, of great interest to Canadians. But this only applies to the home market. In their connection with Australia and South Africa, the British papermakers have had more cancellations recently than they have had orders, and large orders of paper made up for the Colonial markets are being held in England awaiting some adjustment of the present financial stringency in these parts. There is a considerable falling off in trade in the Dominions and Colonies, and official as well as papermakers' figures bear out this fact.

Pulp Prices and Exchanges.

Before quoting the prices of pulps in England today I would first like to refer to the rate of Exchange in some countries with which the British papermaker has to compete. I mentioned some time ago that the Germans could buy their pulp cheaper than any country could produce it in Finland and this was one of the elements that enabled them (combined with low wages) to sell cheap paper in the British market. Well a comparison of some of the Exchanges will give an idea how the foreign papermaker will do business. In 1914 the German mark (equal to 24 cents) was worth 24 cents (1 s. in England); in 1920 (today) it is worth 1.8 cents (1 d. in England). Then we turn to Finland where in 1914 the mark was worth 19 cents; today it is worth 2¼ cents in England. In 1914 the Austrian kroner was worth 20 cents; today in England it is practically valueless. The Belgian franc worth 19 cents in 1914 is today worth 9 cents (or 4½ d.) in England. Now with these countries it is impossible to compete with such exchanges, particularly when one considers that the British sovereign (£1) is worth 246.94 marks in Germany and 53.95 francs in Belgium. It was on the strength of these exchanges that Mr. Stanley Cousins, on behalf of some of the British papermakers no doubt, wrote his famous letter to the "Times" in London — and which dropped like a bomb in a ton of cordite in some of the newspaper offices — asking the Government to put a protective clause in the Anti-Dumping Bill to save the paper manufacturing interests from unfair competition. The whole policy of the consumers is unfair and a poor return for services rendered during the critical times in war days.

While on the subject of paper prices one may naturally ask what are the prices of pulp in London today. Well bleached sulphite can be bought at £39 10s. a ton; easy bleaching at £30 and sulphite newsprint quality at £25. Unbleached soda (No. 1) is down to £29 10s. and kraft quality to £29 10s. to £30. Groundwood is £8 10s. (wet) and dry £17. The markets are idle at these quotations.

Printers' Exhibition.

On the invitation of Mr. F. W. Bridges, the organizer, I paid a visit to the Printers' Exhibition on the opening day. It is being held in the Agricultural Hall, London, and from a printer's point of view was excellent, but from a papermaker's point disappointing. One would imagine that British papermakers would be quick at jumping at the opportunity to display their mill's work before the printer. However, the show made by the agents, merchants, and manufacturers, that did take the advantage of the exhibition was such that one could not help but admire. Lindermeyer and Johnson Paper Co., Ltd., amongst other things made a nice display of the American Writing Paper Company's brands of paper and boards.

THE SITUATION IN BRITISH COLUMBIA.

With many contracts that extend far into the future, the Pulp and Paper industry in British Columbia may not be as hard hit as in Eastern Canada. On the other hand it is certain that there will be no new developments in the industry for some time to come.

By keeping the wheels turning the companies in this province have helped the unemployment situation very materially and in one or two instances it has meant some pretty close figuring by those at the head of the organizations to accomplish this.

Had there been large reductions of the working forces or shut-downs it would have meant the addition of upwards of 2,000 men to the unemployed ranks.

New business is uncertain although a hard drive is being made to secure orders on a profitable basis.

WHERE SOME OF THE RIORDON MONEY WENT.

The Pulp and Paper Magazine is no more interested in the Riordon Company than in any and every other mill in Canada. This little story is told simply because it seems that a good many people have overlooked certain features of the situation which it seemed to us only fair to make known.

In the letter which was issued by the special Committee of Directors of the Riordon Company, intimation was made that estimates of the cost of the new Kipawa mill were greatly exceeded by actual construction costs and that this may have been an important factor in precipitating the need for emergency financing. The Pulp and Paper Magazine thought that the industry might be interested in knowing something more of this subject and after further investigating the situation, the following information was gathered. It may be mentioned incidentally, that the editor has personally seen the plans and the plant at Temiskaming and thinks that there are possibly some people connected with the industry who do not fully appreciate the objects and ideals which were in view when the Kipawa mill was projected. There is scarcely any question that a mill which would produce at lowest cost, as this mill is designed to do, must necessarily be the last word in mechanical efficiency, protection from contaminating dirt and effective for maintaining the acme of strength and cleanliness. Where a European mill can afford to pick out dirt and shives by hand, a Canadian mill to produce the same quality must eliminate or prevent the entrance of such materials by mechanical means and this requires higher initial expense for such perfection of construction and equipment. It is only by such measures that a Canadian mill can produce the highest grade of chemical pulp. As pointed out in the description of the mill published Sept. 16, 1920, nature does a lot of work free, because of the design and construction, where other mills will pay expensive labor. Money has been well spent to save operating cost. Records of results already show that unusually low labor charges are an accomplished fact.

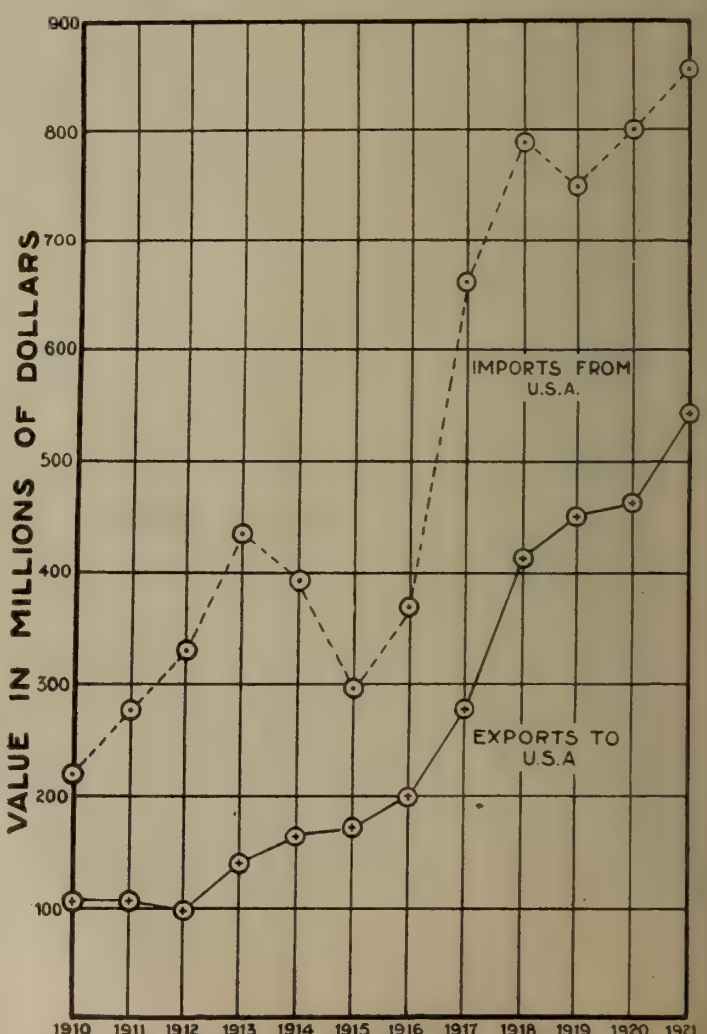
To return however, to our subject. The public probably does not realize that the Kipawa plant was designed for a capacity of 500 tons a day and that a large amount of construction work has been done once and for all to provide for certain factors necessary to the carrying on of the plant at full capacity. Among these items a few will be mentioned. Beginning at Kipawa Lake we find a storage reservoir of ample capacity and a pipe line 2¼ miles long to a forebay just above the power house which is of ample capacity and equipped with the necessary gates and flume outlets to provide all the power that will ever be needed by the mill. As mill construction progresses it is not only necessary to carry a short flume from the forebay to the lake shore as additional generator units are installed. In this connection all of the subaqueous work at the power house is complete so that 4 power units can be installed and housed as mill capacity is increased. Considerable other work on Lake Temiskaming has also been completed. This includes the booms and provision for water transport of logs together with the log haul and practically all of the barker equipment.

Proceeding to the mill we find that the wood storage ground has been entirely levelled, tracks laid, and fire protection lines installed for full mill capacity. This is without doubt the finest wood storage layout in Canada and should prove exceptionally economical. Provision has also been made for the unloading and handling of wood brought in by rail from settlers and jobbers. At the mill we find that excavations have been made and foundations laid considerably in advance of the presently erected digesters, blow pits, and steam plant.

It might be worth while to recite also, a few points with regard to the work of the contractors. This takes us back to the winter of 1917 and 1918 when the plans and estimates were completed. Since that time everybody knows what happened to labor and other construction costs. The workman in many instances did about half a day's work for previously undreamed of wages. It was necessary also to provide complete housing advantages and some social attractions for a new town in the wilds and better meals were served than most of the workmen had been previously accustomed to. In addition to this, freight rates and cost of materials continued to increase and Government taxes were also unexpectedly levied. It is true that on certain portions of the work the original estimates were considerably overrun, partly due to the urgent demand about a year ago for pulp and the necessity of rushing construction to meet it, but it is only fair to mention that on several other portions the construction cost was less than the estimated expenditure.

CANADA'S TRADE WITH THE UNITED STATES, 1910-1921

(Fiscal Years ending March 31 of Each Year)



Exports are climbing a little faster than imports.

News From Europe

The Effect of Shorter Hours in the Mills.

Reports from Holland to the Industrie und Handelszeitung show that the reduction of the working week from 50 to 45 hours has caused a rise of 10 per cent. in the cost of commodities. To obtain the previous output new shifts must be hired which have a bad effect on the other men, who naturally make less effort and work more slowly. The belief that shorter hours would refresh and brace the energies has been illusory. As a matter of fact, three instead of two shifts have been necessary, with great loss of time, efficiency, and precision. Yet wages have been kept at the high level. —PAPPEN-und HOLZSTOFF-ZEITUNG, April, 15, 1921.

Canada's Paper Industry in Foreign Eyes.

The German and Scandinavian journals are devoting much space to descriptions of Canadian mills and processes of pulp and paper making. In a review of the causes of the development of paper making in Canada, the Industrie and Handels-Zeitung observes that it is due in a large measure to technical skill and new inventions. The "new invention" in particular, of making a useful pulp out of certain resinous varieties of fir assures a long period of success.—Industrie und Handels-Zeitung, April 7, 1921.

The Study of Wood Cellulose Chemistry at Abo, Finland.

The Association of Wood Working Industries of Finland have appointed a faculty of chemical and technical members, including a professor of the chemistry and technology of wood. A committee composed of Professors Ossian Aschan, Peter Klason and Svante Arrhenius, laid out the plans—an indication, if one were needed, of the excellence of the work. Professor Erik is the present holder of the chair.—Papir-Journalen, March 12, 1921.

The German Paper Industry and the "Sanctions" or Penalties.

(It might be well to read a little between these lines, but not too much.—Ed.)

The paper industry, like every other undertaking, in Germany, is suffering from the effects of the "sanctions" imposed by the Entente. In March, for instance, the manufacture of paper goods declined 50 per cent. The duties have laid a vast number of the population under direct contribution. Yet the total income of the nation is considerably less than in the year preceding the Rhine customs.

For this draft on their earnings the Germans complain that they are not even guaranteed the assurance or security that they will be allowed to work. When the establishment of customs on the Rhine was mooted, it was generally condemned by its critics on the ground of the enormous cost involved in collecting duties regularly. The authors of the plan did not take into account the fact that the cancellation of orders both from the interior and from abroad, would steadily subtract from the customs a considerable part of the estimated receipts. After a few weeks of trial the separation of Germany into two parts has become an unprofitable scheme and placed the Entente in a difficult situation.

But politicians at Paris have allowed their seeming success to obscure the fact that industrial taxation, as planned and carried on, could not survive undisturbed. Their policy of destroying credit and industry is rapidly transforming the nature of the operations in business, and already capital is seeking new markets in Russia. In spite of urgent appeals to "support the occupied territory," new contracts are being held up, orders are being cancelled, and capital is fighting shy of investments in these places, for customs are not among those things that can be passed on to the consumer beyond their reach.

Tendencies are moving in the direction of the cessation of business with the regions included in these customs, with the result that the effects of the duties have nullified to a considerable extent the advantages anticipated on their introduction. Meanwhile as the industrial classes are working, and working hard, the products of their labor are being devoted to trade with the interior of Germany. It is stated, for example, that the Frankfurt Fair was remarkable for the extent and quality of the paper, books and machinery in the paper branch. Having educated the working classes to the point of laboring systematically for the future, it should not be difficult to carry the process a stage further to industrial union with the States of Eastern and Southern Europe.

It is most remarkable that the French occupation of German cities has been received with extraordinary composure. The folly of the attempt, which costs France far more than she can recover, is patent. The supreme achievement of the French in this business is that it has inculcated habits of thrift and work in that section of the community generally inclined to improvidence. It would in fact appear that the present system of industrial subjection imposed by the French would produce considerable losses to them, and considerable benefits to the toilers.—PAPIER-MARKT, April 20, 1921; Wochenblatt fur Papierfabrikation, April 23, 1921; Papier-Zeitung, April 28, 1921.

The Paper Mill at Prague.

In the report of the Prague Company it is said: "The two years of peace have shown unfortunately that we are far from normal operation and orderly economic or industrial conditions. The increasing rise in the cost of materials and in wages are evidences. As an example the following figures will serve:

	1919	1920
Wages	2,321,230.04 kr.	4,981,133.23 kr.
Maintenance	576,062.12 kr.	1,366,250.35 kr.
Fuel	930,433.09 kr.	3,248,769.97 kr.

The cost of 100 kilograms of paper has increased 275 per cent. over 1919. However the balance sheet shows that the mill has been able to pay a 5 per cent. dividend.—ZENTRALBLATT fur die PAPIERINDUSTRIE, April 15, 1921

Better Prospects in Sweden.

According to the Svensk-Pappers-Tidning, there are signs of a renewed demand for Swedish paper and pulp. While there is no actual business at present, the market will probably become active toward the end of Summer. A favorable factor is the falling off in German competition, owing to the 50 per cent. levy on German exports.—Svensk Pappers-Tidning, March 1921.

The Ruin of Europe.

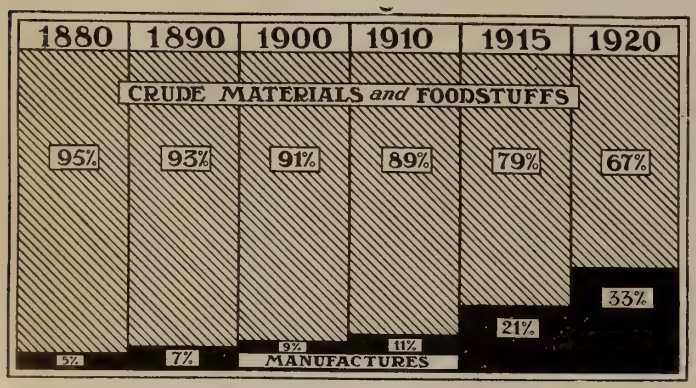
The prediction of a Spanish writer that the interference of the United States in European affairs, though

it may please some, has increased the discontent of the workers, is certainly a new line of thought. "Europe," he says, "is dethroned politically and commercially, and whether we like it or not, America is today the strongest and richest power in the world, and her money and resources are illimitable. This is profoundly true, but unfortunately it is also true that the United States is no longer democratic, but an imperialistic power. This power," continues the Spanish writer, "is formidable; the evolution of its economic and social life has followed the same course as the European. During its best phase America was concentrated on itself; its spirit was democratic. But the development of capitalism has since evoked the tendency to imperialism, and inspires it to intervene in international questions. The war has reduced France and England from the postion of creditor to that of debtor nations, owing financial allegiance to America. The weakness of Europe is the strength of the United States, and also Japan."—ERGOS, April 1921.

(The Spanish writer's argument is worth noting. Owing to the world upheaval caused by the war, which has greatly lengthened the shadow of the United States, industry in Europe is in a great measure paralyzed.—P. B.)

GROWTH IN CANADA'S EXPORTS OF MANUFACTURED GOODS, 1880-1920.

The graph shown below records the increase in the percentages of our exports of manufactured products in periods from 1880 to 1920. Exports of crude materials and foodstuffs are represented by the shaded



lines; manufactured products by the heavy black. The significance of the percentages shown is that they indicate a steady and rapid increase in the growth of the exports of Canadian manufacturing industries. In 1880, 95 per cent of our exports consisted of raw materials and foodstuffs, and 5 per cent of manufactured goods. This proportion has steadily decreased, until in 1920 raw products were represented by 67 per cent of the exports, while exports of manufactured products had risen to 33 per cent.

MATTAGAMI PULP TO REOPEN MILL.

Owing to a slight improvement in the market for unbleached sulphite pulp, it is proposed to reopen the mills of the Mattagami Pulp & Paper Co. at Smooth Rock Falls, Ont., next week. The plant has been closed for about a month, owing to dullness in the sulphite market, but some demand has been received, resulting in the decision to recommence operations. The plant is located on the Mattagami River west of Cochrane. The sulphite mill has a designed capacity of 45,000 tons per annum.

CONNECTICUT VALLEY BRANCH OF THE COST ASSOCIATION BUSY.

The eighth regular meeting of the 1920-1921 season was held on Monday evening, April 18, 1921, at the Hotel Nonotuck, Holyoke, Mass, with an attendance of forty.

The meeting was a most lively one, and filled right up with the most interesting problems. Mr. J. A. Reilly, President of the Local Association, opened the meeting with a brief talk on "The Tying in with the General Books." He illustrated his talk with various forms which are used at the American Writing Paper Company. During this period, the attendants took a most active part in the meeting by asking many questions in connection with Mr. Reilly's explanation of this problem.

The next problem which was presented was "The Correct Method of Retiring Un-Or-Overearned Burden and Burden Variances from the Cost Ledger to the General Ledger," This subject aroused a real spirit of interest, and a good number of attendants took part in the discussion. The problem as presented, was as follows:

At the closing of the Cost or Mill Ledger, an Unearned Burden was arrived at amounting to $7,000 approximately. The reason for a part of this Uuearned Burden was found to be the arriving at too low a departmental rate. After determining a more correct rate and applying same to hours of operation, the difference arrived at, according to general sentiment, was a legitimate additional charge to Cost of Goods Sold or Finished Stock Inventory. This difference reduced the original Unearned Burden of $7,000 to $3,000 approximately. The question was then brought up as to the disposition of this $3,000 and it was answered as follows:

If the account in question, through lack of operation, failed to earn its Burden, it must have reflected saving in the various elements that make up Burden. This being true, it would resolve itself into a credit variance, and should offset the loss through lack of operation (with the exception of the fixed charges in this account). And they, being standard, would accumulate regularly as an expense, whether they were incorporated in the Burden or written off as an expense. Consequently, this would mean that there has been arrived at both a loss and gain item in this account, which should be retired to the General Ledger under the same account—namely, Un-or-Overearned Burden and Burden Variances. These accounts would be closed periodically and drawn off on the Loss and Gain Statement.

LABOR TROUBLES RELATIVELY FEW.

"Based on a general survey, it is found that not far from one half of the manufacturing plants in the paper industry do not have and never have had any disturbances in their internal industrial relations," declared L. M. Alexander of Port Edwards, Wis., chairman of the industrial relations committee in making his annual report to the convention of the American Paper and Pulp Association. "The other part have had from minor to excessive difficulties, no matter whether the labor is organized or unorganized, whether the industry is operated upon closed or open shop principles. We think with proper consideration of this subject we may be able to develop for the benefit of all, methods that could help work for peace and harmony in this industry."

EMBARGO OR EXPORT TAX ON CANADIAN PULPWOOD.

Anyone who can travel on our railroads and see the immense amount of pulpwood piled alongside the tracks all through Quebec, Ontario, and New Brunswick for shipment out of the country, or who will visit Sherbrooke, Campbellton, or McAdam in the busy seasons and see trainload after trainload of pulpwood being shipped away from our Canadian mills, or will visit our seaports and see steamerload after steamerload shipped to Portland, Maine, knowing that every trainload and every steamerload is shortening the life of our pulp and paper and lumber industries, and can see this all going on and not lift a hand to help stay the same, is to say the least, not a good Canadian.

The American mills in their activity for the removal of the embargo on the shipment of Crown land wood do not expect to succeed in having any restrictions removed, but are simply agitating this question with the hope that it may prevent the placing of a further embargo or export tax on the shipment of fee land wood, which is now furnishing them with a million and a quarter cords of pulpwood annually and shortening the life of our mills to this same extent.

This agitation is instigated principally by one of the larger American paper companies, that has a small supply on its own lands in the United States, and is there fore, selfishly interested. Many American manufacturers freely admit that they are surprised that Canada has not taken steps to prevent the export of pulp wood long before this.

Our first duty should be to stop the shipment of raw wood out of the country; our second, renewed and increased fire protection for our forests; our third reforestation.

I say first stop the shipment of wood. Why should we protect our forest from fire and plant seedlings while we are continually shipping mature trees out of the country faster than we are planting them?

The next matter of importance, is the retention for our own manufacturers of our other raw materials, and the further development of our coal mines and water powers.

Furthermore, as far as possible, our railroads should be run by electricity rather than by coal. The saving that we should make by the prevention of the loss of the timber alone, which is burned up annually by our railroads, would more than pay the interest on the entire cost of their electrification.

An actual embargo is the only measure that will prevent the shipment of raw pulpwood to the United States. However, an export tax of $10.00 per cord is the next best measure. This would not check shipments in any way, but would at least give Canada an additional revenue of $12,000,000.00 per year on the million and a quarter cords now being shipped annually to the United States. This $10.00 per cord would simply be paid by the American consumer, so that, by the imposition of this tax, no Canadian interest would be affected or injured in the slightest degree, and the country would be receiving some slight compensation for the loss of one of its most valuable assets.

Surely a measure that will increase Canada's revenue to the amount of $12,000,000.00 without detriment to any one in the Dominion calls for immediate enactment.

FRANK J. D. BARNUM.

PRESIDENT W. J. RAYBOLD ON TRADE ORGANIZATIONS.

The following is an extract from a letter of the new president of the American Paper & Pulp Association.

The last few years have demonstrated the great value to industry of trade organizations. The accurate information in regard to market conditions placed before the business man by modern trade associations makes competition healthy and constructive instead of unhealthy and destructive. It increases the chances for success and decreases the number of failures. Better and more uniform methods of cost accounting made possible through these organizations have been of great value to the public and the worker as well as to the manufacturer.

I believe there is a new era opening for trade organizations. Experience during the war period con-



WALTER J. RAYBOLD.

vinced business men generally that they are not only helpful but necessary to business success.

Under its new Articles of Association there has been been opened up a large field of activity for the American Paper and Pulp Association that need not encroach in any way on the work of the divisional associations.

Of course the success of an organization of this kind depends almost entirely upon the hearty co-operation of its membership. Your present officers feel that they will have this kind of cooperation from every member, as only through effective cooperation can the association be made of the greatest service to our industry.

We are passing through a period of depression, but in the opinion of many prominent men in the industry we have passed the worst and can look forward with hope to the future.

FRENCH JOURNALS ON PAPER MAKING.

The following list of French paper trade journals has been very kindly furnished by Mr. Héry, of "Le Papier":

"La Papeterie", 9 Rue Lagrange, Paris V°.

"Le Moniteur de la Papeterie Française", 154 Boul. Haussmann, Paris VIII°.

"Papyrus", 30 Rue Jacob, Paris VI°.

"Revue Universelle de la Papeterie et de l'Imprimerie", 79 Rue du Cherche-Midi, Paris VI°.

"Le Papier", 16 Rue du Rocher, Paris VIII°.

The Rollands are Specialists in High Grade Papers

By A. R. R. JONES.

The first mill in Canada to make finished high-grade bond and writing papers was built in the year 1882 at St. Jerome, in the Province of Quebec, by the Rolland Paper Comuany, Ltd. Of this Company, the late Senator J. B. Rolland was the founder, and the mill erected at St. Jerome, which is a thriving town in Terrebonne Co., on Rivière du Nord, 33 miles from Montreal, with a present population of some 5,300 people, was an exceptionally fine one for those early days in the history of the paper industry in Canada. After the late Senator Rolland's death, his work was carried on by his two sons, the late Hon. J. D. Rolland and Mr. S. J. B. Rolland, the present president of the Company.

The Company has always, from its earliest days, specialized in high-grade products, and the site at St. Jerome, by reason of the excellent water-power which has been developed and of the abundant supply of clear, fine water enjoyed there, has been found ideal for its purposes. The mill was equipped to produce a loft-dried and tub sized paper of the highest grade, and, from the very first, specialized in an all rag paper, which was watermarked Superfine Linen Record. In 1885 — three years after the foundation of the Company, — this paper obtained the Gold Medal at Antwerp. In 1893, it received the Highest Award at Chicago, and, in 1900, it was awarded the Grand Prix at Paris.

Since its erection, forty years ago, the mill at St. Jerome, has been repeatedly enlarged and improved to keep abreast of the most modern methods of paper-making. In 1912, the Northern Mills Company at Mont Rolland was taken over by the Rolland Paper Company, Ltd. This acquisition has enabled the Company to increase its production and make a complete line of bond, writing and ledger papers. Mont Rolland is beautifully situated about 40 miles from Montreal, among the Laurentian hills. Its population is composed almost entirely of the employees of the Company and their families, and the mill itself is generally regarded as one of the model mills of North America. The location of its various manufacturing units is exceptionally well planned, and the plant is well organized and kept in splendid condition in every way.

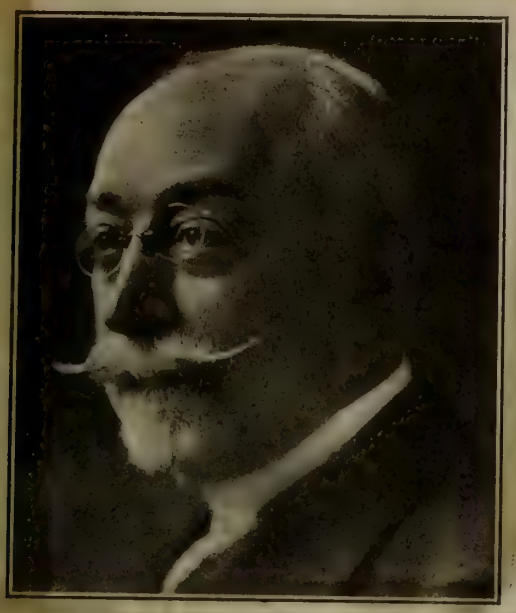
Indeed, it may be said of both mills that they are in first-rate order with every machine in shape to produce the utmost in both quality and quantity. Considerable improvements to both of them have been made recently and the equipment and buildings of both have been renderd as efficient as it is possible to make them. At Mont Rolland, a wing has been added, in which an increase has been made in the number of beaters, and additions to the machinery, including tub-sizing equipment, have also been installed.

In addition to the Superfine Linen Record—to the manufacture of which and like qualities of the highest grade the St. Jerome mill is exclusively devoted — other well-known watermarks of the Company are the Earnscliffe Linen Bond (in which quality the Mont Rolland mill specializes) the Empire Linen Bond, the Colonial Bond and the Mount Royal Bond. The special insignia of the Company, is the shield bearing the letter "R". This is its trade-mark and is also largely used as a watermark. And it is safe to assert that it is a guarantee of the superior quality of the product that bears it.

The Rolland Paper Company is a family concern. As has been stated Mr. S. J. B. Rolland, who is at present visiting Europe, is the president of the Company. His nephew, Mr. J. P. Rolland, son of the late Hon. J. D. Rolland, is vice-president. Mr. Jean Rolland, a son of the president, is general manager of the Company. Mr. Olivier Rolland, another son, is manager of the Mont Rolland mill, while a third son, Mr. Henri Rolland, is at the St. Jerome mills. Thus, starting with the late Senator J. B. Rolland, three generations of the family have had the active direction of the Company's operations and policy. This is in full accordance with the traditions of long established mills in old France, where mills were operated by the same family for several generations, apart from the record of Price Brothers and Company, Ltd., there can be few families in Canada



THE ROLLAND PAPER CO., LIMITED
ST. JEROME MILLS.



MR. S. J. B. ROLLAND, President.
Rolland Paper Co., Ltd.

whose record, in this respect, equals that of the Rolland family.

As is, perhaps, natural with a family concern, such as the Rolland Paper Company, Ltd., the relations between the Company and its employees are particularly happy and cordial. Over thirty-three per cent. of its male employees have been with the Company more than twenty years, and seventy per cent. have been with it over ten years. These facts constitute a striking tribute to the contentment and satisfaction that the employees, as a body, experience in their employment. Further than that, service of such considerable length in the one establishment has resulted in giving an exceptionally fine experience to the great majority of the employees and in making of them real experts in their various branches of work. It is, no doubt, largely due to this length and loyalty of service, and to the harmonious relations that subsist between employers and employed, that the Company has been able for so long, and is able today, to maintain undiminished and unimpaired, the remarkably high standard of quality of the products for which it is noted.



MR. J. P. ROLLAND, Vice-President, Rolland Paper Co.

A word should here be said as to the great and genuine interest that the Rolland family has consistently displayed in the communities in which its mills are situated, and the majority of the members of which are connected with those mills. Mr. S. J. B. Rolland, was for fifteen years Mayor of St. Jerome, and established a Chamber of Commerce there. Mr. Jean Rolland, the general manager of the Company, was the first resident manager of the Mont Rolland mill when it was established. He evinced keen interest in the living conditions of the workers there — an interest which is continued by Mr. Olivier Rolland, the present manager at the Mont Rolland mill — and was instrumental in the establishment of schools and the advancement of education generally. He has been Mayor of the town of Mont Rolland. Mr. J. P. Rolland, vice-president of the Company, is manager of the head office in Montreal.



MR. OLIVIER ROLLAND, Manager, Mont Rolland Division.

The Company, it should be mentioned, has branch offices in Toronto and Quebec city. Its product is distributed all over Canada through the jobbers.

Mention should not be omitted of the really superb book, "From Rags to Writing Paper", which the Rolland Paper Company, Ltd., has just produced and copies of which it is presenting to its friends. The contents of the book in question consist of reproductions of twelve sketches by Mr. C. W. Simpson, R.G.A., with descriptive notes on the process of transforming rags into writing paper. The sketches are a complete success in visualizing this highly-complicated process. The text explains the meaning of the sketches in the clearest and most intelligible terms. And the whole presented in chaste, yet sumptuous, form, constitutes a veritable work of art such as is eminently worthy of the reputation of the Company from which it emanates.

P. Heenan, Ex M.P.P. addressed a meeting at Dryden, Ont., of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, a few days ago.

The Nipigon Fibre and Paper Co., Limited, commenced the manufacture of pulp at Nipigon last week. About forty men are employed in the plant at the present time.

The Coal Situation; Spring 1921

The following special letter has been sent to members of the American Paper and Pulp Association:

Last year, where there was a promise of an acute situation in the coal industry, the American Paper and Pulp Association sent to its members a printed letter attempting to analyze the situation as it then existed, and later in the year another such summary of conditions was distributed.

The strike in England and the under-production as well as under-consumption in this country, seems to warrant another investigation this spring, and the result is given below.

Production.

It has been estimated that 550,000,000 tons of soft coal constituted a normal yearly production sufficient for the United States and its export demand. The "line of safety" in soft coal production has been drawn roughly at 10,000,000 tons weekly. Production below this figure, if continued for any material length of time, invariably results in a subsequent shortage. Present production has fallen to about one half the normal average capacity production of the mines. There is no demand; consequently both price and output have declined.

Average Weekly Output.

During	Tons
November	11,685,000
December	11,429,000
January	9,613,000
February	7,728,000
March	6,592,000
April, estimated	6,300,000

"Black Diamond," a trade journal of the coal trade says that production for the last week of April reached new low levels.

One prediction as to production for 1921, on the basis of the first three months of the year, is that the total for the year will be from 100,000,000 to 125,000,000 under that of last year, but part of the drop is due to heavy production the latter part of 1920, when industries accumulated large stocks, before curtailing operations. Foreign demand which took 21,000,000 tons last year, will probably be quite light this year, compensating in part for the prospective underproduction.

Transportation.

Although it is generally known that there are thousands of idle cars today it must be recognized that transportation is the most serious problem confronting the coal industry. Unfortunately, there is a seasonal demand for coal, which complicates the transportation situation especially during the fall and winter months. If it were possible to spread the demand, and consequently the haulage, over the entire year, the difficulties of coal transportation would be materially reduced.

At present there is no shortage as far as transportation facilities are concerned, owing, largely, to decreased production. It is estimated by Mr. Daniel Willard, Chairman of the American Railway Executives, however, that the railroads of this country are 40,000 cars short of a normal carrying capacity, as far as coal is concerned. This is equivalent to transportation facilities sufficient to handle approximately one-fifth of the entire coal supply of the nation.

From the above it would appear that as soon as a normal demand revives and production, consequently, increases, consumers may have difficulty in getting prompt shipments of coal. This difficulty, as well as the price of coal would probably be increased by any general business revival.

Rail Rates.

The present rail rate agreements extend until July 1, 1921. A reduction in rail rates, before or after July 1, probably would not have marked effect on the price of coal. It therefore would seem inexpedient for buyers to hold off in contemplation of cheaper coal from reduced freight rates.

Commercial Stocks on Hand.

The United States Geological survey has published the results of a questionaire on the commercial stocks of coal, on April 1, summarizing replies received up to April 27. This survey shows that production declined steadily from December, 1920 to March 31, the end of the coal year. In March and early April the soft coal mines were working on an average only two or three days a week.

"Before," says this survey, "it is assumed that the slump in the output foretells a shortage of coal, two other facts must be taken into account: First, that the slump was preceded by several months of heavy production; second, that the slump in output was accompanied by a great cut in consumption."

A total of 3,779 plants reporting, shows stocks of soft coal on hand as follows: January 1, 1919, 18,004,000 tons; April 1, 1919, 12,464,000 tons; March 1, 1920, 7,097,000 tons; January 1, 1921, 13,770,000 tons; April 1, 1921, 11,159,000 tons. The plants on which computations are made are identical for the various dates given.

View of Senator Elkins.

A significant letter has been written to the association by Senator Elkins in which he urges the ending now of the buyers strike against the coal industry. Failure to follow this course he says will mean a repetition of last year's "famine" conditions. He says prices are as low as they can go and that the present wage scale stands until April 1922 and that no cut in rail rates can come in time to correct the present situation. He suggests seasonal freight rates to expedite moving of coal in years to come but this cannot be done in time to meet this year's situation.

Conclusions.

Not since pre-war days has the volume of coal production fallen so low. As a result, coal is cheap, the mine price of good coal ranging between $2.50 and $4.00 per ton, depending on grade. Unless production costs fall materially, which is unlikely, it is probable that coal prices will not go appreciably lower. In the past it has been customary to advance the mine price of anthracite coal 10 cents per ton each month through the summer.

For the time being, there is sufficient rolling stock to transport the mine production. There is not enough to handle a normal demand however. The increased demand of fall and winter will stimulate production, which will increase the difficulties of transportation. There is little or no opportunity to store coal at the mines. This must be done in the retail yards and the consumers' bins.

Owing to the conditions discussed above, it is recommended that consumers place their orders now for their regular needs, as well as for a small surplus, contracting of course to the best advantage possible, and taking delivery through the spring and summer.

PULP AND PAPER NEWS

The Association of Canadian Advertisers will hold a three-day Convention at Montreal commencing on the 3rd June. The Convention will be held at the Windsor Hotel. There will be several booths, and the Canadian Pulp and Paper Association has made arrangements for having a booth of its own, at which samples of various papers will be displayed for the benefit of visitors.

There has been no development of any importance during the past week, relative to the unfortunate strike involving a number of mills in this country as well as in the United States. But the opinion is being freely expressed in many quarters that J. T. Carey, as a strike leader, is not showing himself much of a strategist. If he had wanted a regular stand-up fight to a finish, over the question of the proposed wage reduction and alteration of working hours, he should, it is being said, have called a strike in every mill, with the object of paralyzing the industry. Instead of taking that bold course, however, he has gone to certain centres, where possibly, he had reason to think that his power was not so great as in others, and he has settled, at those particular points, on an agreement which is not an agreement. That is to say, he has allowed some mills to keep running at the old rates and on the old terms, subject to any revision which may be made by their competitors. This looks uncommonly like playing favorites. For, at other points, men have been constrained to lose their pay as from the 1st May and not only to lose their pay but to continue on strike without any prospect of adequate strike pay being forthcoming. It is needless to emphasize the embarrassment this has caused to storekeepers and others in the localities where the men are out on strike. But there is reason to think that some of the men themselves are getting very restive. The truth is, they feel they have been played the fool with. Most of them must realize that some cut in wages is bound to come, and that every day's delay is likely to make the settlement, when it is made, a worse one from their point of view, because every day the cost of living is going down and hence wages are increasing in purchasing power. So that today the grounds for resisting a cut in wages are not as strong as they were two months, or even one month, ago. At one centre, about the midle of April, the men were offered a year's agreement with a fifteen per cent. reduction only. They refused this, however, and now they will have to take their luck with the rest. It looks very much as though, by the time a settlement is reached, the men will have some cause of complaint as to the "generalship" which has been shown on their side.

Mr. George M. McKee, of the Dounacona Paper Company was in Montreal this last week.

Fifty printing plants at Buffalo, N.Y., representing 90 per cent. of the city's productive capacity, have announced an agreement to maintain open shop and operate on a basic 48-hour week. Union demands, the announcement says, are entirely unjustified by existing economic conditions," and the agreement signed pledges with fifty firms not to enter agreement with any labor organization covering hours, wages or conditions of employment. The union printers have been on strike since May 1 for a 44-hour week.

Since the Directors' Committee on May 6th sent a circular letter to the shareholders of the Riordon Company informing them that their company was in a desperate position, and that unless they subscribed to the new bonds being issued to tide the company over its temporary position, liquidation was the only recourse, numerous enquiries have been coming in asking for additional information on the company's assets, its annual interest charges and its earning power in periods of depression, a reply to the request has been compiled by the Royal Securities Corporation and went forward to shareholders of the company this week over the signature of I. W. Killam. The letter is encouraging. It states that at a very conservative figure the company's properties are sufficiently valuable to cover the debts of the company and leave $15,000,000 for the $10,000,000 8 per cent cumulative preferred stock. An authority on valuations of such properties states the figures given in the letter are conservative; the letter itself has the air of being so at least. After valuing the properties at cost, for example, it goes on to say that as the Kipawa plant was built at the top prices it had been thought advisable to subtract $5,000,000 from its valuation; the timber limits of the Gatineau, which have been considered the finest in Canada taken as a whole, are put in at $1,000 per square mile, making a total of $12,000,000 as the valuation of the company's forest lands. Altogether the company is valued, apparently on a conservative basis, at $42,500,000 against a bonded indebtedness, including the Gatineau Company, of $27,000,000.

The annual meeting of the Canadian Consumers' Casein Company, an organization for the supply of casein to the paper users of that product, including the manufacturers of coated papers, was held in Toronto few days ago when favorable reports on the year's business were submitted. The following officers were elected: President, W. C. Copping, St. John, Que.; vice-president, C. N. Ramsay; secretary, H. Gage; treasurer, I. H. Weldon. The company's plant is at St. John, Que. and the annual statement showed that while the last year had shown a lessened turnover, a satisfactory volume of business was done.

Messrs. Warkwick Bros. & Rutter, manufacturing stationers, King Street, Toronto, have just put out a new line of manufactured stationery under the brand name of "Blue Bird", each of the sheets and envelopes bearing an embossed reproduction of a blue bird, which is the symbol of happiness. People who are learned in ornithology know that the blue bird is an inhabitant of Pays Bleu, the fabulous country of our dreams and is an ancient symbol of the folk lore of Lordane. The stationery is put up in pads, papeteries and envelopes and is particularly attractive and artistic. That it promises to be a popular line is indicated by the fact that the first run was entirely sold from samples in Warwick Bros. & Rutter's show rooms before it was off the press.

Mr. George Davidson, Toronto representative of the Howard Smith Paper Company, has gone on a business trip to the Pacific Coast.

Mr. J. G. Gibson, secretary of the Spanish River Pulp and Paper Mills, Limited, has returned from a business trip to Chicago in connection with the bonds of the company.

Col. Thomas Gibson, vice-president of the Spanish River Pulp and Paper Mills, Limited, and also president of the Aero Club, Toronto, met the Santa Marie, the sea plane which is making a flight from Detroit to New York and was a passenger in the craft from Toronto to Buffalo. The plane carrying several passengers landed on Toronto Bay and the crew spent some time in the city before continuing their journey.

EXECUTIVE COMMITTEE OF T. A. P. P. I. HOLDS MEETING.

The first meeting held by the executive committee of the Technical Association of the Pulp and Paper Industry, since the election of George E. Williamson as president, took place at the Strathmore Inn, Woronoco, Mass., on Thursday, May 5, and lasted over Friday. There was a full attendance of members and former president Raymond S. Hatch, was also there to assist the new president. Mr. Williamson is chief engineer of the Strathmore Paper Company, which has mills at Woronoco as well as at Mittineague. The Strathmore Inn is maintained by the company for the comfort of executives and heads of departments and a wing of the building was set aside for the use of the executive committee of T. A. P. P. I. for the duration of their meet-

Much Constructive Work Transacted.

It is safe to say that at no previous meeting of the executive committee of T. A. P. P. I. has so much work of a constructive character been transacted. Plans of a Service Committee for the conduct of group meetings of the association were adopted and arrangements made for the fall meeting of the association to be held under the joint direction of T. A. P. P. I. and the American Pulp and Paper Mill Superintendents' Association at Washington, D.C., York and York Haven, Pa., and Philadelphia, October 18, 19 and 20, 1921. Fred. A. Curtis, Paper Section, U. S. Bureau of Standards, Washington, was named general manager of the meeting for T. A. P. P. I. and he will be assisted by Grellet N. Collins, Philadelphia, and others. Owing to an expected attendance of upwards of 500 members and an already extended programme of mill visitations, etc., it was found necessary to curtail the entertainment features to some extent. It was arranged that trips to York, York Haven and Wilmington be made optional for Wednesday, October 19. This curtails the session in Washington to one day, Tuesday, October 18, but members could arrange to reach Washington on Monday, October 17, and spend the day in seeing the sights of the Capitol.

New Standing Committees Named.

Other business transacted by the executive committee included the appointment of standing committees of the association for the ensuing year, the adoption of a budget and passing on estimates of income and expenditures. Action was taken on a request by the Cost Association of the Paper Industry for an investigation of depreciation in values of machinery and apparatus, a special committee of the association to be named for the purpose.

SWEDISH AND EUROPEAN PAPER MARKET.

The newsprint paper industry in Sweden is facing a most unsatisfactory situation at present. Foreign buyers are not willing to pay Swedish prices, and old customers in England and America are not sending in new orders. Frequent cancellations are reported. Since November 1, 1920, France prohibits the general importation of newsprint paper and has invested La Société pour l'Approvisionnement de la Presse Française (Society for Supplying the French Press) with the sole right to make importations. French consumers as a result pay a price corresponding to that of the French product.

In Switzerland the domestic paper industry has suffered seriously from the importation of German paper. It is reported that two well-known paper manufacturing firms, Oser & Co. and Stöcklin & Co., Basel have shut down. German prices are lower than the cost price of Swiss paper.

Swedish operators in 1920 made plans for a production of 175,000 tons of newsprint paper in 1921. They have been forced to curtail their estimate to about 125,000 tons. The exportation of wood pulp decreased to 8,800 tons in February, 1921, as compared with 38,400 in February, 1920, and 63,000 tons in December, 1920. The exportaton of paper in February, 1921, was 13,600 tons, as compared with 20,300 tons in February. 1920.—United States Commerce Reports.

EXPERIMENTAL MACHINE MAKES COMMERCIAL PRODUCT.

An illustration of what an experimental mill can be in a commercial way is well demonstrated by the quality of filter paper which is now being manufactured by Arthur D. Little Inc., at Cambridge, Mass. A sample of this product which has just been received, shows it to be an exceedingly well felted uniformly close grain paper of excellent texture and filtering quality and particularly free from mineral matter. The ash content of a 9 cm. filter is only .00004 grams, which makes as good a quantitative filter paper as can be obtained anywhere. It has doubtless taken the Little Laboratory a lot of pains to perfect the manufacture of this special paper, which has heretofore been imported, but the successful development of the process proves the feasibility of the continuing from the experimental to the commercial stage and not only points out the advantage of scientific research in the paper industry but also shows that such a plant as that of the Forest Product Laboratories in Montreal can be used for the manufacture of some special grades, at least for Government use, for which it would not be profitable to divert the full size equipment of the ordinary paper mill. We do not advocate Government competition with ordinary business or manufacturing, but we believe that the Government institution is not only justified but should be encouraged in using equipment owned by the people to produce at least some of the material required for its own use. We also advocate more extensive application of scientific research to the problems of the Pulp and Paper Industry and the support of that industry for the facilities available and to be offered by departments of the Canadian Government.

The A. D. L. quantitative filter paper is being sold by Arthur H. Thomas Co., Philadelphia.

UNITED STATES NOTES

Alaskan development plans—particularly those having to do with the establishment of the paper industry there—are receiving increasing attention. In a letter discussing the bill which proposes the creation of the Alaskan Development Board, Secretary of Agriculture Wallace, summarizes the situation in the Northwestern territory as it affects paper-making. He says: "In January last, a small pulp plant began operation in Alaska under a national forest purchase. Two large tracts of timber are now being advertised for sale upon application from interests which contemplate the building of complete newsprint paper mills. Other applications are pending, and there seems a fair prospect that the paper industry will be established in Alaska just as rapidly as market and transportation conditions justify. The purpose is to put the making of paper in Alaska on a sound and continuing basis, developing a perpetual industry by limiting manufacturing capacity to the raw material which the forest will continue to produce."

It is considered likely that the present Administration at Washington will take some action toward removing the restrictions on Alaskan pulpwood lands. President Harding, himself a former newspaper publisher, has evidenced much interest in the reopening of Alaska. The question has come up several times in the cabinet and it is understood that high Government officials feel that the restrictions have probably been carried too far to allow the proper development of these valuable lands. Recommendations are to be made to Congress as soon as an investigation now under way is completed.

The Alaska Gold Mines management has decided to discontinue mining and milling operations and enter the paper making field if satisfactory arrangements can be effected. Negotiations now under way may result in the creation by other interests of a wood pulp and paper industry at the location of the present mill. The company's hydro-electric power development and the question of its further utilization is believed to have led paper making interests to try and establsh at the mine plant. Steps are being taken by the company to dispose of mine equipment and such portions of other facilities and materials as would not be useful in pulp and paper making.

Forest fires, which raged for the greater part of a week in the Adirondacks, were checked last Saturday after considerable damage had resulted, mostly in Franklin County. The greatest amount of damage was said to have been at Meecham Lake, where 800 acres of pulp wood were burned over, and at Cranberry Lake, where a tract of 200 acres, at last accounts, was still ablaze. These two fires, it was reported, had caused more damage than any forest blaze since 1919.

According to J. H. Coverly, secretary of the Los Angeles syndicate interested with Washington B. Vanderlip in Russian concessions, Vanderlip, who is now in Russia, has obtained from the Soviets Kamchatka contracts guaranteeing to the United States lumber rights from which can be secured enough news print pulp to replenish the rapidly vanishing American supply. "It is my understanding," states Mr. Coverly, "that Mr. Vanderlip has this concession, which is entirely independent of the 400,000 square miles of territory which he contracted for on the Kamchatka peninsula, under a contract by which it should be possible for operations to start almost immediately. He has a number of experts working with him on the different problems connected with the concessions."

Christopher Traeger, of Owens & Traeger, Hoboken, N.J., manufacturers of paper boxes of all descriptions, advises users of paper boxes and containers to enter the market for the purchase of their supplies at the present time because prices are about right and buyers will find that they can get them at a much lower figure during the present lull in the trade than they could in the immediate future. The universal use of paper boxes makes the business of Traeger's company an excellent criterion of trade conditions, and the increase in its business in the majority of the lines for which it makes containers is an indication of the steady improvement of general business conditions.

The strike of paper makers begun early in the month continues without any sign of a settlement. Reductions have been acceded to by workers in mills not parties to the expired international agreements, but there have been no arrangements or conferences having to do with the adjudication of differences that led to the walkouts in leading mills several weeks ago. Publishers of the big metropolitan dailies assert that they face no immediate danger of print paper shortage due to the strike. Some of them claim that they have enough newsprint on hand to last them quite a while. C. C. Lane, manager of the New York "Evening Post," intimates that manufacturers, in his opinion, may not be too anxious to see the strike end too soon since it would be to their advantage to have the price of their product recover from the slump in which it had fallen. The strike, he thought, might possibly scare up a few more buyers.

RESEARCH WORK IN ENGLAND.

The Imperial Institute in London has had a report submitted on the investigations (at the Institute) into spent wattle bark as a raw material for use in paper making. A company in Natal is now making arrangements to produce paper from the spent bark obtainable from the tanning extract factories. Steps are also being taken to prepare pulp from papyrus in Zululand.

Posidonia fibre, found on the foreshore of the Spencer Gulf, South Australia, is also mentioned as a suitable papermaking material. At present it is being developed and used in textile purposes and a company is utilizing the fibre.

Pulp from Bamboo is receiving more attention recently, but we must wait for Mr. Raitt's paper on the subject. Mr. Raitt, some months ago, before leaving for India, prepared an interesting paper bringing the subject up-to-date, and as he is one of our greatest authorities we must submit to the inevitable. His previous paper appeared in the "Pulp and Paper Magazine" before 1914.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, May 21.—With a number of the newsprint mills shut down and manufacturers of other grades of paper running light, the pulp and paper situation is in an unsettled state, although from a jobbers standpoint there has been an improvement in the turnover in some lines. As yet, the shut down of the newsprint mills on account of labor difficulties, has had no effect on prices, although, should these wage troubles become protracted and the supply become shortened, a rise in the market would undoubtedly come. Spot lots of news are now selling at 5 cents and as high as 6½ cents and 7 cents. In the pulp field comparatively few transactions are taking place and stocks at the mills are piling up.

WRAPPING PAPERS.—Generally speaking there is a decidedly better tone to the wrapping paper trade, there having been a gradual improvement in business during the past few weeks. The jobbers report that orders are coming in more freely than for some time past and are very optimistic as to the future. The whole tone of the trade is one of greater confidence and there is a more generous response to the salesmen's efforts. Travellers for wrapping paper houses who were in over the last week-end brought in a fair volume of business and reported the outlook for better business as being very good. The northern part of Ontario is proving productive of some very fair business and consumers generally are showing a greater disposition to buy. Stocks, in the hands of the jobbers, however, are light and the mills are not receiving orders of large dimensions.

Although buying is still somewhat cautious, the kraft mills report evidences of a returning confidence in the market and a fair amount of the product is being disposed of. The mills generally are said to be running pretty close to capacity, particularly those mills, like Wayagamack, which are devoted exclusively to kraft. Although there is reported to be considerable stock on hand it is beginning to move more freely and dealers are optimistic as to the future of the trade in this line. During the boom days kraft was being sold as a substitute for manila when that paper was a scarce commodity under an abnormal demand, but now it is back again on its own footing and is becoming firmly established. Prices, both in respect to the paper and kraft pulp remain unchanged from the quotations of last week.

CASEIN.—The market for casein, which is extensively used in the manufacture of coated paper, continues to decline and is now down almost to a pre-war basis. Whereas casein reached twenty three and twenty four cents during the fat years of the paper trade, it is now down to 11c per pound. Most of the paper mills are reported to have considerable stocks on hand.

COATED PAPER.—Coated paper manufacturers are complaining of a slackness in trade although some of the mills are doing a fair amount of business. One leading manufacturer said that he did not look for any great improvement in conditions before next spring and this seems to be representative of the prevailing impression respecting trade in general. The price of No. 1 coated paper during the boom period reached as high as 21½ cents and 20½ cents for No. 2. Today the prevailing prices for the three leading grades of coated stock, F. O. B. mill are: No. 1, $16.35; No. 2, $15.35 and o. 3, $14.60 per 100 lb.

MANUFACTURED STATIONERY.—Although the manufactured stationery trade is passing through a quiet season some of the firms are getting some nice business in the school book line. This is the season when the various boards of education stock up on scribbling books and other school supplies and the manufacturing stationers say that this line serves very nicely as a filler between seasons. The demand for school supplies this season is satisfactory. Manufacturers of papeteries are now booking fall orders and trade in this line is good, although business is rather dull in the blank book department. Most of the manufacturers are fairly busy in their plants and are turning over a fair amount of business. The old days of difficulty in getting raw stock and at reasonable figures are now but a memory and the manufacturers report that both Canadian and American firms are active in their canvas for business.

GLASSINE AND GREASEPROOF.—Manufacturers of these lines report that business is quite and although a fair number of orders are coming through they are of small dimensions, indicating that the consuming trade is still following a hand-to-mouth policy in the purchasing of their requirements. Waxed papers are a strong competitive line and manufacturers of both lines are keen after business. No price changes have taken place recently.

NEW YORK MARKETS.

New York, May 21—(Special Correspondence). — The paper market has developed little change of note this week. If anything, trade activity is on the rise, though the improvement in demand is slow as consumers continue to buy only when pressed by necessity, being as yet unwilling to anticipate requirements. It is plain that the great bulk of paper now being absorbed by buyers is going direct into consumption, which condition, while making for a rather quiet market situation, gives a very healthy tone to such demand as exists. Jobbers are still purchasing paper and board from mills only when having customers' orders to fill, and all down the line current buying is restricted to immediate wants.

An encouraging feature is that matters in the printing industry are on the mend. Heads of several of the largest printing establishments in New York stated this week that inquiry from buyers of printing is increasing quite rapidly, giving the impression that activity in the printing trade is on the threshold of expansion. It is stated that inquiries in regard to catalogues, particularly those printed in foreign languages, were especially numerous, and it can be said that everything points to an appreciable increase in operations in the printing industry in the very near future, thur leading to a larger consumption of paper of a variety of descriptions.

The newsprint market, while fundamentally un-



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INQUIRIES SOLICITED:

changed, is daily acquiring a firmer undertone. Publishers are still reluctant in most instances to add to their stocks of paper, and yet some of them are looking about the trade for available spot supplies and are said to be buying fair-sized quantities of newsprint when it is to be had at what they consider acceptable prices. There is no change in the strike situation, so far as has been publicly announced. Mills shut down by the labor trouble are refusing to issue quotations to other than regular contract customers, and those publishers who depend on open market purchases for their supply of print paper are obliged to do considerable "shopping" about the trade before locating available stock.

Prices on newsprint are steady. Those on spot deliveries to transient buyers range between 5.50 and 6 cents per pound at mills, and most transactions are at the higher figure. Everyone appears to be conserving stocks of newsprint, presumably in the fear that should the strike last for a sufficient length of time, a scarcity of paper would result, and offerings are far from numerous or voluminous. Contract quotations hold at 5 to 5.50 cents and, as stated above, few mills are quoting except to regular customers.

There is no increase in demand of importance for books papers. Supplies are moving in fairly steady fashion to contract buyers and there is the usual routine open market business passing, but buying generally is narrow. Manufacturers are maintaining quotations but, as would be expected under prevailing circumstances, they are frequently accepting orders at price concessions. Evidently book paper producers do not deem it good business judgment to turn down orders at slightly under the figures they quote in view of ruling conditions, and it is understood that they are advising jobbers and distributors to bid whatever prices they consider reasonable enough to land the business and that they will agree to take the order so long as the price stipulated is not too low. This same policy is being practiced in various branches of the paper trade—by manufacturers of fine papers, wrappings, boards and other kinds of paper.

Demand for coarse tissues remains good, and there is a fair trade current in fine tissues, with prices sustained at a basis of around 95 cents per ream on No. 1 white tissue, 20 x 30. Wrappings are moving in moderate quantities, with some jobbers reporting a pick up in demand for kraft paper. No. 1 domestic kraft is quoted on an average of 7 cents a pound though some mills are taking orders at a quarter to a half cent below this figure.

The downtrend in fine paper prices has not been checked, judging from reports of further reductions announced by some mills. It is difficult to name exact quotations on writing and ledger papers for the reason that prices depend on the stock involved in individual transactions. A good grade of sulphite bond can be bought today at 14 to 15 cents per pound for white, while a fairly high quality rag bond is available at from 25 cents upward.

As previously reported, the box trade is showing a little more life. Boxmakers are laying in stocks of board evidently with the idea that better business conditions lie ahead and that board costs are down to about as low as they will go. Quotations are a bit firmer in tone though not actually changed, plain chip being offered at $30 per ton at mills and filled news board at $35 and less.

GROUND WOOD.—The mechanical wood pulp market displays a firmer tone that has been apparent in a long time. While buyers are rather reluctant to absorb sizable tonnages of pulp, the fact remains that a good many of them are looking about the trade seeing what stocks are available and at what prices supplies are to be had, and this makes for a stronger sentiment. Producing mills in a majority of cases seem to be holding on to surplus stocks, probably in anticipation of a shortage of ground wood should the strike of paper and pulp mills workers last much longer, and offering is at a fairly low point. Quotations are on a comparatively broad range, most domestic grinders asking in the vicinity of $35 per ton at shipping points with reports heard of offers by Canadian producers down to around $25 at grinding plants.

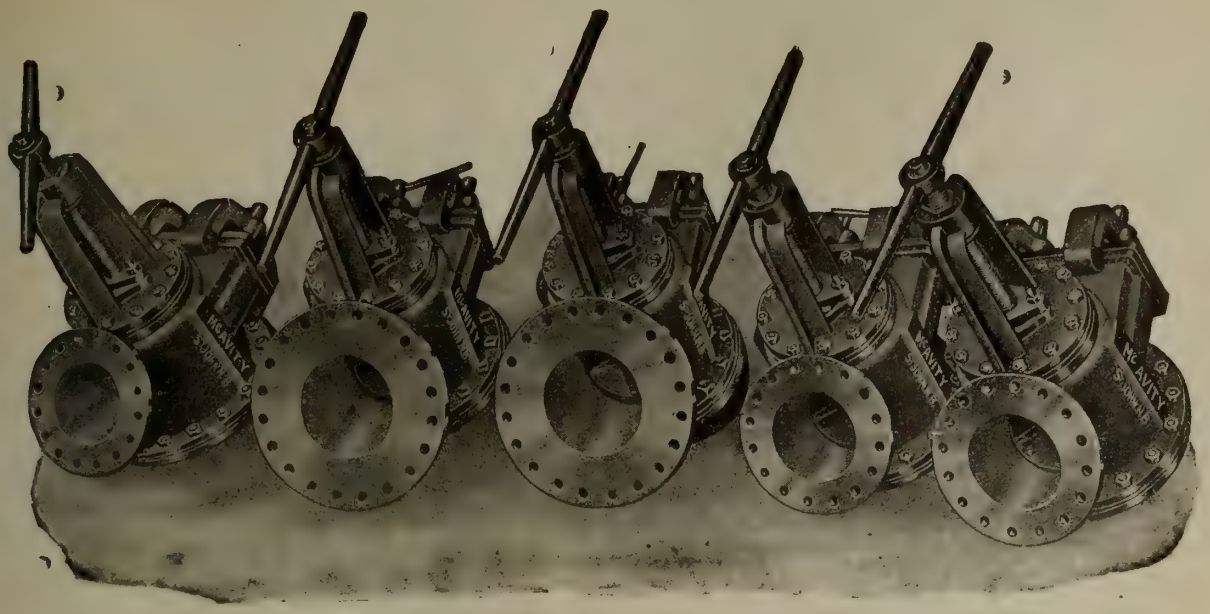
CHEMICAL PULP.—On the whole the market for chemical wood pulp presents a quiet appearance, yet there is more buying interest evinced in several grades and prices on these kinds of pulp seem to be stiffening. New grade sulphite is probably the firmest item in today's market and the reason for this apparently is the shut down of pulp mills making this grade of pulp and the resultant decrease in production, thus attracting consumers into the market in search for supplies. Domestic producers are said to be freely refusing $70 and $75 per ton on news grade sulphite; a majority of them asking around $80 and seeming willing not to make sales unless receiving this price. Easy bleaching sulphite is fairly steady at 4.50 to 4.75 cents a pound for domestic grades, and kraft pulp is holding in price at around 3.75 cents on No. 1 domestic kraft.

Very little foreign pulp is coming into the States at present, and trading in Scandinavian fibre is at a low level. Occasionally a sale of spot sulphite or kraft is reported at a rather low price, but otherwise busi-

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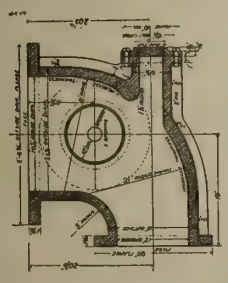




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ness in this end of the pulp industry is close to a standstill.

RAGS.—Paper mills continue to buy rag stock in spasmodic fashion and at best in small quantities. Dealers assert that not in many years have they witnessed such a long drawn out period of dullness and are wondering when the market will open up in something approaching normal proportions. Aside from several grades, notably roofing material, on which prices are fairly well established, values are altogether nominal, depending on how anxious the packer is to dispose of stock or how desirous the mill is to get a certain grade of goods. Satinets are moving to felt mills in a moderate way at around 75 cents per hundred pounds at shipping points on No. 1 packing and 65 cents on No. 2 stock, and there are scattered sales of old whites and some kinds of new cuttings, but aggregate business is of small importance. Offerings of new No. 1 white shirt cuttings at 10 cents a pound and of No. 1 new washables at 5 cents have been noted, while old No. 1 repacked whites are available at 6 cents and repacked thirds and blues at 2 cents. New blue overall cuttings and new light silesias are quotably lower, the former being offered at 6 cents and the latter at 6.50 cents at shipping points.

PAPER STOCK.—Most grades of old paper show a firmer price tone and slight advances have been scored by prices in quite a few instances. Soft white shavings of No. 1 quality which a short time ago were selling at 2 cents a pound are now held for at least 2.25 cents at shipping points, with some dealers refusing to accept orders on this basis. Magazines are quoted higher at about one cent per pound, while old kraft paper is held for a minimum of 1.60 cents and white blank news cuttings at 1.50 cents. Folded newspapers are unchanged in price at between 35 and 40 cents per hundred pounds, but are under better inquiry, while No. 1 mixed paper continues to move at 25 to 30 cents a hundred at dealers' points.

OLD ROPE AND BAGGING.—Consumers have let up in their buying of old rope to an extent but the market seems fairly well sold ahead and prices are firm at around 4 cents per pound on Manila rope in No. 1 condition. Scrap bagging is mostly neglected and prices are uncertain and mainly nominal, with No. 1 scrap readily available to mills at one cent per pound f. o. b. shipping points.

VISITED LINTER PULP PLANT.

The Stamsocott Company at Hopewell, Virginia, the manufacturers of paper pulp from cotton linters had the pleasure of entertaining a group of representatives from practically all of the high quality paper mills located in Massachusetts on May 5th, 6th and 7th. There was considerable mutual benefit derived from this visit, as steps were discussed and agreed upon for preparing linters in a more suitable manner for the various paper companies. Considerable strides have been made in the development of cotton linter pulp, and it was the universal opinion of all the gentlemen present that this material can be counted upon as a permanent high grade paper making material.

Australia has reduced the import duty on: White tissue paper used for wrapping boxes of confectionery; paper cones for hosiery; and fibre board for binding books.

FISCAL AND TRADE NOTES FROM NORWAY.

By Commercial Agent C. E. SONTUM,
in T. & C. Bulletin.

Norway's Trade Returns.

Christiana, Norway, March, 1921.—From January, 1920 to January 1921, imports decreased from 206 to 124 million kroner and exports from 86 to 68 million kroner. The decline in imports embraces practically all kinds of goods and commodities, with drapery showing the greatest falling off. The recession in exports is chiefly in fish and paper, and, to a lesser extent, wood and chemical products.

It may be presumed that imports will continue to decrease, at least as far as values are concerned, owing to the fact that prices are steadily falling and that the value of the Norwegian kroner is, though slowly, improving. An important factor in the situation is that, as consumers are buying only what is absolutely necessary, a continued recession in prices is confidently anticipated. A wave of economy has passed over the buying public, and they are now purchasing only cheaper qualities of goods, which of course has a strong reflex influence on import values. Further, the import prohibition still in force on all kinds of luxury has now become effective, as practically all goods ordered previous to the prohibition have now been imported, and no import licenses are granted for fresh orders.

The fall in the value of exported goods is, of course, chiefly due to decrease in quantity, but declining prices also are not without their influence on the statistics.

Commodity Price Index.

The trade paper "Farmand" notes that the price index figures for March only show a decline of 2.7 against those for February, and makes the following comment: "After a violent fall in prices over a period of five months, the natural reaction has begun. The decline has come to a preliminary stop, but still we must go through a long process with falling retail prices and decrease in the cost of living and in labour wages. If this necessary process should be arrested, wholesale prices must rise, i.e., the Norwegian currency must again go down."

Norway's Wood Trade.

Notwithstanding a number of inquiries, especially from England, for telegraph poles, and from Holland for pile work, there is practically no business doing. Buyers consider prices too high and point to Finland as an alternative market, where owing to low exchange value timber is sold at considerably lower prices than those of her competitors.

Pulp and Paper.

The wood-pulp market is absolutely lifeless, with no prospects of improvement. The mills have therefore decided to close down for one month beginning on April 9, after which suspension resumption of work will be on a scale dictated by the position of the market. Swedish producers are expected to follow the same policy as tho Norwegian.

Norwegian exporters do not take an optimistic view of the paper market situation. Recovery is more of a hope than an anticipation, as the many inquiries made are with the object of sounding the market rather than with the intention of doing business. Notwithstanding the heavy drop in prices which has recently taken place, no improvement is likely until the present large stocks have been considerably reduced.

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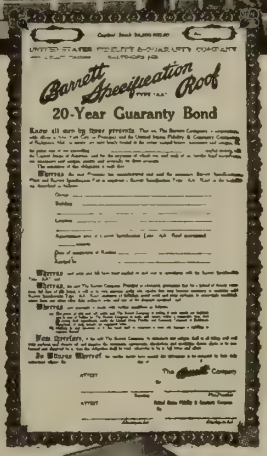
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General View, left to right: Oldsmobile, Enameling, Shipping and Storage

News From Our Advertisers

S. A. McLERNON JOINS C. F. M.

The new head of Pulp and Paper Mill Machinery and Supply Department of the Canadian Fairbanks-Morse Co., Limited, succeeding Wm. Whyte, who recently resigned to undertake new sales work on his own account, is Mr. S. A. McLernon.

The Canadian Fairbanks-Morse Co., Limited, were sorry to receive the resignation of Mr. Whyte and wish him every success in his new undertaking. At the same time, they feel particularly pleased to secure a man like Mr. McLernon to take his place.

Mr. McLernon is a graduate Engineer of Victoria University, Manchester, England. His experience has been almost as wide as the British Empire. After experience in England, he spent some time in Civil



MR. S. A. McLERNON,

Manager, Pulp and Paper Machinery Dept., Canadian Fairbanks-Morse.

and Mechanical Engineering with Jas. J. Niven and Co., New Zealand.

His first work in Montreal was Assistant Chief Engineer of Construction on Mount Royal City. The past eight years he has passed in various capacities with the Canadian Explosives, Limited. He has performed important work in connection with the construction and operation of several of the Explosive Company's largest plants. For the last three years he has held the post of Chief of the Light, Heat and Power Division in addition to being in charge of all mechanical construction undertaken by the company.

Mr. McLernon brings to his new position a wonderful experience which is being offered to the Pulp and Paper Mill industry through The Canadian Fairbanks-Morse Company. He will find many good friends in this industry.

Victor T. Goggin, late New England Sales Manager of Fred T. Ley and Co., Inc., of Springfield, Boston and New York, has severed his connection with that concern to associate himself as Contracting Engineer with Dwight P. Robinson and Company, Incorporated, of New York, Chicago, Dallas, Youngstown, Los Angeles and Montreal.

NEW ASBESTOS GYPSUM HOOD ANNOUNCED.

The trade will be interested in the announcement found in this issue, of a new development in the form of a paper machine Hood for which the inventors claim distinctive advantages, not the least of which are the fireproof and dripproof features.

H. S. Taylor, Ltd., 302 Guarantee Bldg., pulp and paper mill engineers of Montreal, have designed and perfected this unique innovation which it would seem cannot fail to hold an interest for all paper manufacturers.

Among the advantages which the advertisement announces are the facts that this hood is especially adapted for replacement and can be installed without special shutdown. It is light in weight, practically indestructible, easily ventilated thus helping to realize ideal machine room conditions, guaranteed not to drip, low first cost and no maintenance cost, offers great saving in felts, and is endorsed by the underwriters. Further particulars may be secured direct from the H. S. Taylor Ltd., as named above.

C. I. R. BULLETINS ARE BEAUTIFUL.

Two more units in the series of bulletins on pulp and paper machinery manufactured by the Canadian Ingersoll-Rand Co., have been received. These bear the numbers P.M. 113 and 114 and refer to the Ryther improved parallel endless chain log haul and the 2 and 4 plate Bird auxiliary screens. Each of these types of equipment is found illustrated not only in detail as to the various parts but also a typical arrangement and a typical installation are very clearly illustrated and described. It is particularly gratifying to note that these bulletins, which exemplify the first type of printing are produced entirely in Canada by Canadian press work on Canadian coated paper. The printing is in three colors. Copies will be sent to the Superintendents and other responsible officials, on application to the company at their offices in Montreal or elsewhere across the continent.

NEW A. P. & P. A. EXECUTIVE MEETS.

The first meeting of the new executive committee of the American Paper and Pulp Association was held Wednesday May 18, and was featured by the enrollment of two additional associations as affiliated with the parent organization. The two associations which have been affiliated are the Gummed Paper Manufacturers Association and the Glassine and Greaseproof Paper Manufacturers Association.

Both associations are represented on the Executive committee of the American Paper and Pulp association by their presidents, L. T. Stevenson of the Mountain Mill Paper Company of Lee, Mass., representing the glassine and greaseproof association, and C. H. Cromwell of the Cromwell Corporation of Brocklyn representing the gummed paper group.

There was quite a general attendance of the members of the executive committee, and the problems of the coming year were discussed with a view to laying out definitely the work of the association for the year.

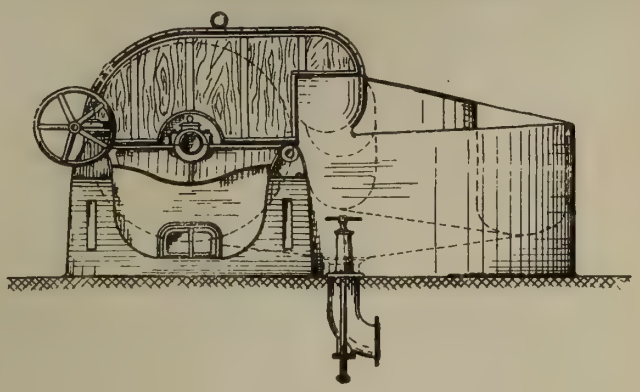
J. T. Carey, President of the International Brotherhood of Paper Makers, puts the number of men out in all branches of the paper making industry at 40,000. He says that no further conference between representatives of the unions and of the employers are in immediate prospect.

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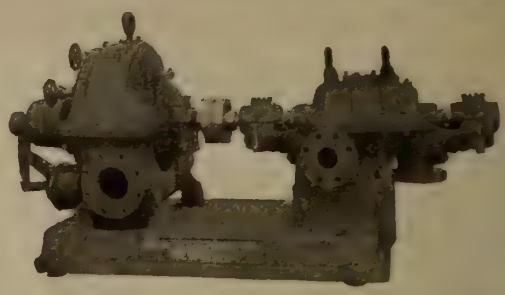
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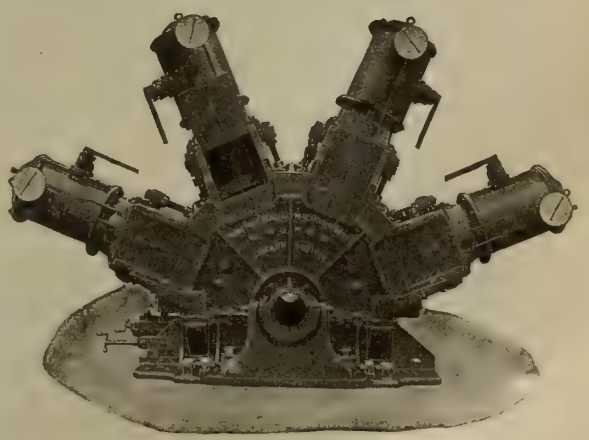
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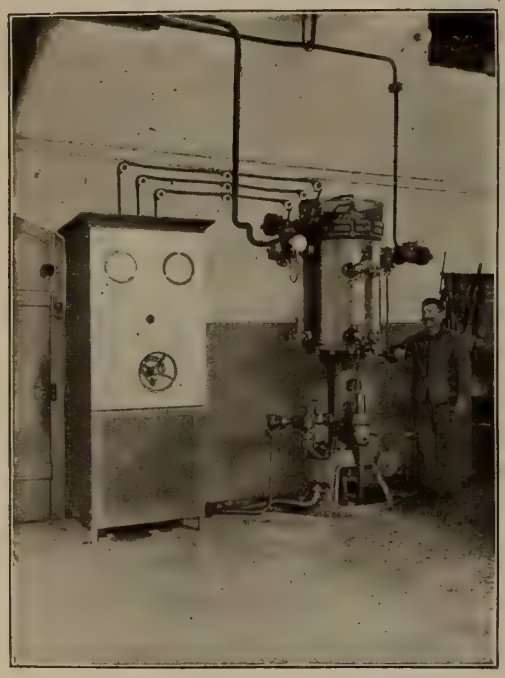
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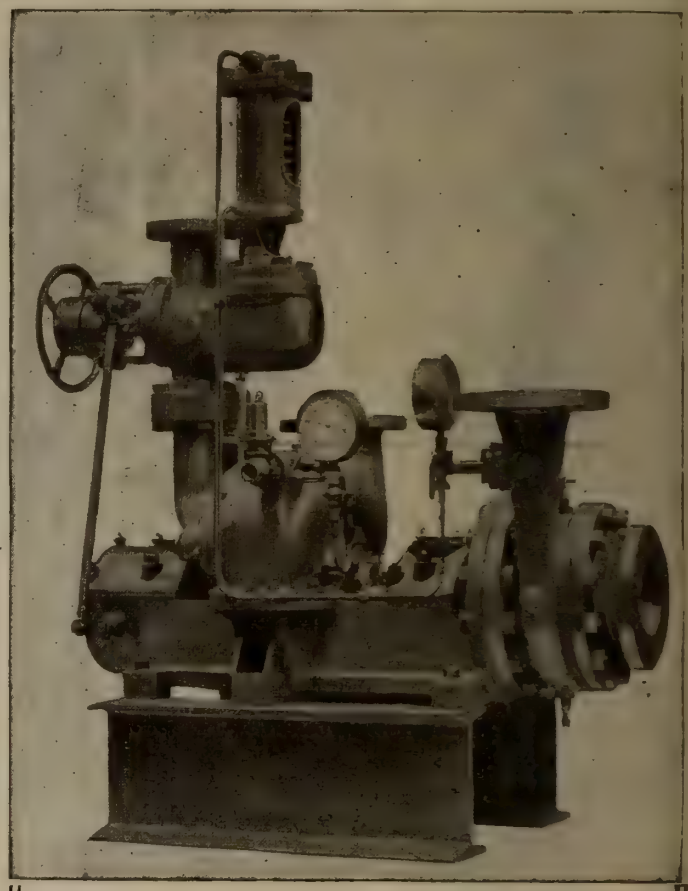
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VOL. XVIX. GARDENVALE, P. Que., June 2nd, 1921. No. 22

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

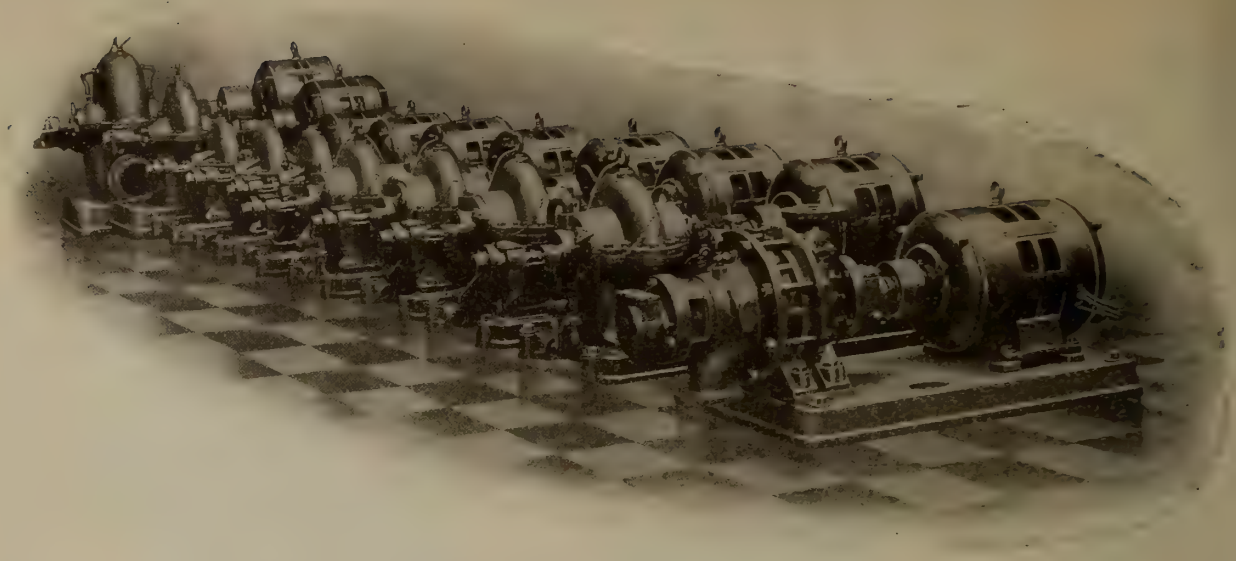
Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

CONSIDER THE CLOCK.

The thought occurred to us the other day, that industry is pretty much like a clock, it goes when every parts is performing its proper function, but will be difficult indeed to select any one part as being solely or completely representative of any particular section of the community. The only appropriate comparison at the present time, seems to be the suggestion that the so-called working class is represented by the striking mechanism, whereas a happier illustration, if it could be properly applied, would be to compare the worker with the train of gears which transmits and applies the source of power to the object desired. It might not be inappropriate to let the balance wheel represent the management.

Rather too much has been said of late along the line of comparing the industrial situation to the swinging pendulum. While it is true that in some styles of timepiece the application of the law of gravitation to the motion of a pendulum is made use of as a regulator, it is also true that a similar oscillating movement of industrial circumstances does not regulate but retards the progress of the industry. The pendulum of the clock is not a source of power and its function is equally well performed by a spring. The ever forward movement of the hands around the dial is accomplished by the application of power transmitted by the perfect mesh, and correct adjustment of the size, of the gears. The progress of industry is not dis-similar. Nature has furnished sources of power which may be the locked up energy of the sun in the ugly black lumps of coal or may be in the tons of glistening water seeking a lower level as they tumble over the ledges that obstruct the path of the river. The transmission of such power, or perhaps even the physical energy of men and animals for the production of some useful article of commerce from some otherwise useless raw material is the purpose of industry. This cannot be accomplished without co-operative effort in a complicated mechanism of the modern organisation of society. Every employer and every employee, every dollar of capital, every brick of construction and every wheel of equipment plays its part in the whole machine. If any part fails to accomplish its purpose, just like the breaking of a pinion or the clogging of a gear, then the clock stops. Let friction creep in, through any lack of "the oil of gladness" and cheerful and harmonious relations, through misunderstanding, misconception of purpose or individual or group selfishness and the mechanism slows down, just as the clock runs slow when dust gets in the bearings. We need to keep industry clean, we need to keep the bearings and every point of contact free from friction and obstructions. A clock can keep good time and mark the passing of eternity, without any strike, but the note of a clear tone bell, as each hour rolls round, does remind us that life is going on and is an urge to greater effort. So also in industry it is well to have some means of announcing and recording the progress of events as the clock of industry ticks off one accomplishment after another.

Organized effort, in almost every instance, makes greater progress and accomplishes larger results than individual effort. Even such necessarily individualistic endeavors as are marked by the marvellous inventions we have seen are usually of little use until organized work makes them available in practical form. There can be, however, organized effort other than with the idea of producing, or at least without the purpose of producing, material things. We have, for instance, political parties, we have safety organizations, we have public health bureaus, we have scientific associations, we have fraternal societies and social clubs, and, foremost in the line of social agencies, we have the church. We have also manufacturers' associations and workmens' unions. There will probably always be a difference of opinion as to the proper functions of such organizations.

It is not our intention to intervene in any way in the present controversy, but the fact must be obvious that the clock is stopped because the emphasis has been put on the swinging pendulum and the striking mechanism instead of on the necessity of keeping the rest of the works wound up and lubricated. Everybody knows that a clock cannot run if a single wheel stops, nor can any one element run the whole works. So in industry, the manufacturer or the merchant must work with his employees; they must work with him, and, unless he has been fortunate or frugal enough to have sufficient money of his own to carry on his business, he must borrow it from the banker, from the widow who has a life insurance, or from the workman who has savings, and these lenders must not only have confidence in the integrity of the manufacturer and merchant but they must also have faith in the loyalty and dependability of the employees of the concern. It stands to reason that such loyalty as will command the confidence of the public must be earned by the employer through his honorable and fair treatment of those who work for him—we should rather say, who work with him.

There are two sides to this matter of fair dealing just as there are two sides to most phonograph records. The employer must be willing to share his prosperity with

his workmen and they must be ready to stand by him when times are dull. We hear talk of the unwillingness of workmen to share the losses, as they always desire to share the profits, of a proposition, but it seems to us there is another way out,—that is, to pay fair wages at all times and in times of prosperity to lay by an extra amount in reserve against dull periods rather than distribute the whole excess in extra dividends. A fair and satisfactory wage can be based on the average cost of living and, where necessary, fluctuate with it. We know that most workmen would prefer continuous employment to an occasional bonus and no doubt the average shareholder would prefer a regular, though smaller, dividend to an occasional melon, but periods of no dividends must be made up from profitable periods.

At the present time, it looks as if several Unions on the one side, and several mills on the other, were each endeavoring to pull the pendulum and hold it at opposite ends of the swing. A little thought will show that a clock cannot possibly run under such circumstances nor can industry progress. They should leave the pendulum alone and concentrate their efforts on keeping the works running. If a clock-maker finds one wheel a little too big he files a bit off. If the clock runs too fast he slows it down. The same principle can be applied to industrial relations. Industry can be slowed down and speeded up where necessary without stopping its progress,—that is the function of the pendulum or the balance wheel. A strike does not help a particle and the part that runs the strike never runs the clock.

There is just one other point to mention which is that in slowing down industry, as in slowing down a clock, it is absolutely impossible to slow one part and speed another,—all must move in harmony. So in industry if we are going to have progress instead of a continual swinging backward and forward, first the employer grabbing all he can hold, and then the employee holding all he can get, we shall not have progress but a continual source of trouble. The application of one single principle of Christian Doctrine which the great majority of both employers and employees profess to believe—and probably do believe—would, in practice quickly and easily remedy the situation. It would require, however, that both parties must truly be honest. We believe that the time is approaching when neither the Trades Union nor the employer will be in a position to dictate one to the other but that organizations of both will make easier the mutual consideration of common problems and so bind industry together that more perfect co-operation and understanding will obtain in industrial life.

THE SUMMER MEETING.

The summer meeting of the Technical Section of the Canadian Pulp and Paper Association will consist this year of an inspection trip to the mills of the St. Maurice Valley. It was the pleasure of the section to visit some of these mills several years ago as the guests of the St. Maurice Paper Co., The Belgo Canadian Pulp and Paper Co., and the Laurentide Co. Since that time a new mill in the district is that of the St. Maurice Lumber Co., at Three Rivers. A description of this mill will be published next week. Recently the company at Shawinigan Falls has changed its name and is now the Belgian Industrial Co. Not only has the name been changed but the plant has also been altered. At Grand'-Mere what is without doubt the finest paper machine room in the world has been put into operation by the Laurentide Co. These new things but add to the pleasure and profit of visiting both our old and our new friends.

A change in plans which we believe to be a good one is inaugurated with this trip. At the previous meetings of the Section to the St. Maurice Valley and in fact at all of the summer meetings of the Section the mills in the localities visited have gone to a great deal of expense with regard to the accommodation and entertainment of the Technical visitors. There is no question but that this courtesy has been thoroughly appreciated but we have often thought that the entertaining features provided by the companies could be carried too far and become such a strain, especially as each succeeding visit has been taken as an opportunity and a challenge to outdo the last, as to discourage invitations to visit mills which would otherwise be glad to open their doors to the Section. What we have said of Canadian mills is equally true of the American mills that have entertained the Technical Association. Both organizations are growing and each visit means a larger party than before. The pleasure of visiting pulp and paper mills and the courtesy always shown by the companies is incentive enough to attract every live member of the Technical Section without the necessity of giving what practically amounts to a bonus to attend the meeting. We congratulate the Executive Committee for deciding that the trip this year will be a "Dutch treat". The expense will not be heavy and everyone who can possibly get away for the three day visit to one of the most important paper making centres of Canada should certainly be on hand at the Windsor Station on June 14th.—Advise the Secretary NOW.

COBWEBS.

Last week we had the pleasure of a visit from Mr. William Adamson and Mr. Harry Kay, of Charles Walmsley & Co. Mr. Kay has already spent some time in Canada. Mr. Adamson seemed impressed with the prospects of the industry in Canada and finds conditions here much better than in England. He is of the opinion that the 3-roll width will be the future standard for news machines It was rather amusing, when a small creature buzzed by, to be asked if that was a mosquito. Mr. Adamson went on to New York where the pests are said to attain enormous size and viciousness. He'll find out what they are!

It is expected that Mr. Percy B. Wilson, President of the Canadian Pulp and Paper Association, will honor the Technical Section by attending the summer meeting this year.

Automatic Speed Control for Sectional Paper Machine Drive

By STEPHEN A. STAEGE, General Engineer, Westinghouse Electric & Mfg. Company.

Paper is made from a pulp stock, consisting of cellulose fibers carried in suspension in water. It is transformed from this liquid mass into a smooth sheet of paper in one continuous operation on the "paper machine," which is the largest and most complex of the various pieces of apparatus used in the manufacture of paper from raw material.

The paper is formed on a wire screen upon which the pulp solution is evenly deposited. Part of the water gravitates through the wire screen, part is drawn through the screen by vacuum suction boxes and still more is removed by the passage of the semi-formed sheet between large press rolls. Finally, after about a third of the water has been removed in this manner, the paper sheet, now thoroughly fabricated, passes on to large revolving cylinders heated by steam, where nearly all of the remaining moisture is evaporated. From the drying cylinders, the sheet passes to the calender stack where it is ironed out to a glossy hard smoothness by its passage between numerous highly polished steel rolls, stacked one above the other, around each of which the paper is threaded. After leaving the calender the paper is wound into a large roll on a reel. It is later trimmed to the desired width and rewound into new rolls of the dimensions required for the ultimate user.

Paper machines are divided into two principal types, known as Fourdrinier machines and cylinder machines. The Fourdrinier machines are used chiefly for the lighter weights and thicknesses of paper, such as news print paper, book paper, etc., and usually operate at relatively high speed, whereas the cylinder machines are used for very light or very heavy papers, such as tissues, card boards, container boards, box boards, etc. In the Fourdrinier machine, the sheet is formed on a wide wire screen operating like a belt around two rolls, and driven by one of them called the couch roll, the pulp stock solution being deposited evenly upon the surface of this wire screen. In the case of the cylinder machine, the liquid pulp stock is deposited upon the surface of a revolving screen drum or in many cases upon a number of these revolving screens known as cylinder moulds, each of which adds a thin layer of pulp stock to a revolving felt, making a sheet of any desired thickness. The fundamental difference between the Fourdrinier machine and the cylinder machine is that, in the Fourdrinier machine, the sheet is formed upon the screen, called the Fourdrinier wire, whereas in the cylinder machine the sheet is formed on the cylinder moulds. The presses, dryers and calenders are similar in both machines. On account of the higher speeds at which Fourdrinier machines operate, many variations in mechanical design are found in the two general types of machines.

When passing between the press rolls, the thin, wet sheet is slightly elongated and in its passage between presses it is acted upon to a certain extent by the atmosphere, causing evaporation and a tendency towards shrinkage. This is also true in the passage of the sheet from the last press to the dryer rolls and through the dryer rolls to the calenders. On this account, it is necessary that the paper machine be so constructed that each of its component parts or units, that is, each of its press rolls, trains of dryer rolls and stacks of calender rolls can be operated at a slightly different speed, in order to compensate for the variations in the elongation or shrinkage of the sheet that may take place from time to time, due to changes in atmospheric conditions or to variations in the consistency of the pulp stock as it is fed onto the machine.

From this brief description of the paper machine, it will be seen that each section must be susceptible to individual speed adjustment and control. Moreover, the correct relative speeds of each of the sections must be maintained with great precision, or the paper sheet will quickly be broken.

The speed at which paper machines operate also varies greatly. In cylinder machines, the linear speed of the paper may be only a few inches or feet per minute or it may be two or three hundred feet per minute. The machines will vary in width from those which can produce a sheet of paper 3 or 4 feet wide to those which can produce a sheet 10 or 15 feet wide. Sometimes a single machine may be required to operate over a great range of speeds, varying from perhaps 10 or 15 feet per minute to 200 feet per minute, so that whatever method of drive is used, it must be capable of operating over a considerable range of speeds. Fourdrinier paper machines seldom operate at speeds lower than 50 or 100 feet per minute. The upper limit of speed so far obtained is 1000 feet per minute. Many machines, however, are operating continuously at from 600 to 700 feet per minute.

The most common method of driving paper machines has been by means of an engine with cone pulley speed changes, a variable speed engine, or an adjustable-speed direct current motor. Each of the several sections is driven from a common line shaft by reduction gears, belts and pulleys or some type of rope drive, the belts being made to operate with pullevs slightly tapered or conical in form, so that by shifting the belt toward one end of the pulley or the other, the required adjustment of speed for each individual section can be obtained.

Since the variations in load on any individual section at a given speed are not great, seldom exceeding 20 or 25 per cent, the belt can be depended upon to transmit the load with a fairly constant slippage, and therefore relatively uniform speed. Following every change in load transmitted, there is, of course, a slight change in the amount of belt slippage on the pulleys, which necessarily affects to a certain extent the "draw" of the sheet between the sections, caused by the difference in relative speeds between the sections which have taken place. It is well known that variations in belt slippage are also caused by changes in the humidity of the atmosphere, affecting both the tension of the belt and the co-efficient of friction between the two surfaces, or by water, oil or foreign matter of any kind reaching the surface of the belt or pulleys. On account of the liberal rating of the belts which are commonly used, the degree of variation of belt slippage has not been sufficient to interfere seriously with operations, although it does frequently cause breakages of the paper sheet as it passes from one section of the machine to another, and more often causes undue

straining of the sheet so that, while it does not actually break on the paper machine, it may break later while passing through printing presses.

Heretofore, mechanical drive has been used almost exclusively for the various sections of the paper machine. The reason motors have not been used for driving the individual sections, was because no means had been found whereby their speeds could be controlled accurately enough to prevent breakage of the paper, most of the trials of sectional motor drive having resulted disastrously. From the fact that the relative speeds of the sections have to be adjusted from time to time, synchronous motors are out of the question, and induction motors, on account of their inherent regulation characteristics, are equally unsuitable. Direct-current motors, on the other hand, can be designed to operate over wide ranges of speed, and offer great flexibility of control, and the only thing that has interfered with their general adoption has been the absence of a suitable type of speed regulator. Recent investigations have shown that, to prevent breakage or undue straining of the paper as it passes from one section to another, the variation of speeds between sections must be maintained, as an average value, within one-tenth of one percent. It is also necessary to raise or lower the speed of the entire paper machine by small amounts from time to time, without interfering in any way with the draw, or relative speeds of the various sections, and it is necessary, when changing from one grade of paper to another, to operate at widely different speeds; speed variations of 7 to 1, or even 10 to 1, frequently being encountered. Obviously, no standard regulating equipment heretofore on the market would meet these exacting requirements.

For many years, manufacturers and engineers have appreciated the great loss of power occasioned by the existing mechanical type of paper machine drives, the enormous amount of space required for the accommodation of the long line shafts, pulleys, belt drives, reduction gear units, friction clutches, etc., and the personal and fire hazard unavoidably associated with this type of transmission. Still more serious is the great loss of production resulting from the frequent paper breakages caused by excessive belt slippage and interruptions of operation for repairs to the various parts of the mechanical system, such as the friction clutches, belts and gear units.

These disadvantages can all be eliminated by the substitution of sectional individual motor drive, with a sufficiently sensitive scheme of controlling the motors, which would at the same time be sufficiently rugged to withstand severe and continuous operation in the hands of unskilled labor; and would be free from the necessity of adjustment or care by skilled electricians.

In response to the increasing demand for sectional motor drive, greatly accentuated by the desire to increase paper machine speeds, which are limited by the mechanical system of drive rather than the characteristics of the machine itself, a perfected type of sectional individual motor drive for paper machines with automatic regulation and control has recently been developed. This new system of sectional paper machine drive involves the development of a type of regulator not heretofore used, whereby the speed of the direct-current driving motors is maintained automatically within one-tenth of one percent; and the use of other standard control equipment for starting and stopping the motors. The regulator equipment itself does not include any delicate instruments or apparatus likely to

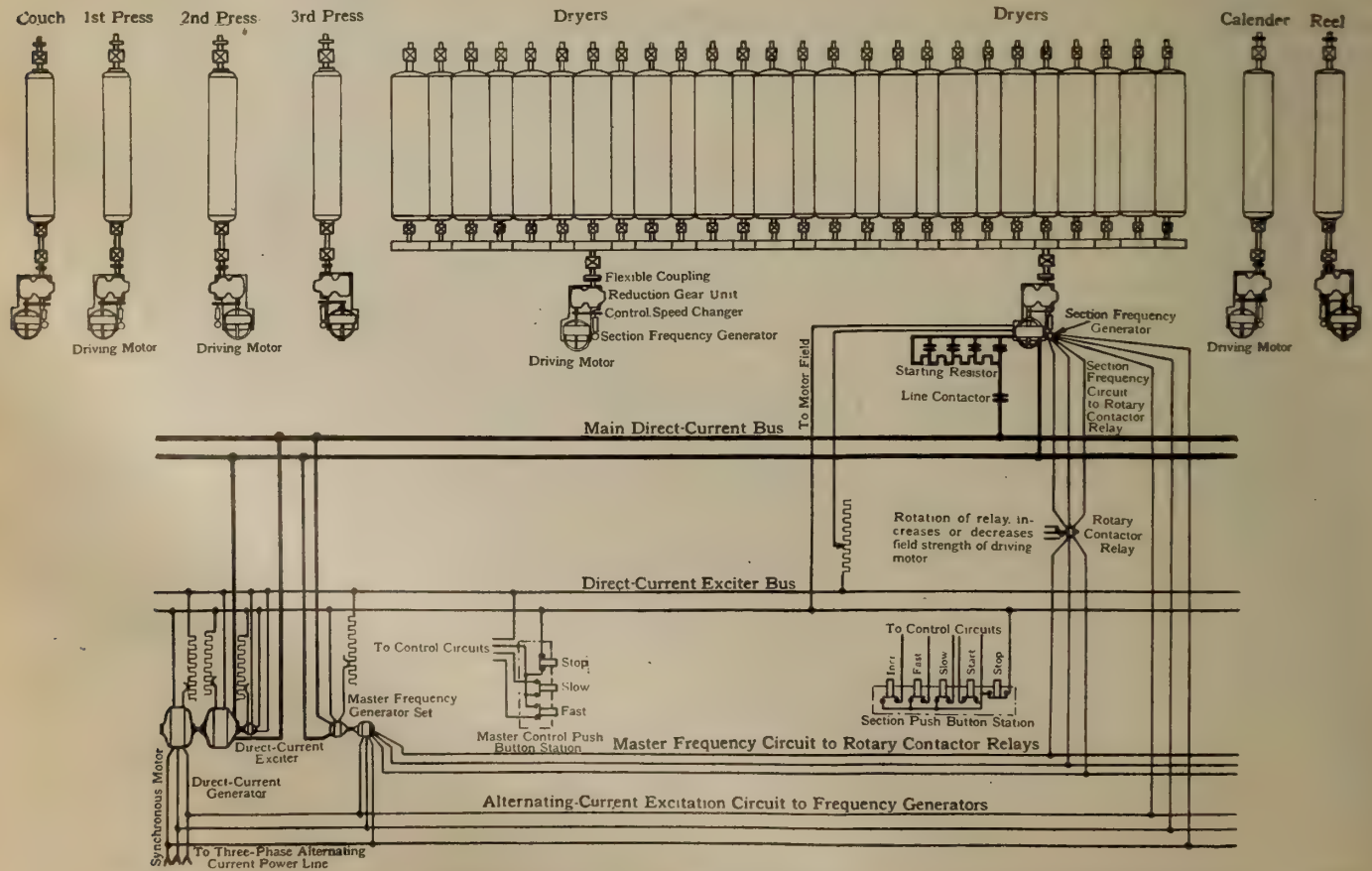


Fig. 1.—Schematic Plan and Wiring Diagram of Westinghouse System of Sectional Individual Motor Drive.

get out of order, such as are usually associated with exceptionally sensitive regulating devices, but is fully as rugged and reliable in every respect as the most approved control apparatus used in industrial applications.

The complete system of sectional paper machine drive and control described in this article consists of an adjustable voltage, direct-current generator, of sufficient capacity to drive the entire paper machine, with direct-connected exciter; a direct-current adjustable speed motor for each section of the machine; suitable means for connecting the motor to each section of the paper machine driving shaft; and a control system which automatically maintains the correct speed of each individual motor; together with push button stations for starting, stopping and adjusting the speed of the paper machine as a whole.

The generator usually forms part of a standard synchronous motor-generator set or turbine-generator unit, and is a 250 volt, adjustable-voltage, separately-excited machine with a constant voltage 250 volt exciter of sufficient capacity to furnish excitation for the synchronous motor field, the generator and motor fields, and for the control circuit of the regulator. The motors, are 250 volt, separately-excited machines, and may be of any desired speed, dependent upon the

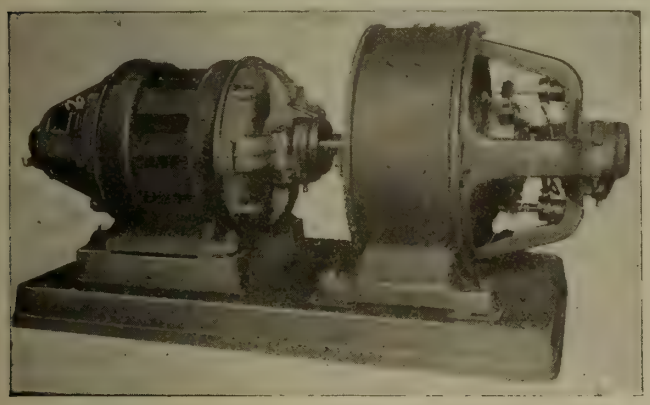


Fig. 2. — Master Frequency Generator Set.

particular requirements of the paper machine involved. Where a comparatively small range of speed for the paper machine is desired, that is, not more than 3:1 or 4:1, this is accomplished by voltage control of the generator through a motor-operated field rheostat. Where very wide ranges of speed, such as 10:1 are required, both generator voltage control and motor field control are used, the same motor-operated face plate controller or rheostat serving to insert resistance in the shunt fields of the several motors uniformly, after the generator has been brought to full voltage.

The automatic control system consists of a small master frequency generator driven by a small direct-current motor operating in parallel with the section driving motors and separately excited; a small frequency generator driven from each of the section driving motors through a small speed changer consisting of two cone pulleys, to one of which the frequency generator is coupled; a powerful synchronous type of rotary relay for each driving motor, which serves to make an electrical contact in one direction or the other on the slightest unbalance of frequencies; and a motor-operated field rheostat, under control of the relay, in the shunt field circuit of each driving motor. The master frequency generator is common to all sections of the paper machine, whereas each section has its own section frequency generator, relay, and motor-operated field rheostat, together with an effective anti-hunting device.

The small frequency generators are all excited by alternating current, but since the master and section frequency generators are excited from the same source, any variations in frequency or voltage of the exciting source have no effect upon the regulation, as they do not disturb the balance of frequencies at the rotary relay. Since no appreciable amount of power is required to operate the rotary relay, these frequency generators are small in size. The small speed changers referred to are of small size, as they do not have to transmit power, but simply overcome bearing friction of the small frequency generator and the friction of their own ball bearings, which is practically negligible. By shifting the small belt on these speeds changers by means of a hand wheel, the relative speeds of the sections, or the draw of the paper, as it is called, is accurately and positively determined by the operator, and is thereafter maintained automatically at the correct value. Any unbalancing of the two frequencies at the rotary relay, caused by change in speed of the driving motor, immediately causes a positive synchronous movement of the relay, making an immediate contact

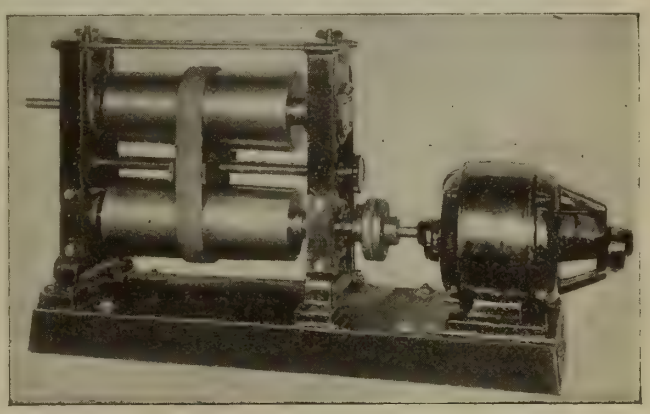


Fig. 3. — Speed Changer and Frequency Generator.

and thereby adjusting the field strength of the motor, and returning the speed to the required value.

Before any governor or regulator can function, there must be a change of some kind, in either load or speed, as otherwise there would be no occasion for the regulator to correct anything. However, these changes in speed need not be large enough to be perceptible to the eye or detectable by ordinary indicating apparatus, to actuate this new regulator. In fact, the regulator will detect changes in speed of a few thousandths of one percent, and make the necessary correction immediately, and without any tendency to overtravel or hunt, so that no perceptible change will be found in the draw of any section.

A control board is provided in connection with each paper machine, having a master control panel for the paper machine as a whole, controlling the generator and master frequency generator; and a unit section control panel for each of the section driving motors. Starting equipment is provided on each of these panels, consisting of motor-operated cam accelerating switches with line contractors under the control of suitable push button stations for starting and stopping the individual motors, and the entire paper machine as a whole.

The master rheostat, under push button control, provides means for adjusting the speed of the paper machine as a unit, over the entire range of speed. The rotary contactor relay and motor-operated field rheostat for each section is also located on the unit section control panel. The push button stations, arranged conveniently on or near the apparatus, provide means for starting, stopping and obtaining any desired speed of the paper machine in the shortest time and in the most efficient possible manner. In this way and in the elimination of the cumbersome mechanical drive, a great deal has been accomplished in increasing production and improving overall efficiency and economy from every standpoint.

While the paper machine has been one of the last places in paper manufacture to derive the benefits of complete electrification, greater benefits will doubtless accrue from this advanced step in motor and control application than from any other phase of electrification in the paper industry.

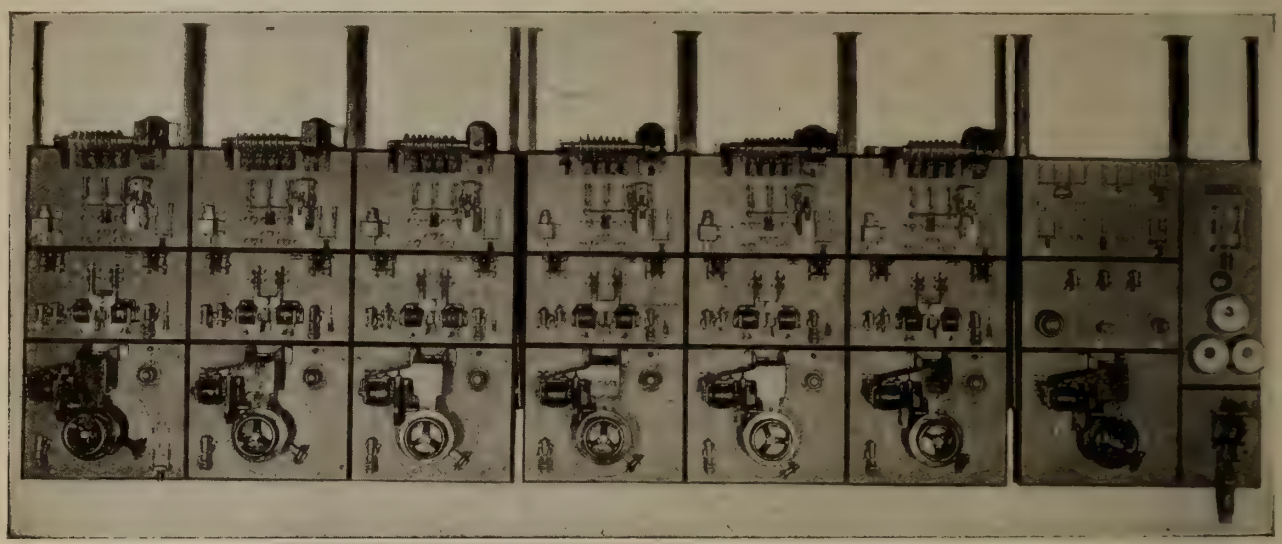


Fig. 4. — Control Board for Sectional Drive 166 Inch Fourdrinier Book Paper Machine.

THE MAKING OF NEWSPRINT PICTORIALLY EXPLAINED.

Some time ago the editor had a letter from Col. Haskell of the International Paper Co., saying that a book was on the way which he thought would prove interesting. The book has arrived and not only has it proved interesting, but it has proved so interesting to others around the office that the editor has hardly had a chance to look it over himself. The use of superlatives in describing a really beautiful object or article sometimes gives the impression of being insincere. We do not wish the following remarks to give such an impression. To say that we were delighted with this attractive indication of the courtesy and friendship of the International Paper Co., is putting it very mildly indeed.

The first thing to remark is the beautiful way in which the book is gotten up. The cover appears to be veneered with wood and the gold and black of the cover design set off most artistically the colored medallion showing a river and forest scene. The book is printed on heavy coated stock and the typography certainly does credit to the printer. The illustrations were drawn especially for this work and being reproduced in several colors most effectively set off the scenes incident to the harvesting of the wood and the colored sections photographs, and sketches of the machinery make much clearer the function of the different parts and the course of the materials.

We find that a brief history of paper making from the time of the Chinese down to the introduction of woodpulp in the mill of Warren Curtis and the formation of the International Paper Company. Next is a review of the woodlands controlled or owned by the Company and a map showing the location of the company's mills.

The listed water power developed and available aggregates 272,220, which is 25 per cent greater than power development of the Burton Law. It is interesting to note that the company requires 500,000 tons of coal in addition to the power developed in its hydro-electric plants.

The story of newsprint begins with the harvesting of pulp wood and here we see the typical logging operations under way. Then comes the preparation of the wood with pictures again showing each step and explained by a note which clearly conveys the meaning. The process of making mechanical pulp is told almost entirely by pictures which are almost as good as a trip through a mill. The artist has even succeeded in giving the impression of motion in the treatment of the photograph of the chipper. Diagrams show the meaning of each step in the manufacture of chemical pulp and a four page diagram shows the newsprint machine with the paper passing over it. Similar pictures then take up the important individual sections of the machine so that the function of each can be more clearly illustrated and explained. At the end is a short description of the organization with pictures of the officials. Having thus briefly described what is one of the finest examples of this kind of work we have seen, we wish to congratulate the company on the manner in which this subject has been treated.

The Technical Section expects the pleasure of seeing Mr. George E. Williamson, President of the Technical Association of the Pulp and Paper Industry; Mr. R. S. Kellogg, secretary of the Newsprint Service Bureau and other noted Americans on the trip up the St. Maurice Valley (and back).

Newsprint Production 11 p.c. less

The figures which follow show the results of the Federal Trade Commission's tabulations for April:

	Stock on hand 1st of month	Production	Stock on hand end of month
Total Newsprint :	Net tons	Net tons	Net tons
April, 1921	47,789	115,408	35,106
Total (4 mos.) 1921 ..	24,763	449,810	35,106
Standard News :			
April, 1921	35,517	105,855	29,580
Total (4 mos.) 1921 ..	19,573	412,632	29,580

Note:—Above figures for total newsprint do not include hanging paper.

The average production of total newsprint and standard news based upon the total combined production for the years 1918, 1919, and 1920, amounted to 117,442 tons of total newsprint and 105,716 tons of standard news, for a period corresponding to April. The actual production amounted to 115,408 tons of total newsprint and 105,855 tons of standard news, which for total newsprint was 2 per cent below the average for the three-year period and for standard news about the average.

The production of newsprint for April, 1921, compared with April, 1920, shows a decrease, amounting to 10 per cent for total newsprint and about 11 per cent for standard news.

The production for April, 1921, compared with April, 1919, shows a decrease of 1 per cent for total newsprint and a decrease of 1 per cent for standard news.

The increase of production for April, 1921, over April, 1918, amounted to 4 per cent for total newsprint and 4 per cent for standard news.

Mill stocks of both total newsprint and standard news decreased during April, 1921.

Loss of Production.

The following tabulation shows idle machine time reported to the Commission for the month of April, 1921:

Reasons	Number of machines	Hours idle
Lack of orders	16	4,218
Repairs	12	1,991
Other reasons	9	1,348*

* Includes 576 hours due to strike.

Imports and Exports.

The imports and exports of printing paper not dutiable (practicaly all newsprint) and of woodpulp for the month of March, 1921, compared with the month of March, 1920, were as follows:

	March 1921	March 1920
Imports of Newsprint (total)	66,790	55,132
From Canada	50,801	52,683
From Germany	3,740	.....
From Sweden	5,600	1,879
From Finland	5,358	.....
From Norway	1,229	570
From other countries	62	0
Imports of Ground Wood Pulp (tot.)	2,684	9,642
Imports of Chemical Wood Pulp (tot.)	21,225	53,870
Unbleached Sulphite	9,555	27,934
Bleached Sulphite	6,259	7,762
Unbleached Sulphate	5,384	16,804
Bleached Sulphate	27	1,370
Exports of Domestic Wood Pulp ..	2,496	3,868

The imports of newsprint for March, 1921, were 11,658 tons more than for March, 1920. The exports for March, 1921, were 2,581 tons less than for March, 1920.

The tonnage to "other countries" under "exports of Newsprint" for March, 1921, includes 30 tons to Canada, 30 tons to China and 21 tons to Columbia.

The imports of ground wood pulp for March, 1921, were 6,958 tons less than for March, 1920. The exports of domestic wood pulp were 1,372 tons less than for March, 1920.

Publishers and Jobbers' Tonnage.

Stocks of rolls in the hands of jobbers at the end of April were 424 tons more than the stocks in the hands of the same jobbers at the beginning of the month. Stocks of sheets were 711 tons less at the end of April than at the beginning of the month. The net decrease in the total stocks of newsprint in the hands of jobbers at the end of April amounted to 287 tons.

Commitments to sell roll news were 4,628 tons greater than commitments to buy. Commitments to sell sheet news were 885 tons less than commitments to buy. Total commitments to sell both rolls and sheets were 3,743 tons greater than commitments to buy.

Publishers' stocks increased 2,193 tons during the month. The average daily tonnage used during April was 366 tons more than the average used in March.

Eighty-two publishing concerns held about 76 per cent of the tonnage on hand at the end of the month.

Publishers' stocks and transit tonnage on April 30th represented slightly more than 53 days' supply at the existing rate of consumption.

The domestic consumption of standard news, by metropolitan dailies using between one-half and three-fourths of a million tons annually, for April, 1921, when compared with April, 1920, shows that the consumption for the month of April, 1921, was practically the same as for April, 1920, and increased slightly more than 11 per cent for April, 1921, over April, 1919.

Average Prices Paid by Publishers.

The weighted average price of contract deliveries from domestic mills to publishers during April, 1921, f.o.b. mills in carload lots for standard news in rolls was $5.409 per 100 pounds. This weighted average is based upon April deliveries of about 50,000 tons on contracts involving a total tonnage of approximately 650,000 tons of undelivered paper manufactured in the United States.

The weighted average contract prices based on deliveries from Canadian mills of about 30,600 tons of standard roll news in carload lots, f.o.b. mill in April, 1921, was $5.607 per 100 pounds. This weighted average is based upon the April deliveries on contract involving about 300,000 tons of undelivered Canadian paper.

The weighted average market price for April of standard roll news in carload lots f.o.b. mills based upon domestic purchases totaling about 2,500 tons was $5.206 per 100 pounds.

Forest fires benefit no one and they rob the workingman, the merchant, the farmer, and indirectly every citizen. Forest fires are fought not only in the bush, but in towns and cities. When Canadians of town and farm and forest are all determined to stop forest fires, then our forests will be freed from the ravages of this fiend.

Brompton's Diversified Output is Unique in Canada

By A. R. R. JONES.

The Brompton Pulp and Paper Company, Ltd., was incorporated by Dominion charter in 1916. It acquired the entire undertaking, properties and assets of the Brompton Pulp and Paper Company, incorporated by a special Act of the Quebec Legislature in 1912, and which, as a close corporation, was successfully carrying on the profitable business established several years previously.

The inception of the Brompton business took place in 1898 when Mr. E. W. Tobin, who lived at Bromptonville and was selling wood to the Odell Manufacturing Company, of Groveton, New Hampshire, asked his friends to build at Bromptonville and use the power there. This was the start of the Brompton business, with Mr. C. C. Wilson buying the timber. By 1901 the plant was completed, and pulp began to be made at Bromptonville.

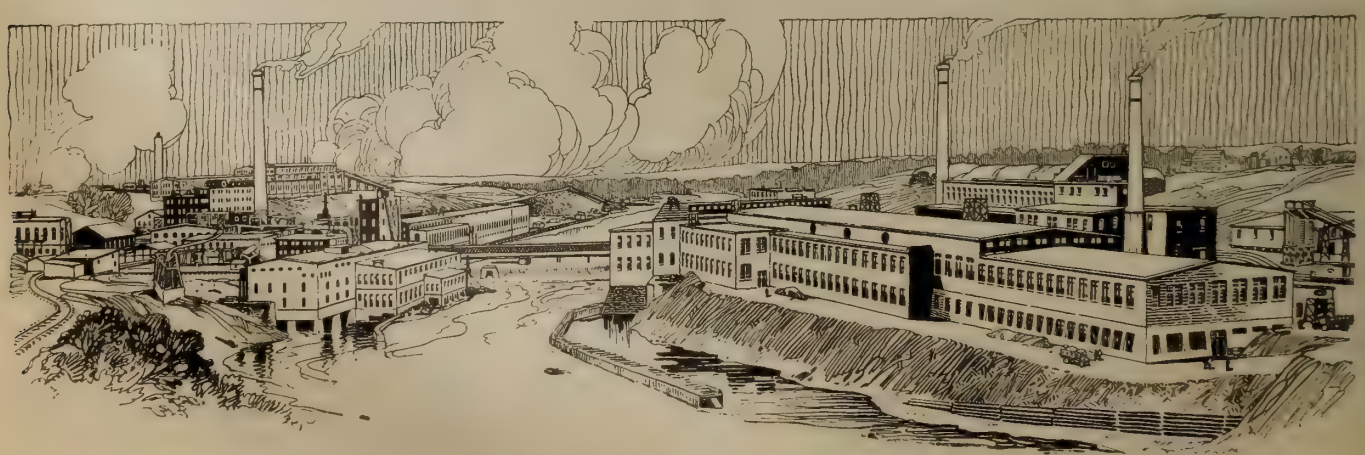
In 1907, the Royal Paper Mills at East Angus, failed and were taken over by the Eastern Townships Bank. On the 1st of May in that year, the total holdings of the Royal Paper Company were bought, or absorbed by the Brompton Paper Company, and in the fall of 1907 the first sulphite pulp, from which kraft paper is made, was produced at East Angus by the Brompton Pulp and Paper Company.

This company continued without much expansion until the 1st January, 1910, when Mr. J. A. Bothwell, the present general manager, bought an interest in the company. At that time the plants operated by the company were a groundwood plant at Bromptonville, the sulphate plant, with a capacity of 20 tons a day, and two paper machines, with a total capacity of 25 tons a day at East Angus. On the 4th May, 1910, the company started to expand by building a new groundwood mill, three quarters of a mile above East Angus. In 1911, the sulphate mill was rebuilt, and enlarged to a capacity of 90 tons a day. In the same year, a second groundwood mill was also built across the river, as well as a new wood room. In the following year, a box board machine was added, with a capacity of 30 tons a day, and, in 1913, the old wooden mill and beater room were pulled down and rebuilt of brick. In 1914 a news mill was built, and one machine, turning out 55 tons a day, installed. Two years later the present company was incorporated and acquired, as was said above, the entire undertaking, properties and assets of the former Brompton Pulp and Paper Company.

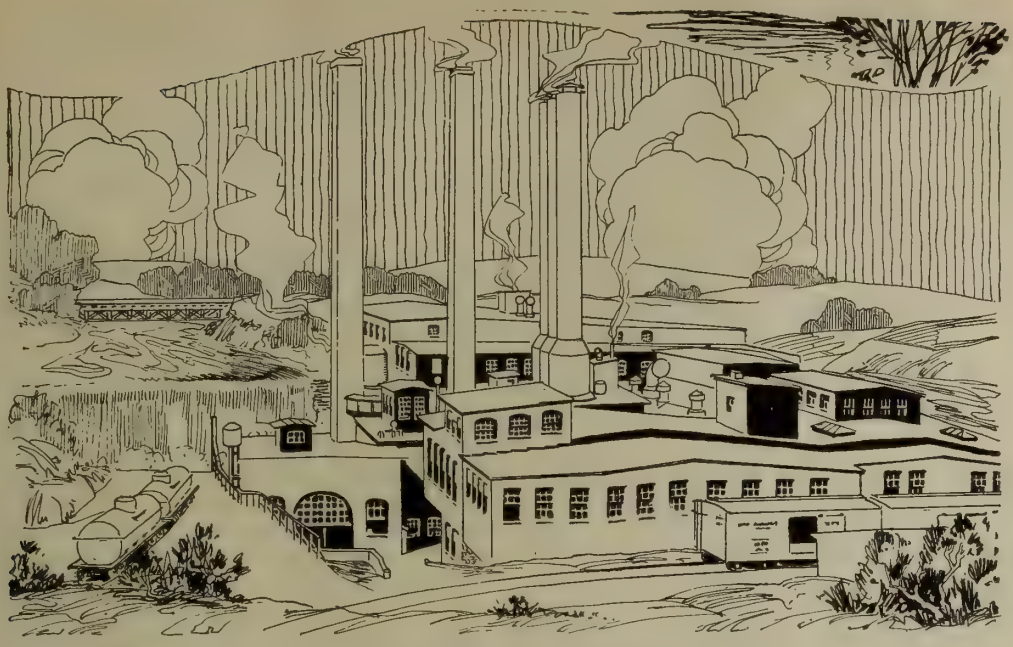
Since that date the record of the company has been one long story of improvements, extensions and expansions in all directions. The consistent policy of those who guide its fortunes has been to increase its coming power by the investment in plant of surplus earnings, over and above reasonable dividend payments. Today the company's mill properties consist of (1) At Bromptonville, Que., about six miles from Sherbrooke, a large groundwood pulp mill, (2) At East Angus, Que., about fifteen miles from Sherbrooke, groundwood pulp mill, kraft pulp and newsprint paper mills, box board mills and a kraft paper mill. (3) Two saw-mills, one at Bromptonville, and one at East Angus. (4) At Groveton, New Hampshire, sulphate pulp and board and kraft paper mills. (5) At Claremont, New Hampshire, kraft paper mills. All the plants are conveniently situated, with adequate water and railroad facilities and well adapted for economical manufacturing and shipment.

Geographically, the mills of the subsidiary companies are so situated as to result in economy of operation and marketing. With regard to these companies it should be mentioned that the Claremont concern, which was purchased on the 1st January, 1918, was the first to make kraft paper in the United States, and by reason of its ownership of the Claremont mill property, the company is able to expand its business by shipping pulp from East Angus for the manufacture of kraft at Claremont for the New England market. Indeed, the Claremont property has proved a remarkably profitable and satisfactory asset. The same thing can be said of the mill property at Groveton, which was purchased from the Odell Manufacturing Company on the 1st January, 1919. Both the Claremont and the Groveton plants have been brought strictly up to date. By their acquisition the company has been made into a self-sufficient unit, with the market in its own hands for the greater part of its unfinished product.

In respect of the imported matter of timber limits, the company is in the fortunate position of owning in fee simple 280 square miles of Freehold Timber Lands and controls by lease from the Quebec Government 810 square miles of Crown Lands. The Groveton Company owns in the State of New Hampshire 65,000 acres of



Part of East Angus Mills, Quebec.



Claremont Mills, New Hampshire.

timber limits, pulp wood from which is accessible at low cost to the Groveton Mills. The limits are estimated to contain 7,000,000 cords of Pulpwood and a very large quantity saw logs and hardwoods, which are valuable in the manufacture of chemicals. The Standard Chemical Company, with plant at Weedon, near the company's holdings, is a large purchaser of hardwoods. The company controls practically all timber tributary to the St. Francis River above its mills. Wood from individual holdings is available for purchase on favorable terms. Without making allowance for wood purchased from sellers, it is estimated that wood reserves on the company's limits are sufficient for all future operations at present capacity.

As regards the company's water powers, these comprise two developments on the St. Francis River, at East Angus, having a combined maximum of 10,500 h.p., and a development at Bromptonville of 10,000 h.p. maximum, and developments at Claremont, N.H., and Bellows Falls, Vt., and Groveton, N.H., of 1,650 h.p. Two undeveloped water powers of an estimated capacity of 6,000 h.p. each are owned by the company, and are capable of reasonably cheap development. Storage dams have been installed by the Quebec Government for the purpose of stabilizing that amount of power.

The company manufactures groundwood, kraft and fibre papers, newsprint paper, box board and lumber, and it enjoys the distinction of having a more diversified output than any other large Canadian company. This varied output ensures both constant supplies of raw materials and also steadiness of earnings from the sale of finished products. The annual production, in tons, of the respective plants is as follows:



Groveton Mills, New Hampshire.

	Ground-wood.	Sulphate.	Sulphite.	Newsprint.	Bond & Kraft.	Boxboard.	Gross Total.
Bromptonville	32,000	.....	.....	.....	.....	.....	32,000
East Angus	40,000	27,000	.....	34,000	9,000	15,000	125,000
Groveton	.....	.....	25,000	.....	24,000	.....	49,000
Claremont	.....	.....	.....	.....	21,000	.....	21,000
Total Gross Output	72,000	27,000	25,000	34,000	54,000	15,000	227,000

The net tonnage for sale from this gross, after eliminating inter-company sales, is 123,000 tons.

The chief officers of the company, which employs in all some 3,000 workers, are as follows: Mr. F. N. McCrea, M.P., president; Mr. H. W. Beauclerk, vice-president; Mr. J. A. Bothwell, general manager; and Mr. W. N. Munroe, treasurer.

RUBBER AND THE PULP AND PAPER INDUSTRY.

By J. M. S. CARROLL, Sales Manager, Dominion Rubber System.

It can be truthfully said that without the successful co-operation of the Rubber Technologist, the Pulp and Paper industry would not have developed so rapidly as has been the case in recent years.

Owing to the extremely moist character of the interior of a pulp or paper mill, practical experience has determined that rubber is the ideal physical material used in conjunction with other suitable elements, for use in connection with many essential mill operations.

Rubber Covered Rolls have made possible the speeding up of newsprint machines to a point where daily production per machine has increased enormously. Some recent machines installed in Eastern Canadian mills are expected to ultimately reach the hitherto unheard of speed of 1000 feet per minute. In supplying the demand for thoroughly dependable rubber covered rolls for use in paper manufacture accurate densities relating to various types of rolls are assured by infallible mechanical methods.

Rubber belting has practically displaced all kinds of material previously used in pulp and paper mills relating to the transmission of power. Experience has demonstrated, definitely and finally to most mils, that good Rubber Belting is the ideal and most economical element to use on all power drives. It cannot be surpassed for dependable and satisfactory work under all conditions met with in pulp and paper mill operations.

Rubber Conveying Belts are an important factor in conveying chips, pulp, etc., and economical and dependable operation is invariably assured with their use if they are of high quality.

Deckle Straps require special accuracy and balance to operate successfully. Screen Diaphragms, Hose for mill operation and fire protective service, Packings, Valves, Rubber Boots, etc., are other rubber products regularly used in pulp and paper mills.

FIRE PREVENTION HINTS FOR SMOKERS.

Don't drop FIRE when you smoke in the woods, nor throw it out along the road. Keep the forests!

Matches, pipe coals, cigar stubs, and cigarette ends start many forest fires.

BE CAREFUL! Don't start a fire in the woods when you begin or end your smoke! Be sure your match, cigarette or pipe is out.

YOUR CO-OPERATION in order to keep down forest fires is asked. Break your match in two. Knock out your pipe ashes into your hand. Don't drop a burning cigarette.

FOREST FIRES cost millions a year; don't start one.

GENERAL DECLINE IN COMMODITIES ENDED.

Recent increases in the wholesale prices of certain commodities do not indicate a new period of rising values, in the opinion of Herbert P. Howell, Vice President of the National Bank of Commerce in New York. They do, however, show that the violent general decline in raw materials is definitely at an end. Many individual commodities will show considerable further revisions, he believes, but the general movement has reached a level at which manufacturers may do business on the basis of their own requirements irrespective of the market prices of unrelated commodities.

"Of the twenty-six representative commodities quoted monthly by the National Bank of Commerce in New York in its magazine, Commerce Monthly," Mr. Howell points out, "sixteen showed increases in May over the preceding month while four stood still and only six continued to decline.

"These increases must not be construed as indicating a new period of rising prices. Some of them are seasonal in character and others reflect a tendency toward stabilization on the part of commodities which in the general decline that began in the spring of 1920 may have fallen below a fair valuation. The increases are important, however, because they demonstrate that the process of liquidation has reached a point where raw materials are beginning to react to conditions in their own individual markets.

"Normally the price movement of every commodity is determined primarily by the status of its own market and that of commodities immediately related to it. Only in boom periods or during violent depressions are prices affected more by the general movement than by these individual factors. What has happened now is a return toward normal conditions. Henceforth, commodities may be expected to fluctuate in obedience to the influences of specific supply and demand.

"Many prices have stabilized. This does not mean that there will not be further declines. They may be expected in many lines, and commodities which have not yet been adjusted will receive no support from others that have reached a stable footing. In their decline, they will not force down commodities in which deflation has already occurred.

"While the violent general decline in raw materials and related products is over, this does not preclude a slow decline for a period of years. Such a decline would be no menace to sound business. It is perfectly possible in such a period to carry on sound manufacturing and merchandising operations with profit. Gradually falling prices over a period of years would not materially affect the price movement of commodities over such periods as are usually necessary for these operations. The present generation of American business men has been unduly alarmed by the downward tendencies of prices. Rising prices are not necessary to prosperity and a slow downward movement is discouraging only to reckless speculative activities."

Serious Situation in British Paper Industry

(From Our London Correspondent.)

London, May 17, 1920.—The situation in England at present is growing more serious every day. Everybody appears to be in a fighting or argumentative mood and combinations are setting themselves up against combinations with a view to achieving their own objects. On one side we have capital versus labour, and on the other the consumer, and importer versus the manufacturing interests—with daily and trade Press soothing syrup thrown in to relieve (or kill) heated views on the many sided heated subjects. As time goes on things seem to become worse. The British trade industry and the pulp trade have received a rude shock in many ways and the Imperial Government is still holding the Army Reservists and a special volunteer force to cope with the miners—or any others—if they "want trouble." People living in the United Kingdom today are in a most inglorious, discontented age, and it can only be put down to the Great War's reaction and the variations in the cost of living since 1914.

People today say: "You are optimistic"; "You are pessimistic";or "You're attitude is one of nonchalance to the industrial position." These are some of the traits in one's character and behind all the different elements at work fighting against industrial unrest and working out the ravages of decadent exchanges looms the manufacturer—bravely combatting for a simple existence in a free country where he can give employment and help make himself a valuable asset. We must face facts—and it is to be hoped Canadian manufacturers will never experience what their British confreres are going through just at the moment. A short survey of present conditions will suffice.

Newsprint Consumers Combine.

Readers of the British Trade news in the "Pulp and Paper Magazine" must first of all recall past writings on the variations in the rates of exchange in Europe and elsewhere, and on the movement to encourage trade within the Empire. Therefore, Canada does not come within the category of foreign imports into the United Kingdom and the Dominion's position in England today is something similar to that of the British manufacturer, viz., competing against cheap imported goods owing to unfair rates of exchange and sweated labor. The present position in the British market is attributable to the reaction of the Great War, and very naturally mill owners, who employ thousands of workers,—and who pay heavy taxation to the Imperial Exchequer—began to consider their position in relation to importers of paper and foreign exporters in a market where British manufactures were being sold. It was found there was underselling, due to rates of exchange. The Anti-Dumping Bill was then introduced in Parliament to save several industries, and knowing their industry was in grave danger some paper manufacturers appealed for a clause in the Bill to save paper. Newsprint consumers protested because they could buy the foreign product at a much lower rate than the British—although the British mills were selling several points below cost price. Unfortunately the discussions that followed in the newspapers and in the trade journals were tainted with old prejudices. The appeal to be included in the Anti-Dumping Bill drew forth the arguments of the "Free Trader" and in reply to him the "Protectionists" exploited their views. Personalities followed, one section of the Press backed up the "Free Traders," another wobbled on the fence, and another stood out for the "Protectionists." The "fight" is still in progress. The Anti-Dumping Bill has been partly considered by the House of Commons, and the consumers of newsprint have banded themselves together to prevent the British paper maker getting any protection by the Parliamentary measure which aims at putting 33 1-3 p.c. duty on all paper imported from foreign sources where there is a debased exchange in existence. But paper is not yet in the Parliamentary Bill and never was. It was only suggested that it should be included and the suggestion has developed into a clashing of interests. But the fight is in progress to get it included, with the consumers objecting to the inclusion. A great majority of these consumers are depending on foreign supplies. They never think of such places as Canada; they simply think of Scandinavia and surrounding places, and the Scandinavians are now telling them to get busy with their spokesmen in Parliament and save the consumer. How would Canadians like to produce newsprint and sell it in New York for less than 5 cents a lb.? Foreigners are producing it in Europe and selling it at this rate, with 2½ p.c. for prompt payment, in England. No British mill could pay wages and taxation and sell at such a price. And it is against foreign competitors of this kind that the Canadian manufacturer is expected to compete in the British market.

Decline in Paper Exports and Imports.

The decline in the exports of British paper is another serious element telling against the British mill. The miner's strike is responsible in part and dull markets abroad in part. So serious has the situation developed that many mills are closed down, whilst others are on short time owing to the small supplies of coal allowed by the authorities. The result is that unemployment is on a large scale and the British mill owner is being beaten every day in his own market by the cheap foreign paper.

During April last, paper, wrappings, paper bags, cardboard, etc., etc., were exported to the extent of 111,828 cwts., compared with 64,440 cwts. for the corresponding month in 1920. From January to April the exports were 573,716 cwts., as against 601,893 cwts. in the period of 1920—a decline of 32 per cent being shown in April last.

The principal exports chronicled are printing papers (not coated) and writing papers, and the countries to which they are shipped are as follows:

Export of printings (four months): To France, 4,590 cwts.; U.S.A., 2,590 cwts.; other foreign countries, 52,840 cwts.; South Africa, 35,403 cwts.; India, 42,638 cwts.; Straits Settlements, 5,861 cwts; Ceylon, 5,660 cwts.; Australia, 120,205 cwts; New Zealand, 21,769 cwts.; Canada, 1,369 cwts.; other British Possessions, 15,799 cwts. These make a total of 308,724 cwts. (219,189 cwts. in 1920). Comparing April last with March last the figures respectively are 60,660 cwts. (f.o.b. per cwt. value £3 14s. 10d.) and 50,920 cwts. f.o.b. per cwt. value £4 6s. 8d.)

Exports of writings (four months): To France, 591 cwts.; U.S.A., 232 cwts.; other Foreign countries, 10,-

560 cwts.; South Africa, 4,205 cwts.; India, 10,211 cwts.; Straits Settlements, 1,490 cwts.; Ceylon, 1,001 cwts.; Australia, 15,158 cwts.; New Zealand, 7,616 cwts.; Canada, 289 cwts.; other British Possessions, 3,996 cwts. These make a total of 55,349 cwts for the four months compared with 59,425 cwts in 1920.

In the reports of packing and wrapping papers, paper hangings, roofing paper, envelopes, and "other manufacturers" there were sharp declines of noticeable features.

Turning to the imports they reached 1,676,559 cwts. in the period January-April, compared with 3,611,848 cwts. for the corresponding months in 1920. The imports cover all paper and boards.

The imports of printing paper were (four months): From Sweden, 164,887 cwts.; Norway, 66,630 cwts.; Germany, 30,699 cwts.; Belgium, 27,152 cwts.; U.S.A., 3,458 cwts.; Canada, 5,193 cwts.; Newfoundland, nil; other countries, 272,990 cwts. The 30,699 cwts. received from Germany were valued at £78,944 and the 5,193 cwts. from Canada at £16,622. I quote these figures for comparison in prices.

Packing, wrapping and tissue papers were imported as follows (four months): From Finland, 45,092 cwts.; Sweden, 96,096 cwts.; Norway, 53,545 cwts.; Germany, 69,865 cwts.; Belgium, 24,429 cwts.; Canada, 7,359 cwts.;cwts.; other countries, 39,262 cwts. A total of 335,585 cwts., as against 1,510,508 in the period January-April, 1920. It will be noticed that Canadian supplies show a big falling off, which is to be regretted.

Coated papers (four months) imports: From Germany, 5,497 cwts.; Belgium, 4,324 cwts.; France, 1,406 cwts.; U.S.A., 3,510 cwts.; other countries, 2,199 cwts. Coated paper imports show a material decline. The total supplies being only 16,933 cwts., as against 33,417 in 1920.

Oil Fuel.

These imports and exports do not make cheerful reading. One has only to look at the imports and consider the British mill owner. He is fighting them furiously, he is fightng high taxation in his own country and now he is up against the coal miner who is throttling the paper industry among others. Therefore, the British paper maker must be always on the look-out for something new and efficient to bring about economy in the mill. True, he has been slow in adopting electricity for driving power, but there are arguments for and against his action. Out of 500 mills only about 21 mills are driving machinery with electricity and the great majority of the remainder are not in a position to introduce it owing to the exigencies of the mill. But attention has now been given to oil fuel, in place of coal, and experiments are being made with it with a view to abolishing the worry and annoyance—and expence—attached to coal as a fuel. As things stand at the present the coal miner has simply paralyzed the industry of paper. The railroad men are aiding in that paralysis, and if something is not soon settled about the coal mines I am afraid there will be a "bust" up all round over the importing of foreign coal into the country. Consequently oil fuel is now the papermakers' salvation, and he is testing it in order to help him keep his head above water in these troublesome times.

Big Decline in Pulp Imports.

Foreign importers of pulp to the British market remind the paper industry that if a 33 1-3 per cent *ad valorem* duty is placed on imported paper prices of pulps may become more buoyant. The hint is an indirect one. If the Canadian resources had been studied more keenly in the United Kingdom and financed in the past with more freedom by British interests, there would not be any hints thrown out today by foreign interests as to what they would do in the way of retaliation. As things are at present the British mills get large supplies from Finland and Scandinavia and are dependent on them for chemical pulps.

Owing to the dullness of the paper trade and industrial unrest there is no market worth writing about for pulps. There is a great depression all round, but prices remain unchanged. So far as can be ascertained a ground wood (wet) can be bought from £8 to £8 5s. a ton (f.o.b., c.i.f., etc.) Bleached sulphite is £39 10s.—£40 a ton, and easy bleaching, £29 and £30. Newsprint sulphite is in the region of £25 a ton, and unbleached soda (No. 1) £29 10s., with kraft £1 extra.

The imports of woodpulp for April were only 22,886 tons, compared with 71,528 tons in April, 1920. The imports of groundwood (wet and dry) in April were 15,567 tons, against 20,574 tons in March, 23,399 tons in February and 28,850 tons in January. Chemical pulps were imported to the extent of 7,319 tons in April, 5,420 tons in March, 9,210 tons in February, and 18,350 tons in January.

Four months—January-April—supplies were as follows: Groundwood (wet), 87,170 tons (116,696 tons in 1920); Groundwood (dry), 1,084 tons, (12,201 tons in 1920); Bleached chemical (dry), 4,798 tons (11,253 tons in 1920); unbleached (dry), 34,607 tons (137,304 tons in 1920); chemical (wet), 889 tons (1,487 tons in 1920).

Groundwood was imported from the following places during the months January to April: From Sweden, 444 tons (9 tons in 1920); Norway, 79.212 tons (109,073 tons); Canada, 7,520 tons (490 tons); other countries, nil, (620 tons). Total 87,170 tons (116,696 tons in 1920).

Bleached chemical, dry, (four months): From Finland 1 ton (nil, in 1920); Sweden, 99 tons, (1,936 tons); Norway, 4,152 tons, (6,837 tons); Germany, 140 tons, (425 tons); Canada and other countries, 406 tons, (2,057 tons)—total 4,798 tons (11,255 tons in 1920).

Unbleached chemical, dry, (four months): From Finland, 2.008 (11,516 tons in 1920); Sweden, 20,226 tons (79,731 tons); Norway, 10,644 tons, (35,399 tons); Germany, 990 tons (456 tons); Canada and other places, 739 tons (10,202 tons). Total, 34,607 tons (137,304 tons in 1920).

The Irish Paper Mills.

The unsatisfactory conditions prevailing at present in Ireland compelled the Irish paper manufacturers to hold a conference in Dublin. Like Canada there is a strong movement to favor Irish goods and the paper makers thought they should enjoy a share of the trade. Unfortunately some of the newsprint mills are not running at present for want of orders and the Irish paper makers did not hesitate to point out that while their newsprint mills were closed down, thus causing unemployment, the Republican, Nationalist and Unionist newspaper proprietors had large stocks of imported paper on hand. Within recent years there has been a remarkable development in the Irish paper mills. In some cases new machinery has been installed, particularly for cardboard making, and it is regrettable that the present depression has stultified the millowners' objects.

UNITED STATES NOTES

The United States Forestry Bureau in Alaska is receiving bids for tracts in a sale of a timber area which is second only in extent to that figuring in the Admiralty Island sale several years ago. The tracts advertised for sale are located on the east shore of the Behn canal, on Revillajigedo island between Traitor cover and Neets bay divide and Curlew point, about 32 miles north of Ketchikan. They cover 45,380 acres and the estimated total stand is 100,000,000 cubic feet. About 20 per cent of the timber is Sitka spruce, 66 per cent, hemlock and 14 per cent. western red cedar. Two years are allowed for beginning operations, after which 30 years are allowed in the contract for the removal of the timber. The purchaser must construct pulp mills at 25 ton capacity by October, 1924, and increase these to 50 tons capacity by October, 1926. A bond of $20,000 is required. Bids will be received until July 7.

Damage estimated at $25,000 was sustained in a fire which, according to recent reports, partly destroyed the plant of Buffalo Wastepaper Company, Wabash street, Buffalo, N.Y.

Reports that employees of the American Writing Paper Company might have to forego pay for their vacation periods this year have been emphatically denied by the company's officials.

Robert F. Keogh, H. B. Rike, J. H. Eckman, George Shingledecker and Clarence Williams, all experienced paper men, are named as incorporators of the Buyers' Paper Company, capital $35,000, in papers filed at Dayton, Ohio. The new firm has leased quarters in Dayton where it intends to operate, handling all brands of paper and twine.

The Senate resolution recommending the appointment of a commission to take up the pulpwood situation with Canada has not yet been reported out of committee. Senator O. W. Underwood, of Alabama, who introduced the resolution, does not expect a favorable report, but he declares that he intends to push for action on it at the present Congressional session.

The National Drug Label and Box Manufacturers Association have appointed a committee to collect data relative to imports of paper boxes of the smaller variety and the dumping of these articles in the United States to the detriment of the American made product. It is said that with the imitative skill and low labor costs, the Japanese find that it is not difficult to compete with this class of box trade in the United States. A brief summary of the situation has been filed with the Ways and Means Committee of the House of Representatives at Washington, and a full report of manufacturers' committee findings will be submitted with a view to consideration in tariff legislation now pending.

George W. Hoffner, one time amateur golf champion of Philadelphia, easily defeated Philip W. Simons of Springfield, Mass., a former Harvard star, in the final for the championship of the Paper Trade Golf Association at Philadelphia last Tursday.

Waste paper gathered in the big office buildings in New York City was at a premium a few months back and good prices were in order because of the competition of the mills to get it. This competition, according to a report by the trade waste and ash committee of the New York Building Managers and Owners' Association, has ceased and the waste paper market is completely demoralized, due to the fact that the mills are no longer calling for it. The building managers are thus facing the problem of higher cost for the removal of their waste paper, and unless relief comes through general business improvement, they may have to pay for the disposal of this material.

Forest fires which raged for the greater part of last week in Franklin and St. Lawrence Counties, New York, wreaking great damage and costing the lives of two persons, were checked Friday when rain came to the assistance of the hundreds of fire fighters who have been striving desperately to keep the blazes from spreading. The hamlet of Meno, near St. Regis Falls, was completely destroyed. The two deaths occured there and were due to the quick spread of flames driven before a high wind. Included in the sweep of the fire in the heart of some of the richest timber country in the North Adirondacks, was a 100-foot railroad trestle spanning the Madawaska River. One of the largest of the fires raged at Cranberry Lake, where a tract of 150 acres has been burned over. At St. Regis Falls, while the fire was blazing most fiercely, the heat was so intense that a log jam in the St. Regis River burned to the water's edge.

Fires have also been raging in the Wales branch of the Minnesota State forest reserve. The blaze, at last accounts, was not under control and it was reported spreading over the boundary into the national reserve. Camps Nos. 8 and 10 of the St. Croix Lumber Company have been burned.

Settlement of the strike of workers in many of the paper plants in the United States may be brought about this week by submission of the questions of wages and working conditions to arbitration. Jeremiah T. Carey, president of the International Brotherhood of Paper Makers is quoted as saying that a group of manufacturers had made a proposal to arbitrate the disputes which brought about the strike, and added that a conference is being arranged. The International Paper Company is not included in the group of manufacturers which is desirous of arbitration.

HOW FAST DO TREES GROW?

One of the things most necessary to know in regard to Canadian forests is how rapidly they grow again, when cut down or burned over. Most of the European countries have this knowledge in fairly complete form and are managing their forests accordingly, but European figures cannot be applied to Canadian forests. Each country must make up its own growth-tables. Information on this subject is being gathered in different parts of Canada. One of these scientific studies of the rate of tree-growth is being made by the Forestry Branch of the Department of the Interior at Petawawa, Ontario, in the heart of the Ottawa valley. Plots of different kinds of trees are set apart, and the rate of growth in these measured and recorded. The effect of thinning, trimming, and draining upon the growth is also studied, so that in a comparatively few years data will be available which will be of the greatest value in the management of Canadian forests and woodlands.

Technical Section

REVIEW OF RECENT LITERATURE.

A-3. Pulp or Fibrous Material for the Manufacture of Paper, Papier-mâché, etc. Br. patent No. 137,105, L. H. SKINNER, London, Dec. 30, 1918. **J. Soc. Chem. Ind.,** xxxix, 227A (March 31, 1920). Fibers of a silky nature are obtainable from the tree mallow plant or from the tree mallow grafted or budded on to the stalk of a Jerusalem artichoke or sunflower. The stems are collected in the late fall, preferably after frost; they are chopped, boiled with water for eight hours, and reduced to pulp in a beating engine.—A. P.-C.

A-3. Algerian Mallow. Paper Making, Jan. 1921, xl, 1, P. 28. An article by L. VIDAL describing Algerian mallow and its fibers. The useful portions of the plant can be separated in the field by means of a special retting process which is both simple and practical and requires but little water. A raw and impure tow amounting to 10 per cent of the dry weight is obtained. After carding and weaving it can be made into cordage and burlap while as a raw material for papermaking it could be used directly.—A. C.

A-3. Paper from Alfa Pulp. World's Paper Trade Review, Jan. 7, 1921, xxv, 1, p. 6. Production of pulp from alfa is to be undertaken in France. This pulp will be dry so that transportation charges will be reduced and cost price less in proportion. Cellulose made from alfa is well adapted for the manufacture of smokeless powder.—A. C.

A-3. Raw Materials for Papermaking.—RAYMOND FOURNIER. **Papier,** xxiii, 248-9 (Nov. 1920). A plea for the utilization of the various straws and grasses, and more especially of reeds, which are so abundant in France, to free the French paper industry from its dependence on foreign sources of supplies, as it is impossible for it to supply its needs by wood from its own territory.—A. P.-C.

A-11. Colloidal Clay. Paper Maker's Monthly Journal. Jan. 15, 1921, lix, 9. A section on Clay and Clay Products is included in the third annual report of the Department of Scientific and Industrial Research on colloidal chemistry and its general and industrial applications, dealing with the plasticity and binding qualities of clays.—A. C.

A-11. The True Nature of China Clay. China Clay Review, Dec. 1920, xi, 19, p. 630. The conclusion of a series of articles by ALFRED B. SCARLE. China clay consists of extremely minute particles, chiefly a compound of aluminum, silicon, hydrogen and oxygen united in a manner as yet not fully understood. The precise chemical nature of these particles is of lesser importance than their physical properties, the chief of which are their very small size, the colloidal nature of their surface and their resistance to heat. These properties are allied with many others.—A. C.

B-0. The Training of a Forester. Dr. C. D. HOWE, **Can. For. J.** July, 1920. Page 334.—C. L.

B-2. Tree Fencing to Block Snow and Sand. B. M. WINEGAR, **Can. For. J.** April, 1920, Page 147. Work of the Canadian Pacific Railway in substituting planted tree fences for portable board fences, to prevent the blocking of the track by drifting snow and sand. —C. L.

B-2. Profits of Tree Planting in France. B. E. FERNOW, **Can For. J.** April, 1920, Page 153. Describes reforestation of sand dunes in four regions of France. This work was begun systematically in 1786 and has been remarkably successful, not only in restoring these waste areas to productivity but also from the financial viewpoint.—C. L.

B-2. Ontario's Tree Incubating Plant. Can. For. J. May, 1920, Page 241. Describes the nursery and planting work of the Ontario Forestry Branch.—C. L.

B-2. Replanting France's Ruined Forests. Can For. J. June, 1920, Page 273, C. L.

B-2. Reforestation and Pulp Companies. R. W. LYONS, **Can. For. J.** July, 1920, Page 341. Describes nursery and planting work of the Laurentide Company —C. L.

B-2. Reclamation of Pennsylvania's Desert. GIFFORD PINCHOT, **Can. For. J.** July, 1920. Page 347. Forest planting work by the State of Pennsylvania. —C. L.

B-2. New Forests for Nova Scotia's Barrens. FREEMAN TUPPER, **Can. For. Mag.** October, 1920, Page 469.

B-3. A New Reference Map for Aerial Purposes. By STUART GRAHAM, **Can. For. J.** Page 186.—C. L.

B-3. Price Brothers Aerial System. Can For. J. July, 1920. Page 337, Describes the work of this company in connection with aircraft.—C. L.

B-3. Can Timberlands be Fire Insured? W. R. BROWN, **Can. For. J.** July, 1920, Page 362.—C. L.

B-3. Air Maps for Flying Patrols. Can. For. Mag. Aug.-Sept., 1920, Page 406.—C. L.

B-3. Developments in Fire-Fighting Equipment. G. GERALD BLYTH. **Can. For. Mag.** October, 1920, Page 465.

B-4. How Paper is Made. J. N. STEPHENSON, **Can. For. J.** April, 1920, Page 157. Describes briefly the process of manufacture of Canada's most important manufactured product.—C.L.

B-5. Use of Aircraft in Forestry and Logging. ELLWOOD WILSON, **Can. For. Mag.** October, 1920, Page 439.—C. L.

B-7. Canada's Job in Handling Forests. Dr. C. D. HOWE, **Can. For. J.** April, 1920, Page 169. A brief review of the forestry situation in Canada and of the urgent need for adequate protection and management of our forests.—C. L.

B-7. Quebec Plans for Systematic Cut. G. C. PICHE, **Can. For. J.** April, 1920. Page 192.—C. L.

B-7. Can Canada Achieve Europe's Profits? Can. For. J. May, 1920, Page 233. Discusses Canada's forest areas and possibilities of large revenue from forest protection and management.—C. L.

B-7. Has the Hour Arrived for Constructive Forestry? ELLWOOD WILSON, **Can. For. J.** June, 1920, Page 267. Discusses the proposed policy of the Quebec Government looking toward the management of Crown forests on a sustained yield basis.—C. L.

B-7. Abitibi Company's Forestry Work Forges Ahead. Can. For. J. June, 1920, Page 293. Describes forest survey, forest nursery and forest research work of the Abitibi Power and Paper Company.—C. L.

B-9. The Forestry Situation in the U. S. Colonel W. B. GREELEY, Chief Forester, **Can. For. Mag.**, Aug. Sept., 1920, Page 410. Advocates the growing of more timber rather the use of less timber.—C. L.

E-2. Treatment of Sulphite Waste Liquor. U. S. patent No. 1,298,477, V. DREWSEN, assignor to West Virginia Pulp & Paper Company, U.S.A. **Chimie & Industrie,** iv, 233 (Aug. 1920). The liquor is boiled under pressure with excess of alkali for a sufficient length of time to precipitate the lignin compounds. The remaining solution or organic salts is evaporated and distilled in the presence of strong alkalis.—A. P.-C.

E-2. Recovery of Sulphur Dioxide in Sulphite Cooking. U. S. patent No. 1,327,666, J. P. V. FAGAN and H. G. SPEAR (assignors to the Brown Company) and R. B. WOLF, Berlin, N.H., Jan. 13, 1920). **J. Soc. Chem. Ind.**, xxxix, 226A (March 31, 1920. During the last portion of the cooking operation the gases and vapors which are usually blown with the digester contents into the blowpit, are blown into a condenser from the top of the digester and the SO_2 recovered.—A. P.-C.

E-2. Acetone from Sulphite Waste Liquors. U. S. patent No. 1,298,476, V. DREWSEN, assignor to West Virginia Pulp & Paper Company, U.S.A., **Chimie & Industrie,** iv, 233, (Aug. 1920). Excess of NaOH is added and the mixture is heated for several hours under pressure. The lignin compounds thus produced are precipitated and separated from the liquor containing lactonic acids and other products of transformation. They are dried and distilled with steam to obtain acetone and higher homologues.—A. P.-C.

E-2. Coating Compound from Waste Sulphite Liquor. Fr. patent No. 494,695, J. WINGEN, Holland, June 6, 1919. **Chimie & Industrie**, iv, 228 (Aug. 1920). Sulphite Waste liquor is mixed with a solution of an acid sulphite to which is added coloring matter, clay, chalk, and silicates. Oils, fats, hydrocarbons, etc. may also be added. This mixture gives a very hard coating which can be applied as a single coat of sufficient thickness on all materials, even on tar, carbolineum, etc., and which possesses the elasticity and hardness of cellulose and can be used for oil painting or lacquering. For use as a finish, chalk, with or without clay is added to the prepared sulphite waste liquor. For use as a mastic, it is sufficient to add to the foregoing some chalk, a fat or an oil or some hydrocarbons, to prevent too rapid drying. The disagreeable odor is masked by the addition of amyl acetate. As the coating is hygroscopic it should be covered immediately with paint or varnish.—A. P.-C.

E-5. Manufacture of Pulp from Slightly Lignified Plants. Ger. patent No. 301,716, M. LUDERS, Magdeburg, Aug. 30, 1916. **J. Soc. Chem. Ind.**, xxxix, 226A (March 31, 1920). (See also **Pulp & Paper,** xviii, 301, March 19, 1920). Materials such as jute, manila, bullrush, typha, flax straw and flax waste, hemp straw and hemp waste, nettle straw, etc., are digested in a closed vessel under pressure with a weakly acid $MgSO_3$ solution which according to the degree of lignification of the material, may contain up to 90 per cent of its SO_2 in the combined state.—A. P.-C.

L-5. Preparation of Stable Viscose Solutions. Dilute Acids. Ger. patent No. 314,712, C. F. HILDEBRANDT, Hamburg, Dec. 22, 1917. **J. Soc. Chem. Ind., xxxix, 227A (March 31, 1920).** Moss of peat is digested with dilute acids at a temperature below 100° Cent. and under atmospheric pressure without subsequent treatment with alkaline liquors, and the process is arrested before saccharification commences. After washing, or partial or complete neutralization, the pulp obtained may be employed as fodder or for the production of paper, nitrocellulose, etc.—A. P.-C.

Preparation of Stable Viscose Solutions. Ger. patent No. 312,392, R. LINKMEYER, Barby, and H. HOYERMANN, Hanover, Nov. 17, 1917. **J. Soc. Chem. Ind.**, xxxix, 227A (March 31, 1920). Viscose solutions are treated with substances which contain amide, or imide groups or are capable of forming such groups.—A. P.-C.

F-2. Recovery of Resin-like Substances from Black Liquor. Ger. patent No. 314,418, C. S. FUCHS, Heppenheim, Feb. 14, 1918. **J. Soc. Chem. Ind.**, xxxix, 241A March 31, 1920). Lignic acids obtained by the alkaline treatment of vegetable materials are converted into resin-like substances by the action of oxidizing agents, e.g., chlorine. The products obtained by the action of halogens on the lignic acids derived from straw are readily soluble in acetone, amyl acetate, and "Propol" (Bayer) and form a hard tenacious, lustrous surface after evaporation of the solvent.—A. P.-C.

F-2; K-2. Sizing and Finishing Material from Straw Pulp Waste Liquor.—Ger. patent No. 315,536, Veredelungs-gesellschaft fur Nahrungs-und Futtermittel m.b.H., March 28, 1918. **Rev. Prod. Chim.** xxiii, 453 (Aug. 15, 1920)—The waste liquor from the treatment of straw by the soda process is neutralized and the resulting precipitate kept moist. The neutralization may be effected by inorganic or organic (formic, acetic) acids, carbon dioxide, by salts the acid radicle of which acts as neutralizing agent and the basic radicle of which precipitates in the liquor (Al formate, $CaCl_2$, $MgCl_2$).—A. P.-C.

G-5. Pulp Thickener. Fr. patent No. 504,661, JOSEPH DENOEL, Belgium, Oct. 8, 1919. Papeterie, xlii, 739-42 (Aug. 8, 1920). Description of the Denoël pulp thickener. (For description and discussion of the principle on which it operates see **Papeterie** xlii, 50-60 (Jan. 25, 1920); 98-107 (Feb. 10, 1920); 146-51 (Feb. 25, 1920); 194-203 (March 10, 1920); **Pulp & Paper,** xiii, 729 (July 8, 1920).—A. P.-C.

K-2. Production of Cleaning Material from the Waste of Paper Industry. Ger. patent No. 306,461, REIS und CO., Friedrichsfeld, Sept. 18, 1917. **J. Soc. Chem. Ind.**, xxxix, 227A (March 31, 1920). Addition to Ger. patent No. 303,302, **J. Soc. Chem. Ind.**, xxxix, 15A (Jan. 15, 1920). The alkali in the liquor is partly replaced by salt, and the treatment is effected in the cold; e. g., the waste is treated with a liquor containing 40 parts of NaOH to 60 parts of NaCl for 3 to 4 hours.—A. P.-C.

K-6. Papermaking from Waste Paper. U. S. patent No. 1,326,349, C. T. CROCKER, Fitchburg, ass. U.S.A., Dec. 30, 1919. **J. Soc. Chem. Ind.**, xxxix, 227A (March 31, 1920). A continuous stream of pieces of waste paper is subjected to the action of a hot alkaline solution by causing each oncoming piece of paper, as nearly separate as possible, to be submerged in and moved through the solution, to facilitate the exposure of its surfaces to the action of the solution for the purpose of removing or neutralizing the ink or other material fixed to the surface. The pieces of paper are then removed from the solution and freed from the major portion of the adherent liquid, exposed to the air to cool and treated in a washing machine.—A. P.-C.

K-6. Process for Esparto Pulp. Fr. patent No. 505,001, EMILE ARNOULD, France (Seine-et-Marne), April 26, 1920. **Papier,** xxiii, 180 (Aug. 1920); **Pape-**

(Continued on page 596.)

PULP AND PAPER NEWS

It is with great regret that one takes note of the fact that the Canadian Senate has refused to pass the Research Institute Bill. This ill-advised action (as we consider it) on the part of the Senate seems to have been based on economical grounds. But, if so, then it is a glaring example of false economy—and not merely of false economy but, as it happens, of poor logic as well. For surely it is illogical in the extreme that, when millions upon millions of public money are being expended on the Government railways which show no prospect of becoming self-supporting, the Senate should refuse to sanction the expenditure of only $1,000,000 on a project necessary to the maintenance of the export business which is so vital to the industrial life of the country. And this at a moment when we need—and need profoundly—to concentrate on the costs of production in order to maintain our export markets. The Senate's attitude in this matter cannot fail to have an adverse effect on practically all the big industries of Canada, and particularly on the Pulp and Paper industry which it had been resolved to link up with the commencement of the Research Institute. The attitude in question, moreover, seems to betoken a very curious lack of understanding of the necessity of governmental cooperation with business, under present-day conditions. In a European country, the comparatively small assistance asked would have been given gladly, and almost as a matter of course, in the knowledge that eventually it would benefit the entire country. The Senate's action has been all the more disappointing as, in view of the fact that the Research Institute Bill was a Government measure, it had been confidently expected that it would pass the Senate—as it did the House of Commons—without adverse comment.

The United States prices on newsprint are in process of being announced as we go to press. The indications are that a considerable reduction will be effected.

His many friends will be glad to hear that, according to a letter received from him by the secretary to the Canadian Pulp and Paper Association, Mr. Edward Beck, in charge of publicity for that organization, has had a good voyage on his trip to Scandinavia, where he has, doubtless, arrived by now. Mr. Beck writes that he was able to take his meals with a regularity which those of us who do not relish the mighty ocean's sportive ways, cannot help but envy. His fellow passengers, he added, included Scandinavians, Russians, Germans, French, Japanese and one or two Americans. He and his son, who accompanies him, were the only Canadians on board.

The strike at the Jonquieres and Kenogami plants of Price Brothers, pulp and paper manufacturers, has been ended. It is reported the employees have the firm's offer of a 20 per cent cut in wages and the open shop.

Yesterday witnessed the beginning of the second month of the paper-makers' strike, and no settlement has been arrived at. The largest company, the International, it is reported, states that it will not reopen its mills except on the open shop basis, a basis ruling in the Province of Quebec. At the beginning of the strike, it was estimated that the manufacturers had about two months' supply on hand. One of those months has passed, although it may not mean that all the paper publishers are buying into that surplus, instead of using their storings. In any event one month has passed. The mills effected are the Abitibi, Spanish River, and Fort Francis in Canada, and the Union Bag and Paper Company, Hanna Paper, Minnesota and Ontario Paper, Cliff Paper, Pettibone Paper, International Paper and St. Regis Paper, in. These companies produce the largest percentage of paper produced in North America, and their mills are closed, the opening time being unknown at present. Then withdrawal from the production of newsprint cannot but be considered significant. It diminishes the supply of newsprint by that amount, and helps in the stabilization of the market.

The third annual convention of the National Lime Association will be held at the Hotel Commodore, New York, June 15-17. This is the nineteenth gathering of Lime Manufacturers, and the programme contains a number of fine topics for discussion. The subjects which seem most likely to interest pulp and paper makers are: Kiln Efficiency, by Richard K. Meade, who has studied the recovery of lime in soda mills; The Art of Lime Burning, by George B. Wood, of Rockland, Me.; Standardization—Government Research and Industrial Development, by Dr. S. W. Stratton, of the Bureau of Standards; all of which come on the 15th, and a Symposium on the Special Properties and Merits of Lump Lime, on the 16th.

Mr. Hampshire, of the J. C. Wilson Company, Montreal, was in Toronto a few days last week on business.

Mr. George Davidson, of the Howard Smith Paper Company's Toronto office has returned from a business trip through the Canadian west to the Pacific Coast.

The current issue of the Canada Gazette contains the announcement of a change in the name of the Beveridge Paper Company, Limited, to that of Beveridge Supply Company, Limited.

Found guilty of assaulting Mr. George Warwick, of Warwick Bros. and Rutter, manufacturing stationers, Toronto, Harry Charles, his chaffeur, was remanded for sentence by Judge Coatsworth in the County Court Sessions in Toronto. The evidence showed that Charles, who is a returned man and who was the only one of his battery to escape death in the war, was dismissed by Mr. Warwick for appearing at the garage in a drunken condition. The assault followed the dismissal.

B. J. Avery, forester in the employ of the Spanish River Pulp & Paper Mills Co., Ltd., told the Timber Commission in Toronto last week that when all the improvements contemplated in the three mills of the company were in they could use up 368,000 cords of wood.

In 1921 the company was cutting 324,000 cords, as against 240,000 cords in 1919, said the witness. With all improvements in and running full head the mills cut 368,000 cords.

Mr. I. H. Weldon, head of the Provincial Paper Mills, Limited, spent a few days in Ottawa last week attending a meeting of the Book and Writing Paper Section.

A business visitor to Toronto last week was Mr. Frank McAllister of the Parsons Trading Company, New York, paper merchants and exporters.

Mr. W. H. Sherriff, of the Hodge-Sherriff Paper Co., Ltd. Toronto, selling agents for the Wayamagamack kraft mill, returned to Toronto last week after a trip through the Canadian West to the Pacific Coast. He describes trade throughout the west as rather quiet with the same conditions prevailing there as in the east.

Mr. S. F. Duncan, secretary-treasurer of the Provincial Paper Mills Limited, Toronto, spent several days of last week at the company's mill in Port Arthur.

Mr. H. B. Donovan of the Canada Paper Company's office in Toronto visited the Montreal office of the firm last week for the first time since his recent illness. His many friends in the paper trade will be pleased to learn that Mr. Donovan s now pretty well restored to health.

The directors of the Red River Paper Co. of Winnipeg, have completed arrangements for the enlargement of the mill whereby U.M. Waite of the Reliance Mill & Trading Corporation, New York, takes over the management of the plant. Mr. Waite is well known in the pulp and paper line, being connected with several Canadian companies. John Ball, of the Reliance Mill & Trading Corporation, has been elected a director of the Red River Paper Mills and also John Brassington, chief engineer of the Port Arthur Shipbuilding Co., Port Arthur.

The Detroit Sulphite Pulp & Paper Co. has commenced shipping spruce pulpwood from Port Arthur to Detroit. The loads are being taken on at Nipigon Bay. Chas. W. Cox of Port Arthur, who has been in charge of the camps of the Detroit company all winter, says that he expects to export 20,000 cords of wood for the firm during the present summer.

The Canadian Forestry Exhibition car, which was sent out from Ottawa in the interests of education along the lines of forest preservation, has been visiting several points in New Brunswick, and much interest has been developed in the splendid revelation which the exhibit presents. Moving pictures are shown in connection with the demonstration for the benefit of school children.

CANADIAN PRODUCTION FOR APRIL.

According to the Bulletin of the Newsprint Service Bureau, the 16 Canadian mills reporting for April produced, in that month, 69.221 tons; a daily average of 2.662 tons. This is at 85.3 per cent of capacity. For the first four months, the average production rate was 84.7 per cent as compared with 101.6 per cent in the first four months of 1920. Mill stocks, April 30, were 21,632 tons as compared with 11,484 tons. in 1920.

If you are going on the great trip to the St. Maurice Valley mills, tell the Secretary at once. If you are not going, tell him that.

EXPORT PAPER CO. CONCENTRATES ON NEWSPRINT.

This is the day of specialists. The Canadian Export Paper Co. was formed several years ago to bring under one organization the export sales of the newsprint production of several of the larger Canadian newsprint paper mills. This arrangement not only eliminated considerable friction but made it possible to place orders in the mill which could most economically manufacture the goods and could most expeditously fill the order. This combination of economy and service has been of value and a great factor in the success which has attended the operation of the company.

During the war it fell upon Canadian mills to supply some importers in foreign lands with papers that they could not get from their usual source and the Export Paper Company formed a Specialties Department under the direction of Mr. Norman E. Wainwright. Canadian book and writing papers and other products other than newsprint which were thus distributed have now become an especial factor in Canada's paper exports and have found favor in many countries. However, with the growing sense that Canada must continue to become a more and more important supplier of newsprint for the world's printing press the Canadian Export Paper Co., foresees the need of concentrating on the service for which it was originally formed. By an agreement with the mills, therefore, the company will resume its original function of handling only newsprint and the business of the Specialties Department will revert to the mills which had formerly supplied those papers.

Mr. Wainright has been appointed to take charge of the export business of the Howard Smith Paper Mills and has this week taken up his work with that organization. His first move will be to get a comprehensive view of the world situation and first hand information with regard to markets for the products of the company in foreign fields. For this purpose he will make a tour of the world and expects to sail the latter part of this month. Mr. Wainwright will also serve the Provincial Pulp and Paper Mills in the distribution overseas of the book papers made by that company, the arrangements having been consummated this week when Mr. Wainwright visited Mr. I. H. Weldon, head of the Provincial organization, in Toronto, for this purpose.

R. B. Morley who has been general manager and secretary-treasurer of the Ontario Safety League for seven years has been appointed secretary-treasurer of the Industrial Accident Prevention Association. This latter is an organization which was formed under the Workmen's Compensation Act, for the purpose of preventing accidents in industry in Ontario and offers a wide field for work.

Mr. Morley's knowledge of public safety work will not, however, be lost to the Safety League as he will be retained in an advisory capacity and so be in a not. The lost inches increase the cost of the paper dustrial and public safety in Ontario.

The Cycle of Trade; The one real example of perpetual motion

1 High prices produce a surplus of goods
2 Surplus of goods produce low prices
3 Low prices produce scarcity of goods
4 Scarcity of goods produces high prices.

—"National," January, 1921.

(Continued from page 593.)

terie, xlii, 790 (Sept. 10, 1920). See Fr. patent No. 118,376; **Papier**, xxii, 344-5 (Dec. 1919); **Rev. Univ. Papeterie**, iii, p. 9, (Jan. 15, 1920) **Paper**, Aug. 18, 1920; **Pulp and Paper**, xviii, 917-8 (Sept. 2, 1920).—A. P.-C.

K-10. Sizing Paper. Ger. patent No. 307,694, O. RUFF, Breslau, Jan. 19, 1918. **J. Soc. Chem. Ind.**, xxxix, 227A (March 31, 1920). The paper pulp is first made neutral or alkaline, then treated with an alkaline solution of condensation products of phenols and formaldehyde, and finally acidified. The finished paper is heated for about one hour at 120° Cent. in a drying chamber, or passed slowly over the rollers of a drying machine heated to 120° Cent. to 140° Cent.—A. P.-C.

K-10. Beater-sizing of Paper or Cardboard Stock. Ger. patent No. 303,828, Zellkoll, C.m.b.H., Germany. **Chimie & Industrie**, iv, 234 (Aug. 1920). The sizing is carried out with easily dissociated organic aluminum salts.—A. P.-C.

K-10. Sizing Paper and other Absorbent Material. Ger. patent No. 303,925, Holzverkohlungs-Industrie Akt. Ges., Germany. **Chimie & Industrie**, iv, 234 (Aug. 1920). The paper is treated with alkaline solutions or suspensions of condensations products of tarry aldehydes and the sizing agent is precipitated by the addition of an acid. — A. P.-C.

K-10. Sizing, Waterproofing, Finishing, etc., Paper. Ger. patent No. 305,525, W. SCHMIDT, and E. HENFER, Germany. **Chimie & Industrie**, iv, 234 (Aug. 1920). The pulp or fabric is treated with peat or coal tar, either in a very finely divided insoluble condition, or as a tar soap; and by the action of an acid, by double decomposition, or by formaldehyde, the tar is precipitated in an insoluble form on the fibers.—A. P.-C.

K-11. The Manufacture of Easily Folded Paper or Board. Ger. patent No. 314,641, J. M. VOITH, Heidenheim, July 25, 1918. **J. Soc. Chem. Ind., xxxix,** 227A (March 31, 1920). Webs of paper pulp on a flat or cylindrical machine, with an uninterrupted wire surface are combined at the wet press with webs made on a machine, the wire of which is partly covered.—A. P.-C.

K-11. Wooden Jackets for Paper Machine Press Rolls. Ger. patent No. 308,069, F. H. FULLNER. **Chimie & Industrie**, iv, 234, (Aug. 1920). The invention is characterized by the special shape of the metal core which has dovetail shaped grooves into which are fitted strips of wood; these are put in dry, and have a little play, but they swell up as soon as they are wetted and become very firmly fixed.—A. P.-C.

K-20. Process for Making Parchment Paper and Vulcanized Fiber. Eng. patent No. 124,979. The Manchester Oxide Company, England. **Chimie & Industrie**, iv, 233 (Aug. 1920). Same as U. S. patent No. 1,333,465, **Paper**, xxvi, 235, (1920).—A. P.-C.

K-23; L-7. Process for Improving Paper or Pulp Fabrics. Ger. patent No. 303,861, Exportingenieure fur Papier-und Zellstofftechnik G. m.b.H., Berlin-Wilmersdorf, Sept. 30, 1915. **J. Soc. Chem. Ind.**, xxxix, 185A (March 15, 1920). The fabric, preferably after treatment with a swelling agent, such as NaOH, ammoniacal copper solution, lactic acid, etc., is subjected to fulling, either dry or damp, in order to compress. Albumin may be used both as a swelling and finishing agent, added either after the fulling or after the drying; it is preferable to add to it small quantities of acids or alkalis to increase the swelling effect and the case of the penetration of the albumin into the fiber, and of a hydroscopic substance to reduce the hardness of the fabric. If the fabric is to be exposed to wet conditions a water-repellent substance such as wool-fat should be added.—A. P.-C.

K-23. Copying Paper. Australian patent No. 9,265, C. HARGRAVE, Australia. **Chimie & Industrie**, iv, 234 (Aug. 1920). The paper is immersed in a solution of tannin (extract of Eucalyptus gum) and of glycerin, to prevent drying. A soluble black is then added. The paper which is to receive the coating is plunged in a solution of iron sulphate containing 100 g. per liter.—A. P.-C.

K-23. Waterproof Paper. U. S. patent No. 1,345,476, A. L. CLAPP, July 6, 1920. **J. Soc. Chem. Ind.**, xxxix, 595A (Sept. 15, 1920). Fibrous paper pulp containing a soluble soap is treated with $Ca(OH)_2$ to precipitate the calcium soap, and aluminum resinate is then precipitated in the product.—A. P.-C.

L-4. Paper Containers. Paper Container, Feb. 1, 1921, iv, 2. The fourteenth article of a series describing the process of making cartons or folding boxes. A summary of the preceding articles is also given.—A. C.

L-5. Lowering the Hygroscopicity of Artificial Silk. Ger. patent No. 316,045, LOUIS FESSMANN, Nov. 26, 1918. **Rev. Prod. Chim.**, xxiii, 453 (Aug. 15, 1920). The fibers in thin layers, are heavily pressed between two rolls to make them denser and less hygroscopic.—A. P.-C.

L-5. Artificial Silk for Textiles. Br. patent No. 116,-103, Deutches Gasluhlicht A.-G. (Auerges.), May 22, 1918. **J. Soc. Chem. Ind.**, xxxix, 595A (Sept. 15, 1920). Artificial silk is permanently loaded by treatment with the by-products of thorium manufacture, which contain cerium, lanthanum and didymium in the form of a solution of 40 to 50° Bé. (sp. gr. 1.38-1.53), drying and treating with alkaline gases as NH_3 or CH_3NH_2. The fiber becomes swollen. The loaded material may be bleached with 2 to 3 per cent solution of Na hydrosulphite. Dyeing should precede the loading treatment.—A. P.-C.

L-5. Manufacture of Cellulose Acetates. U. S. patent No. 1,347,801, J. O. ZDANOWICH, London, England, July 27, 1920. **Chem. Met. Eng.**, xxiii, 540 (Sept. 15, 1920). Same as Br. patent No. 139,232. See **J. Soc. Chem. Ind.**, xxxix, 483A (July 15, 1920)—A. P.-C.

L7. Process for Impregnating Yarns and Fabrics of Paper. Ger. patent No. 303,926, O. RUFF, and P. PRAETORIUS, Breslau, March 21, 1917. **J. Soc. Chem. Ind,**. xxxix, 226A (March 31, 1920). Aqueous solutions of phenols with formaldehyde and alkali are heated together, but not long enough to permit the separation of insoluble products, and are then used for the impregnation of paper materials. By heating the latter further, insoluble condensation products are formed. To add to the strength of the fabric, a further treatment with formaldehyde may be used.—A. P.-C.

L-7. Impregnation of Paper Fabrics. Ger. patent No. 312,686, Deutsche Pyroxit Gesellschaft m. b. H., Germany. **Chimie & Industrie**, iv, 232 (Aug. 1920). The fabrics are impregnated with wood tar, either pure or diluted, and then sprinkled with zinc oxide.—A. P.-C.

L-0. Insulating Compound. Ger. patent No. 304,239, 304,240, "Lipsia" Chemische Fabrik, July 8, 1915. **Rev. Prod. Chim.**, xxiii, 453 (Aug. 15, 1920). By means of waste liquor from the potash industry fibrous material is coated with a deposit of $MgCO_3 3H_2O$ which on drying is converted to a basic carbonate, giving a light product of low thermal conductivity.—A. P.-C.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, May 28. — The past week has shown a fairly stable condition in the pulp and paper trade, which has caused some men in the business to wonder if prices had at last struck rock bottom. Certain it is that there have been signs of a returning confidence and stability in a number of lines and unlike most weeks of late, that just closed has witnessed no price reductions. There has also been some very nice business passing in some lines and although the depressed conditions have by no means been dissipated there is, perhaps, a brighter tone pervading the industry than for some months past. One contributing cause may be mentioned in the fact that as this letter is being written there appears to be a very good prospect of the negotiations between the employing printers and employees in Toronto resulting in a settlement of the dispute over the demanded 44-hour week and increased wages without recourse to a strike which is due on June 1st, if a compromise is not reached. Conferences have been held all this week between representatives of the Typothetae and the International Typographical Union and it is stated today that the chances of an avoidance of a strike are good. This should have the effect of further steadying the paper market. There is also a feeling of confidence that the striking employees in the newsprint mills will be back at work within the next two weeks. The Canadian mills affected, notably Spanish River, Abitibi and Price Bros. have been closed down about two weeks now and amongst the Toronto papers at least there has been no shortage of newsprint. These Toronto newspapers offices depending upon the striking plants for their newsprint supplies have stocks on hand sufficient for some time yet. If they run short arrangements have been made for supplies from non-striking mills so there does not appear to be any prospect of a serious shortage during the duration of the trouble.

PULP.—According to the Toronto representative of one of the big pulp mills the pulp situation is brightening up somewhat and conditions generally with respect to raw stock are showing some signs of improvement. It is stated that stocks in the hands of the mills and the jobbers are gradually being reduced, although it is conceded that the threatened strike among the printers is having a deterent effect on the turnover and sale of pulp throughout Canada. Several of the mills report that the month of May has shown a considerable loosening up in pulp shipments and one mill stated that the sales during the present month have exceeded any month since January last. No. 1 bleached sulphite is quoted at 6½ cents; easy bleaching, 4 cents; new grade sulphite $70 a ton and groundwood from $30 to $40, although sales of the latter are said to have been made at slightly below these figures. Generally speaking there is no fixed market price for any of the lines and deals are being made without respect to any standard price values.

PULPWOOD.—High prices were paid during the winter for pulpwood in the Port Arthur district, from $12 to $16 a cord being the ruling quotations, while ties are being contracted for at 95 cents a piece, which is the highest price ever received for this class of wood. There will be a cut of about 166,000 cords of pulpwood, 500,000 ties and about 750,000 feet of lumber. The market for pulpwood throughout Canada remains unsettled and according to Toronto contractors there is no set price for any of the product.

BOOK PAPER.—The book paper market continues to be in a very unsettled condition and the same applies to bonds and ledgers. While it is stated in some quarters that the bottom of the market has not yet been reached, a Toronto representative of one of the big Canadian mills stated that he believed that there would be no further reductions for some time—if at all, although, he said, things were in such shape that a drop might come any time. There is no fixed price for any line of book paper. There are very few buyers amongst the jobbers and consumers are apparently using little, for the turnover is the smallest it has been for months. The mills are getting no big orders and the runs are small. A hand-to-mouth consumption about describes the situation, a condition which the threatened strike of printers is only partially responsible for. Certain it is that no wholesaler, retailer or printer it taking any chances on stocking up these days when they do not know how far the market is going to drop nor what the possibilities for future demand and consumption are likely to be. As far as can be learned no improvement in trade has been noticed although those mills which are supplying publishing houses with paper have some good contracts and in some cases are running full.

WRAPPING PAPER.—There have been no changes in the prices of wrapping papers for several weeks. The market appears to have steadied down somewhat but the demand is still off and manufacturers and jobbers are complaining of small business. The mills are still keen after sales but the jobbers are loth to stock up and there is comparatively little stock on hand with any of the dealers. Jobbers report that the holiday had a rather up-setting effect on business but anticipate that the close of the month will prove a fairly satisfactory volume of business to have been done during May.

GREASEPROOF AND GLASSINE.—With several of the Canadian mills closed down there is very little business doing in these lines of paper, although one mill reports some enquiry from abroad for Canadian lines which may develope into business later on. Just now, however, the export demand is practically nil and there is very little domestic demand. The Lincoln Paper Mills at Thorold, which are large manufacturers of glassine and greaseproof, have been closed down for some time, but hope to reopen shortly. There have been no changes recently in the prices of the two lines of paper mentioned.

TOILETS AND TISSUES.—Toilet papers are now practically down to pre-war prices and tissues are not far from that basis. Manufacturers report the market fairly fine, no change in price having occurred since May 9th. The mills report that considering the paper trade depression, they are doing a fairly good volume of business and admit that the situation could be a good deal worse. While sales are not big in any line of light

weight papers they bulk fairly large in the total and generally speaking there is an optimistic tone to the trade.

NEW YORK MARKETS.

New York, May 28—(Special Correspondence).—While business in the various kinds of paper at present is of moderate scope, it is no where near what it normally is, and it can be stated that the market is still in a quiet condition. Demand is almost entirely against actual and immediate requirements, and it is no secret that the average user of paper board today is not consuming usual amounts of goods because of the dullness prevailing in his own line. However, it can also be said that the situation is no longer going backward. Such change as is developing in the market is toward improvement. The recession in demand seems to have been definitely checked, and buyers are gradually though slowly increasing their operations as respects the absorption of paper supplies.

Here and there is a bright spot in the market which, owing to the general quietness, stands out in much prominence. For example, coarse tissue papers are in growing demand and activity in this branch of the market is one of the encouraging features of the present situation. Mills producing this class of paper are understood to be running at close to full capacity and prices in this connection are holding distinctly firm. The great bulk of demand is for tissue towels, napkins and toilet papers but it is authoritatively stated that sufficient orders are being placed for these kinds of paper to keep tissue mills quite busy. The newsprint market also is steadily working into a stronger position. Doubtless the firmness exhibited in this branch of the paper trade is due more to the strike of paper and pulp mill workers than to any other cause, but the fact remains that increasing buying interest is being shown in newsprint and quotations appear to be stiffening.

Apparently offerings of so-called "distress" lots of newsprint is the only factor keeping prices on this kind of paper from rising. Manufacturers are firm in their views and are insistent on the quotations named, but second hands are frequently placing newsprint on the market at concessions in price which gives publishers the idea that values are not as steady as they in reality are. It has been recognized for some time that the man in between the manufacturer and consumer of of newsprint—not so must a jobber or distributer as the speculator—had a good deal of paper stored up when the market commenced to break last year, and these same stocks are still waging a deterrent influence on the market situation, probably more so now than in recent months. It stands to reason, however, that such holdings will in due time be entirely liquidated, and if present manufacturing conditions continue, everything is in favor of a rise in print paper values. At least some publishers realize that current production of newsprint is far below normal, and they are coming into the market off and on, picking up such supplies as are to be had at what they consider attractive prices, largely with the idea of protecting themselves should the strike last long enough to be creative of a shortage of paper. Dealers say that because of the wide publicity given the surplus stocks of newsprint at the time the strike of mill operatives was declared it is a difficult matter to convince newspaper publishers that it is a wise thing for them to buy because of a probability of a scarcity developing.

There is no change in the book paper situation. The market is swinging along at an even gait, with the bulk of activity involving deliveries by mills on contract. Manufacturers are maintaining quotations although in frequent cases they are accepting orders at figures under those they quote, yet they are not publicly naming lower prices. Machine finished book is holding at between 6.50 and 7 cents per pound at mills for average quality, while super book is quoted at around 8.50 cents and coated at 10 cents upwards.

There is a fair demand for kraft wrapping paper and prices rule steady at 6.50 to 7 cents a pound at mills for No. 1 domestic kraft and half a cent less on No. 2 grade. Jute wrappings are favored with but a slight demand, but producers are not slashing quotations in an effort to stimulate buying, evidently figuring that when consumers are in need of supplies they will quickly make known their wants and meet the prices asked.

Box boards are moderately active. Signs are that most of the buying is being done by boxmakers with a view to covering forward requirements, as the average box plant is far from busy, yet there is more business current than there has been in recent weeks and box manufacturers seem pretty well satisfied that board costs are about as low as they will go. Plain chip is selling at $30 to $35 per ton at mills, with filled news board quoted at $32.50 to $37.50 f.o.b. mills.

GROUND WOOD.—Mechanical wood pulp is in a rather uncertain market position. So many varied reports are heard regarding the situation that it is difficult to determine just what the actual market condition is or what really constitute market prices. Some say the strike of mill hands and the resultant drop in production has made for a decidedly stronger tone and that prices are advancing; others assert that demand remains dull and that pulp can be obtained at just as low prices as before the strike. A fair range of quotations would seem to be between $30 and $35 per ton at grinding mills, depending on the haul to the consuming point and the freight involved. Indications are that inquiry is much improved though there is no concrete proof that actual buying has expanded to any material degree.

CHEMICAL PULP.—About the only change of note reported in the chemical wood pulp trade is a further decline in prices on Swedish pulps. According to cable advices to New York import houses, the Swedish manufacturers' association has established new quotations of 4.50 cents per pound landed here on easy bleaching sulphite, 4 cents on No. 1 unbleached sulphite and 3.75 cents on kraft pulp. These prices represent reduction of between a quarter and a half cent per pound from previously ruling levels, and bring foreign pulp down to nearer a parity with prices on domestic fibre. Foreign bleached sulphite, the bulk of which comes from Norway, is still quoted at an average of 6.50 cents per pound ex the dock on this side, with now and then an offering noted at slightly below this figure.

News grade sulphite is probably the strongest item in domestic pulps and is being held for around 3.75 cents a pound at producing mills. There is at least some supply of domestic bleached sulphite available at less than 6 cents notwithstanding that leading produc-



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INQUIRIES SOLICITED:

ers of this kind of pulp continue to ask 6.50 cents in the open market.

A shipment of 125 bales of wood pulp arrived at New York this week from Hamburg, representing the first imports from Europe at this port in several weeks.

RAGS.—Although some of the low grades, chiefly roofing stock, are in fair call, paper manufacturers on the whole are according little attention to rags at present and the market is in a dull position. Prices are irregular and on a broad range. Some dealers are firm in their views and are holding stocks at comparatively firm levels, whereas others who are hard pressed to turn rags into money are accepting any reasonable bids that are registered. Roofing rags are a shade higher, about the minimum packers will consider being 75 cents per hundred pounds on No. 1 packing and 65 cents on No. 2's, and it must be said the market has every appearance of being fairly well sold up on this class of material. Old No. 1 repacked whites are offered at 6 to 6.25 cents per pound at shipping points, without attracting much buying, and new No. 1 white shirt cuttings are available to mills at 9.50 to 10 cents, washables at 5 cents, blue overall cuttings at 6 cents, light silesias at 6.50 cents, repacked thirds and blues at 2 cents and black stockings at 2 cents.

PAPER STOCK.—Waste paper is in about as firm a market position as any other description of paper-making raw material. In fact, there is a decidedly firm tone to prices on some grades of old paper and it is not the easiest thing in the world to locate sizable amounts of these kinds of stock. Soft white shavings are held by packers at a minimum of 2.25 cents per pound at shipping points for No. 1 packing, and old No. 1 kraft paper is quoted firmly at 1.60 cents or higher. White news cuttings have sold at 1.50 cents, and this is about the lowest dealers will consider on further orders, while flat stock is inclining upward in value at a quotable basis of one cent to 1.05 cents a pound on No. 1 heavy books and magazines. There is but a scattering demand for hard white shavings, which are quoted at 3 cents upward a pound at shipping points on No. 1 grade. Folded newspapers continue to be available at 35 to 40 cents a hundred pounds f.o.b. New York and No. 1 mixed paper at 25 to 30 cents, though in the Middle West and in sections of the East other than New York slightly higher prices prevail.

OLD ROPE AND BAGGING.—Old manila rope finds a fairly ready sale to paper mills at around a stationary price of 4 cents per pound at shipping points. Old bagging is mainly neglected and it is hard to say what market values actually are. No. 1 scrap bagging is offered by dealers at one cent per pound, roofing bagging at 50 cents a hundred and gunny bagging at about 1.25 cents per pound.

News From Our Advertisers

ECONOMY OIL BOXES (Patented).

Paper mill operators are annoyed with the leaking of oils from dryer bearings, causing framework and floor to be soiled and greasy and the edges of the dryer felts to decay. To secure the necessary lubrication in dryer bearings excessive amounts of oil are poured in by operators, not only making the "mess" so often seen, but causing an extravagant use of lubricants and in addition frequent renewals of expensive dryer felts.

Many mills are using grease, which is unsatisfactory, nasty and dirty, and very expensive.

The Economy Oil Box was invented by a practical man on a paper machine. It is very simple, consisting of a reservoir in the top of the cap of the dryer bearing. This contains oil, which is taken from the reservoir by threads of "candle wicking" by capillary attraction and is deposited on a piece of felt the width of the dryer journal which distributees the oil on the journal. If one strand of the candle wicking is sufficient that is all the oil that is fed to the dryer bearing; if that is not sufficient two or three strands may be used, but when the amount is determined the regulation is positive, continuous and reliable. None of the dirt that may be in the oil is carried over, only fresh, clean lubricating oil, and it is entirely the fault of the operator if any excess oil reaches the journal and thereby oozes out on the dryer head.

The regulation is so easily controlled that operators will minimize the amount of oil used. The box is of sufficient size to hold enough oil for approximately two weeks' run but should be filled once a week.

Note: The felt which is between the oil reservoir and the journal is simply fastened to the edge of the box by clips and does not extend into the oil; it is simply the means of distributing the oil across the entire face of the journal. The *wicking* feeds the oil.

It is an automatic and reliable oil box devoid of any complicated or delicate parts and free from any adjustments, and feeds just the amount of oil required.

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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., June 9th, 1921. No. 23

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

THE CRAB DOES IT.

One of the most peculiar characteristics of the crustacean frequently seen on the beach is that it progresses backwards. Reverse motion is also possible for higher animals and even with men. A great difficulty in such circumstances, however, is that it is difficult for one to see whether he is going, or, if the object is seen by glancing backward, the vision is frequently distorted. An instance of an attempt to emulate the lowly crab occurred recently at Ottawa when the bill for the National Research Institute which had been warmly approved and supported in the House of Commons was killed in the Senate. The opponents of the bill apparently tried to cover themselves under the plea of economy and with the statement that it was wiser to postpone such action at the present time. As far as our observation goes, it is customary to plant the crop in the spring rather than wait until it is time to gather the harvest. One cannot hope to plant and to reap at the same time, it is only by planting now that we may expect to obtain results later on. We are disappointed that a majority of Senators cannot see the advantage of supporting a measure which will provide Canada with what is becoming one of the fundamentals of progressive nationality. Without organized science available to assist in the industrial and economic effort of the country an opportunity is being missed which cannot otherwise be made up.

While there will be regret in many quarters that the Research Institute bill did not succeed the first time to pass all the barriers at Ottawa, those who believe in its importance and efficacy should not be unduly discouraged. No doubt the Senators who opposed the bill acted according to their best understanding of the situation; it is quite probable that they acted rather in ignorance than prejudice. While a fair amount of publicity has been given to the results of the work which has been done under the direction of the Advisory Council for Scientific and Industrial Research, nothing like an adequate campaign has been carried on to inform the public and particularly the law makers, with the advantages and the necessity of inaugurating such an institution as the Research Institute would be. Canada must have an organization of this kind if we are to become the industrially important nation which our natural resources will give us the right to be. Success in industrial competition depends on quality, cost and service. The first depends on the skill and character of the workmen; the third on the attitude of the management, and the second on the application of science to the manufacture and distribution of goods. The Research Institute would affect directly one of these principal factors, namely, that of cost of production, and as this is a vital factor in competitive selling, developments along this line would be most helpful to Canadian industry and the whole country would derive the advantage from efforts along this line. We feel sure that if the Senators had had a proper conception of the purpose and possibilities of the Research Institute and a comprehensive vision of the possibilities of the development of our Canadian industries through the application of Scientific Research there would scarcely have been a dissenting voice when the bill was introduced. Let us hope that the measure will not long remain in the waste basket but that it will be introduced again, and backed by the vigorous and enthusiastic publicity which it deserves, there will be no question of its passing. It is possible, however, partially to redeem the situation by giving greater encouragement and assistance to the organizations doing work along the lines laid out for the Institute and which are now on the road to decay for want of proper attention. The views of the majority in the House should have the effect of emphasizing the need for scientific research in Canada along such lines as it is most appropriate for the Government to act and to assist. Let us hope that such work as is being done and should be, but owing to lack of adequate funds is not being, done at the Forest Products Laboratory will now receive recognition, attention and such financial assistance as will make the laboratory the help to the Canadian people that it should be.

THE GOVERNOR-GENERAL.

It seems that Canada just begins to get acquainted with the Governor-General when his term of office expires and his successor is appointed. The Duke of Devonshire has completed his service as the personal representative of the King in the Dominion of Canada. He and his household have entered enthusiastically into the life of the people here and many Canadians feel honored in sharing their friendship and acquaintance. The Duke has travelled extensively and has visited many of Canada's pulp and paper plants. He has taken a keen interest in the industrial life of the Dominion and its growth. The democratic spirit of the man is reflected in the happy way in which his children have participated in appropriate sports and in the kindly and helpful way which the Duke, and Duchess too, have joined in patriotic and welfare work. Their departure will be noted with general regret but they may feel sure that they leave many friends behind and a

warm welcome whenever they may return to Canada.

A happier choice for the successor to the Duke of Devonshire as Governor-General of Canada can hardly have been made than is conveyed by the announcement that Lord Byng is to represent His Majesty on this side of the water. Lord Byng needs no introduction to Canada. As commander of the Canadian troops in France General Byng won the confidence and love of so many Canadians that he will find a very cordial welcome in the Dominion. It is not necessary to recite the many qualifications of Lord Byng for this position and we can do no more than hope that his stay in Canada will be as happy as we expect it will be.

A VERY GENEROUS ACT.

Some time ago we referred to the very excellent report by Mr. J. C. Wright, of the Federal Board for Vocational Education on his investigation into the fundamental requirements for the various pulp and paper mill jobs and his analysis of the work required of employees in different positions. The report was published serially in the Paper Trade Journal and was later reprinted by them for the use of the Joint Committee on Vocational Education without expense except for the negligible item of the cost of paper for the covers.

Five hundred copies were sent to the Secretary of the Canadian Pulp and Paper Association for distribution in Canada to those interested. The Secretary was under the impression that these were to be paid for and was therefore greatly and agreeably surprised when his cheque was returned with a very courteous letter from the Paper Trade Journal. Kindly acts such as this are continually cementing more closely together the ideals and affections of Canadians and Americans and it is a great pleasure to us to give credit for their courtesy and generosity to our contemporary in New York.

COBWEBS.

The difference between the groundwood pulp which sold last year at $130 and this year at $30 is $100.

Mr. O. Grattan Esmonde leaves Canada by request of a British Columbia court. His name sounds as if he had committed macaroni.

The Rolland Paper Co. is helping the public to appreciate Canadian papers by sending out a series of twelve folders on fundamental factors in papermaking. The first one, on "Rags," has just been issued.

There is a big fuss in Ontario over a Dominion Government Bill to control the flow of water in the Rainy River. The trouble seems to be in the Dominion's responsibility for an international waterway, and in the fact that both Manitoba and Ontario are affected. Ontario is interested in the development of water powers, both by private interests and by the Hydro.

Those who are still blessed with a mother and those who have only memories of mother's love, will sympathize with Sir William Price and his brothers and sisters in the loss of their mother, who has just passed on at the age of 81.

An employee of the Wayagamack Pulp and Paper Co. turned a compressed air hose on Willie Nault, who, as a result died of peritonitis. The company has been condemned to pay his widow $10,000. This death and fine are an awful penalty for an act of carelessness. There must be some way of putting more of the burden on the careless man.

Getting back to normal! The new price of newsprint is to be 4¾ cents. Whether it will go any lower will depend on whether the cost of production can be further decreased and whether competition from Europe can scare American and Canadian producers into a price-cutting contest.

The Minister of Forests and Mines for New Brunswick, through the Chief Forester, has prepared a fine set of placards urging greater care in regard to fires in the woods. The statements are forceful and the lettering is well done on metal. They should be a considerable help in preventing fires.

FRANK H. MILHAM DEAD.

Frank H. Milham, recognized as one of the leading paper manufacturers in the Middle West, died recently at Pasadena, California, the victim of a heart stroke. Mr. Milham, who at the time of his death was still active head of the Bryant Paper Company of Kalamazoo, Mich., was a successful executive whose extensive business connections included the following: President of the Eddy Paper Company, managing director of the Munising Paper Company, director in the Kalamazoo Vegetable Parchment Company, the Illinois Envelope Company, the Nashwaak Pulp and Paper Company and the Whalen Pulp and Paper Company. Mr. Milham was also director in the Kalamazoo National Bank, the Home Savings Bank, and other local Kalamazoo concerns. He served two terms as Mayor of the Michigan paper city and was at one time head of the Chamber of Commerce there. Mr. Milham is survived by a wife, a daughter, three brothers and two sisters.

Before the customer receives a shipping memo, it must undergo a lot of wear and tear. When the memo form is printed on tough, strong Writing Manilla, it's bound to reach its destination in better shape.

Don't miss the Technical Section Trip to Three Rivers, Shawinigan Falls and Grand Mere, leaving Montreal Tuesday evening, June 14. Advise the Secretary AT ONCE, if you want a Berth.

Sulphite Tests of Average Wood, Infected Wood and Chipper Dust

By JOHN S. BATES.

The plant experiments described in this paper were carried out last December and January in the Kenogami Mill of Price Brothers & Co., Limited. The writer while Technical Superintendent had the full assistance of the operating staff and wishes to acknowledge especially the co-operation of Mr. L. B. Decker, Sulphite Superintendent, and Mr. Charles Tennier, Wood Room Superintendent. The information is published with the consent of the company, in the hope that it may be of general interest to the pulp and paper industry.

Some years ago the yields of sulphite pulp from the various digesters were noticeably higher than at present and the first run was made on average pulpwood to find the reasons by careful measurements. A second commercial run was made on selected rotten or infected wood to compare the results, in view of the recent practice of saving balsam fir trees affected by decay. Following tests of sawdust losses in connection with chipping pulpwood, a third cook was made on the fine wood material rejected by the chip screens as a possible means of utilization in preference to burning in the boiler house. The tests were considered in relation to the regular sulphite for newsprint and board products.

Run No. 1 was based on average pulpwood taken from the block pile where it had been stored since the summer. A period of from one to three years had probably been required for cutting, river-driving, slashing, drum barking and stacking. On account of the weathering of the blocks it was not possible to identify species. Probably the wood ran about 75 per cent balsam fir and 25 per cent spruce (white and black) within reasonable limits. The wood was affected by partial rot to the extent of about 10 per cent of the total, the infection being largely in the balsam fir.

Preparing and Sampling Wood:

In preparation for the run 10 cords were measured in detail in the wood room and 7 cords were merely racked and counted in the yard. On passing through the wood room a few blocks required removal of small pieces of bark by scraping or by occasional use of the knife barker, the blocks in general being only washed by water spray. The wood was thrown off the conveyor in lots from fifty to a hundred blocks at a time, taking everything of 2-foot lengths but passing short ends of logs. The blocks were weighed in lots of ten on a Fairbanks 500-lb. scale. Each block was measured for length and diameter, and then immersed in a measuring cylinder to determine solid volume directly to one-hundredth of a cubic foot. This measuring cylinder proved very convenient, being made of a 12-inch wrought iron pipe 42 inches high with screwed flange and wooden base and having a gauge glass attached 12 inches from the bottom with a sliding scale graduated in hundredths of a cubic foot by direct calibration with water. The blocks were then piled in a one-cord rack 10 ft. long by 6.4 ft. high (128 cu. ft. for 2-foot wood) in such a way that the top blocks did not project above the upper line of the rack, and the count of blocks per cord was noted.

When the wood was chipped for the sulphite run, the total weight of sawdust coming through the chip screens was subtracted from the total weight of wood as racked to give the total weight of chips. Average moisture contents of sawdust and chips were determined separately and total oven-dry (moisture-free) weights of sawdust and chips were calculated, the sum of these representing the total oven-dry weight of wood as racked and giving the basis for calculating average moisture content of the original wood. This procedure for moisture figures was followed because solid wood is hard to sample and because it had been noticed that the moisture was slightly higher in sawdust than in accepted chips, perhaps on account of ice or water on the surface of the wood being carried through the bottom chip screens.

The first estimation of rot was made by judging the percentage volume of infected wood in each block. Heart rot was the most common and the weathering of the ends tended to obscure some of the reddish-brown color. The second estimation of rot was made by carefully sorting about 50 lbs. of chips sampled throughout the chipping operation. This appeared to be a reasonable way of determining the proportion of infected wood, although care had to be taken not to include the grey weathered wood and the sound yellow chips with the brown infected wood. By this separation of sound and infected chips the oven-dry weights and the moisture contents were compared. Nothing was attempted in the way of determining the degree of rottenness, as the methods are rather vague and it would be hard to prepare a small representative sample of infected wood for chemical analysis. In general the affected portions were of a decided brown color, although rotting had not proceeded to actual punkiness to a very great extent.

When the digester was ready, the conveyors and screens were cleared, the measured blocks were chipped and the screened chips were run directly into the digester till filled to the usual level. One 4-knife chipper and one 3-knife chipper were used in conjunction with two inclined chip screens having top plates with 1¼-inch round holes and bottom plates with ¼-inch round holes and a Lombard crusher to break and return the large chips. The coarse saw-dust formed by chipping and crushing was collected from the conveyors below the chip screens, weighed in boxes on a Fairbanks scale and sampled throughout to determine the average moisture figure. The accepted chips were sampled at short intervals for moisture test. Care was taken to make sure that only the measured chips entered the digester. The volume of the digester was calculated from the builder's blueprint and, after loading, the empty space at the top was measured to calculate the actual volume occupied by the chips. The figures showing the degree to which the chips packed in the digester were then open to calculation.

As a numerical expression of chip sizes the composite sample of chips was graded in the laboratory chip testing screen. This apparatus of special design consists of a wooden frame into which slide five or six sieves 24 inches by 36 inches in size built like drawers, the bottom in each case being standard screen wire (W. S. Tyler Co.) and the meshes ranging in standard steps from 1.05-inch openings downward;

the nest of sieves is supported from the floor on an oscillating frame of pipe fittings and is shaken horizontally by an eccentric at about 200 revolutions per minute and with 3 inches oscillation. This tester was also used for grading sawdust samples in the later runs, in which case ordinary 8-mesh and 14-mesh wire had to be used in the lower sieves in the absence of standard screen wire of the smaller sizes.

Cooking and Sampling Pulp:

The digester was cooked under the ordinary conditions applying at that period for newsprint sulphite. After blowing and washing, the pulp was pumped from the blow-pit to the stock tank and through the regular series of centrifugal screens. Care was taken to run the system clean before and after the test. The No. 1 Sulphite of newsprint grade was all run over wet machines instead of into the slush line, and the laps were weighed on trucks and sampled throughout for average moisture content. The screenings were refined as usual in Sturtevant Emery Refiners and run over a wet machine, the lot being weighed and sampled for moisture. The partly cooked chips and knots rejected by the knot screens located first in the series were collected by settling in a large box on the discharge line and measured for dry weight. White water and other losses were observed to be small, but were not measured. The yields of pulp were calculated to show the various relations to cordage and weight of wood for the three grades of product, as shown in the tables.

Testing the Pulp:

Sample sheets of No. 1 and No. 2 pulp were made up on the laboratory sheet machine without beating the pulp. Some of the sulphite knots were beaten in the laboratory ball mill and the fibre passing through a 20-mesh sieve was made up into sample sheets. The three sets of sheets were pressed and air-dried in the usual way and tested for average bursting strength in the Mullen tester.

Composite samples of No. 1 lapped pulp were opened up with minimum beating effect in the laboratory disintegrator, which consists of a 3-inch brass propeller rotating at about 1,200 revolutions per minute in a cylindrical shell and driven by a vertical shaft so that the propeller operates with downward thrust in a pail of stock. The disintegrated pulp was tested for comparative freeness in the Green drainage tester regularly used on groundwood pulp at an oven-dry consistency of 0.4 per cent and a temperature of 20 degrees Centigrade. To further compare the regular product with the special fibres from infected wood and sawdust, another sample of disintegrated pulp was carefully graded by wet screening through a nest of 8-inch Tyler standard laboratory sieves ranging from 20-mesh to 200-mesh to show the variation of fibre sizes.

Run No. 2 on infected pulpwood was carried through in the same manner as above (except that all the wood is measured in detail) and the cook was made in the same digester for direct comparison with regular pulpwood. During the week previous to the test rotten wood was collected in the wood room by throwing decidedly infected blocks off the conveyor. It was impossible to identify species but the selected wood was almost all balsam fir. This fact should be taken into account in interpreting the results, because the lower yields were due largely to the higher proportion of balsam fir and only slightly to the presence of decay. Heart rot was universal and about half

WOOD MEASUREMENTS			
Average Measurements.	Run No. 1 Average Wood	Run No. 2 Infected Wood	Run No. 3 Chipper Sawdust
Species approx., balsam fir,—%	75	100	75
" " spruce,—%	25		25
2 foot blocks per cord	237	195	
Length, inches	23.64		
Diameter, inches	6.2		
Solid wood per cord,—cu. ft.	97.7	92.0	
Wet weight per cord,—lbs.	4,503	4,500	
Moisture,—%	51.1	57.29	
Oven-dry weight per cord,—lbs.	2,202	1,922	
Oven-dry weight per cu. ft.,-lbs-	22.54	20.9	
Blocks showing rot,—%	26	100	
Rot by estimating blocks,—%	7	44	
Rot by sorting chips,—%	11	46	
Moist. in sorted rotten chips,—%		60	
Moist. in sorted sound chips,—%		51	
WOOD FOR ONE DIGESTER			
Measured wood, —cords	17.1	18.0	
Wet weight,—lbs.	77,000	81,005	
Moisture,—%	51.1	57.29	
Oven-dry weight,—lbs.	37,650	34,592	
Wet weight of sawdust,—lbs.	4,450	5,046	50,175
Moisture,—%	54.78	61.89	58.0
Oven-dry wgt. of sawdust,—lbs.	2,010	1,923	21,070
Sawdust,—%	5.34	5.5	
Sawdust,—cords	0.91	1.0	9.8
SCREENING TEST OF SAWDUST			
Retained on 4-mesh,—%		2	1
Between 4 and 8-mesh,—%		32	23
Between 8 and 14-mesh,—%		44	43
Passing 14-mesh,—%		22	33
Wood recovered as chips,—cords	16.19	16.96	
Wet weight of chips,—lbs.	72,550	75,759	
Moisture,—%	50.87	56.99	
Oven-dry wgt. of chips,—lbs.	35,640	32,584	
Vol. of chips in digester,—cu. ft.	4,446	4, 493	2,722
Oven-dry weight of chips per cu. ft.,—lbs	8.02	7.25	7.74
Volume of chips per original Cord, cu. ft.	260	250	
Volume of chips per net cord, cu. ft	275	265	278
Volume of solid wood in chip space,—%	35.5	35.0	34.2
SCREENING TEST OF CHIPS			
Between 1 in. and ¾ in.,—%	22	18	
Between ¾ in .and 2 in.,—%	31	36	
Between ½ in. and ⅜ in.,—%	22	23	
Between ⅜ in. and ¼ in.,—%	20	19	
Passing ¼ in. (4-mesh),—%	5	4	

of the wood mass was affected, some blocks showing practically 100 per cent of discoloration and others as low as 20 per cent. The frequency of large blocks pointed to the greatest trouble being in the butt logs of balsam fir. In general the infected portions were reddish-brown in color and the wood still firm, although some of the blocks were punky and occasionally hollow. It was not possible to state exactly how rotten the wood was, except in the manner described. However, in this respect the whole mass served as a test of quality in the sulphite run.

Run No. 3 on sawdust formed during the chipping and crushing of regular pulpwood presented an interesting experiment in relation to the runs on average and infected wood. With medium-sized chip screen openings and insufficient screening area a large proportion of the chips were going through the crusher, so that the sawdust from this source had been running higher than normal in addition to the sawdust formed from frozen wood in the chippers. The question arose as to the suitability of this waste material for making sulphite pulp to be used in small proportions in newsprint or board products in place of sending the sawdust to the boilers as low-grade fuel. The sawdust has the same composition as average pulpwood and nearly the same degree of cleanliness, but there is some objection to leaving it mixed with

Table II. SULPHITE COOKING DATA

	Run No. 1 Average Wood	Run No. 2 Infected Wood	Run No. 3 Chipper Sawdust
WOOD MEASUREMENTS			
Digester No.	2	2	1
Size inside shell,—ft.	14x47	14x47	11x46.8
Vol. of lined digester,—cu. ft.	4,650	4,650	3,076
Portion unfilled at top,—cu. ft.	204	157	354
Net vol. of chips,—cu. ft.	4,446	4,493	2,722,
Proportion of digester filled,—%	96.0	96.6	88.5
Cooking acid at 27°C., gals approx	20,000	20,000	11,000
Total sulphur dioxide,—%	4.70	4.93	5.12
Free sulphur dioxide,—%	3.68	3.87	4.00
Combined sulphur dioxide,—%	1.02	1.06	1.12
Digester steamed	Dec. 20	Jan. 10	Jan. 3
Time to pressure,—hrs.	2¼	2¼	2¾
Total cooking time	9¾	9¼	15½
Pressure, lbs. per sq. in.	65	65	60
Maximum temp., degrees C.	148	150	138
YIELD OF NO. 1 SULPHITE PULP.			
Weight of laps,—lbs.	47,965	45,320	32,770
Average air-dry pulp,—%	35.29	32.83	31.92
Wgt. of air-dry no. 1 Pulp,—lbs.	16,927	14,879	10,460
Air-dry pulp per original cord-lbs	990	827	
Cds original wood per ton of pulp	2.02	2.42	
Yield of oven-dry No. 1 pulp based on oven-dry weight of chips—%	42.71	41.1	44.67
Mullen test on unbeaten hand Sheets points per lb.	0.59	0.65	0.52
Freeness test of disintegrated pulp in green tester at 0.4% and 20°C., [c. c.	670	670	633
creening test of disintegrated pulp			
Between 20 and 65 mesh,—%	84	75	67
between 65 and 100 mesh,—%	3	4	6
Between 100 and 200 mesh,—%	3	4	3
Passing 200-mesh,—%	10	17	24

Table III. PULP MEASUREMENTS

YIELD OF NO. 2 SULPHITE PULP (Refined Screenings)			
Weight of laps,—lbs.	3,165	3,340	555
Average air-dry pulp,—%	34.24	39.07	42.93
Weight of air-dry No. 2 pulp,—lbs	1,084	1,305	238
Air-dry pulp per original cord, [—lbs.	63	72	
Yield based on No.1 pulp,—%	6.4	8.8	2.3
Yield on oven-dry No. 2 pulp based on oven-dry weight of chips, [—%	2.74	3.6	1.02
Mullen test of unbeaten hand [sheets points per —lb.	0.67	0.63	0.44
YEILD OF KNOTS, ETC. FROM KNOT SCREENS			
Weight of wet knots,—lbs.	835	1,640	None
Average Air-dry pulp,—%	22.9	26.86	
Weight of air-dry knots,—lbs.	191	441	
Yield based on No. 1 pulp,—%	1.13	3.0	
Yield of oven-dry knots based on oven-dry weight of chips,—%	0.48	1.2	
Mullen test of beaten hand sheets, points per —lb.	0.80		

regular chips on account of the danger of plugging digester strainers and the doubt about yield in the quick-cook process at high temperatures.

In prepartion for the test, a pile of sawdust sufficient for the smaller digester was collected in the wood-room from the material coming through the ¼-inch round holes of the bottom plates of the flat chip screens. The conveyors and chip loft were cleared and the sawdust fed directly into the digester. The sawdust was handled in three boxes, each holding 8.83 cubic feet levelled off and every fourth load was weighed before dumping on the belt conveyor. The boxes were counted and the average net weight used as a basis for calculating the total weight of sawdust. Every second load was sampled to determine the average moisture content which was somewhat higher than that of regular chips. The digester was cooked with live steam at rather low pressure and temperature, and therefore required a longer time than for chips. This was done to obtain fairly uniform circulation and to prevent plugging of the strainers and loss of sawdust through the relief line. No particular trouble was met with and the pulp was carried through the system in the usual way.

Summary of Results:

The results are summarized in the tables and require little explanation. A few points may be referred to briefly. As the cord is a variable measure in relation to actual volume and weight of wood, the figures in this connection are subject to some allowance and are not as definite as the true weight figures. The results quoted in terms of air-dry pulp are on the usual basis of pulp containing 10 per cent of moisture.

In Run No. 1 the average pulpwood averaged only 6·2 inches in diameter and was straight, thereby racking closely to give 97·7 cu. ft. of solid wood per cord. The wood was light in weight due to the high proportion of balsam fir (about 75 per cent), as shown by the oven-dry weight of 2,202 lbs. per cord or 22·54 lbs. per cu. ft. The total wood required for the digester suffered a loss of 5·34 per cent of sawdust at the chip screens. The yield of No. 1 sulphite pulp for newsprint paper was equivalent to 2·02 cords of original wood. The sample sheets showed fair quality with the presence of a considerable number of shives. The yield of No. 2 sulphite pulp in the form of refined screenings amounted to 6.4 per cent of the No. 1 pulp, this proportion depending a good deal on the character of wood and the methods of cooking and screening. The sample sheets showed satisfactory strength and quality suitable for board products. The partly cooked chips and knots were not measured very accurately and the true yield may have been about 2 per cent of the No. 1 pulp. The sample sheets showed that the knots could be refined to strong, brown pulp for the tougher grades of board.

In considering the production of sulphite pulp from the test it is apparent that there was obtained about all the wood could produce. This is shown by the total yield of oven-dry pulp amounting to 45.93 per cent of the oven-dry weight of wood in the digester. Comparing this test with a corresponding test made in 1913 in the same digester, the yield from the same number of cords was about 20 per cent less than seven years ago. This is probably explained by the much higher proportion of dense spruce at that time.

In Run No. 2 the infected wood was noticeably larger in size than average pulpwood, the number of 2-foot blocks per cord being 195 (including many split blocks) compared with 237 for regular wood. Rot therefore appears to be more extensive in the older trees and butt logs. Owing to irregularity the solid volume per cord was only 92 cu. ft., or 6 per cent less than average wood. Rotten wood seems to hold more moisture than sound wood. The selected wood was lighter on the dry basis than average wood, as shown by the comparative weights of oven-dry wood per cu. ft., 20.9 and 22.54; this difference was largely due to the infected wood being nearly all balsam fir, and the unit weight was slightly lower than the unit weight of sound balsam fir. It therefore appeared that decay had not caused much loss of wood substance, in spite of brown discoloration, etc., to the extent of 45 per cent of the total mass. The loss of

sawdust, the sizes of chips, the details of cooking and other conditions were about the same as in Run No. 1.

The yield of No. 1 pulp was 7.44 tons compared with 8.46 tons for average wood. For true comparison the yield on the oven-dry weight basis was 41.1 per cent of the wood against 42.7 per cent for average wood, showing very little real difference. The strength, freeness, action on the newsprint paper machines and quality in general were surprisingly close to regular sulphite, although the color was more of a dull yellow and the screening test showed more fine fibres. The yields of No. 2 pulp and knots were a little higher than usual the wetter wood due to the absorbent action of decay probably having some bearing on this. The total yield of No. 1 pulp, screenings and knots was 45·9 per cent of the chips on the oven-dry weight basis, or exactly the same as in Run No. 1. The results showed that infected wood is still good for sulphite, at least provided that decay has only discolored the wood without reducing it to soft punk. The testing was not carried to full detail such as chemical analysis of the wood and pulp, bleaching quality, etc., and complete results might have brought out more differences from regular sulphite. However, the test cook served the purpose of showing the general comparison of infected and average wood for newsprint sulphite pulp.

In Run No. 3 the chipper sawdust represented average pulpwood reduced to a finely-divided condition. The material was practically all smaller than 4-mesh size and about one-third was fine enough to pass a 14-mesh sieve. On the other hand the particles were not as fine or broken up as ordinary sawdust from slashers or sawmills. In general the particles had their greatest length in the direction of the grain of the wood, which would help to preserve the fibre length of the pulp. The moisture content was 58 per cent, being higher than for regular chips (about 51 per cent). The sawdust packed well in the digester to the extent of 7·74 lbs. of oven-dry wood per cu. ft. compared with 8·02 lbs. per cu. ft. in the case of chips, the slightly closer packing in the latter case perhaps being due to the greater pressure of chips in the larger digester used. The cooking time of 15 hours 35 minutes and the maximum temperature of 138 degrees centigrade show that conditions were milder than for regular newsprint sulphite.

Washing in the blow-pit took a longer time than usual by reasons of the fineness or "slowness" of the pulp. The laps from the wet machine occasionally cracked a little when folding and the pulp was slightly dirtier than usual, but the product was comparatively good in color and general appearance. The yield of No. 1 sulphite pulp screened in the ordinary way was high and amounted to 44·67 per cent of the sawdust on the oven-dry weight basis, compared with 42·71 per cent in the case of average chips. The sample sheets showed fair strength, while the freeness and screening tests and microscopic examination of the disintegrated pulp confirmed the presence of short fibres. The yield of No. 2 pulp in the form of refined screenings was only 2·3 per cent of the No. 1 pulp and there was of course no reject from the knot screens that could be traced to the sawdust cooked. The total yield of No. 1 pulp and screenings amounted to 45·69 per cent of the sawdust on the oven-dry weight basis, which was almost as high as the corresponding figure of 45·93 per cent for average chips in Run No. 1. The sawdust pulp was used in making jute board on the cylinder machine, although it was considered that the fibre would be quite suitable for newsprint if properly mixed with regular sulphite.

RIORDON SHAREHOLDERS TO MEET.

The first official indication of the success of the recent appeal to the shareholders of the Riordon Company, Limited, is contained in a letter sent forward to them on Saturday over the signatures of the executive committee of the directors, under the chairmanship of Frank P. Jones, calling a meeting of shareholders at the Windsor Hotel, Montreal, at 11.15 a.m., Friday, June 10th. The following resumé of the matter is given in the Gazette.

The letter is optimistic in tone, and, while emphasizing the necessity of an immediate and more general response on the part of the shareholders to the appeal for new financing, states that directors find grounds for encouragement in the results already attained. It states that of the minimum of $5,500,000 required by the company as indicated in the directors' letter to shareholders of May 6th, about one half is assured. This result is regarded as sufficiently satisfactory, in view of the physical impossibility of completely covering the shareholders before June 1st, to warrant an extension of time for subscriptions and a continued effort to raise the capital required.

Accordingly, those who have already subscribed, are being requested to extend the time during which their subscriptions are effective, and those who have not already subscribed are urged in the letter to do so without delay.

The meeting of the shareholders is being called to secure their more active and energetic co-operation, particularly in view of the fact that negotiations with creditors are declared to be proceeding in a satisfactory way, and to place before shareholders a full statement of the company's position as revealed in the examination of its affairs by the directors during the past month.

It is stated in the letter that the business of the company has evidenced material improvement during the past thirty days, shipments of bleached sulphite pulp amounting to 4,811 tons, which is approximately 55 per cent of the company's capacity. This figure compares with 1,600 tons for the month of January, and is about 25 per cent in excess of the shipments for the preceding month (April.)

The feeling in quarters in close touch with the company and with the market for bleached sulphite pulp, its chief product, is understood to be decidedly more optimistic than it was a month ago. Given a sufficient working capital, the future of the company appears to be largely a matter of shipments and prices for its products, and it pointed out that the market for chemical pulp is approaching stabilization, the decline in values having preceded and been more precipitate than that in many pulp and paper products, notably newsprint.

Allowance of an extension of time for new subscriptions and the offering of opportunity for free discussion of the company's affairs at a shareholder's meeting will probably be accepted by investors in the company's securities as indications which, while clearly pointing to the absolute necessity of further support from shareholders, may be interpreted as reflecting a measurable degree of confidence on the part of those in charge of the company's affairs at the present juncture.

It is well to know one's limitations, but not to regard one's self as absolutely bound by them.

News From Europe

(Prepared by Dr. Paul Bartholow.)

Pulp and Paper Trade of Norway.

It is not likely, unless a sudden improvement sets in, that the wood pulp market will manifest any life. The mills are not operating, but are awaiting events. It is not easy to estimate how long this state of affairs will go on, but it is hoped that in another month there will be a return to activity. The paper market is also lifeless, few sales being reported at prices, which, as a rule, do not cover the costs of production. Meanwhile in the wood pulp market the situation is unchanged. No improvement is expected until after the coal strike. A curious feature is that the difficulties with which the British paper mill are confronted owing to the coal strike have not yet resulted in a rise of prices. In addition to these factors the seamen's strike and the impending general strike in Norway have affected prices in a manner which the labor leaders find distinctly disturbing. The public remains cool and the paper maker and other manufacturers have decided to "sit tight."—FARMAND, May 12, 1921.

The Effect of the Miners' Strike on Swedish Trade.

The miners' strike continues to paralyze business transactions with England. With regard to the continental trade the occupation of the Ruhr, which is generally regarded as inevitable, has postponed indefinitely the revival of industry. Further developments in connection with the "sanctions" are also awaited with concern. The chemical wood pulp market, in particular, is dead. No sales are reported. Most of the mills, which closed down for two or three months, owing to the strike, are working again in order to have sufficient stocks to meet running contracts, but it is anticipated that in July and August when the warehouses are filled up, the mills will be forced to close down again. A small sale of mechanical wood pulp for the American market is quoted at 200 kroner per not net f.o.b. The price, which is certainly low, has been accepted as a set-off to Finnish and Norwegian competition. Swedish wood pulp mills are badly handicapped by the low rate of exchange on Finnish marks and Norwegian kroner. The newsprint mills in Sweden have have also bought parcels of wet mechanical at 100 kronor per ton net.—AFFARSVARLDEN, May 4, 1921.

The Paper Industry in Switzerland.

During the war Switzerland developed a good many industries designed to supply the needs of the belligerants and of her own population. But with the return of peace and the economy enforced by high prices, consumers stopped buying to a great extent and overproduction was the result. Besides this, many banks and commercial houses had placed funds with neighbouring states, the money of which has greatly depreciated, notably in the case of the German mark and the Austrian crown, which fell to almost nothing. This drop in exchange had several consequences, it closed foreign markets to Swiss goods, restricted credit, and caused many banking difficulties. Another rather extraordinary result was the decision of the Government to restrict the import of German and Austrian goods, which were very cheap, while practically forcing Swiss consumers to buy in countries at much higher prices. What might be expected has happened. The consumer refuses to buy and the Swiss mills, so far from being helped, are closing down. The paper industry, for instance, has been obliged to give into a system of duties which economists call ruinous. At first the business depression in the paper trade was combated valiantly, but gradually mills began to close until at present the lack of business is general. For example Stocklin and Co. of Basle,, and Walty and Co. of Ostringen, and the Utendorf mills have suspended. As regards the paper industry the number of workmen in 1919 was 3500; of these 2000 have been laid off, while many others are working on part time. The effect on imports may be seen from the following table comprising the year 1913 and 1920.

	1913	1920
Grey boards	20,370 tons	34,073 tons
Newsprint	3,323 tons	11,709 tons
Printings, writings	43,681 tons	86,485 tons

Thus imports of newsprint, for instance, increased 50 per cent.—LE PAPIER, April 1921.

Norway and Newfoundland.

Norges Utenrikshandel contains an interesting review of the relative industrial resources of Norway and Newfoundland. It is pointed out that the two countries produce similar things—that their fisheries, paper and pulp mills are the most important industries, and that competition is consequently worthy of notice and careful study. Wood pulp, paper and groundwood mills have a plentiful supply of wood which abounds in Newfoundland. Production is steady. For instance the Anglo-Newfoundland Development Co., which furnishes the Northcliffe group of newspapers, has an output of 200 tons of paper a day. At Bishop's Falls, Reed and Co. produce about 100 tons of pulp a day. A new Norwegian plant is situated on the east coast at Bonavista Bay by Grand River. As is well known it is prepared to make cellulose and paper, and is not inferior in capacity to the new English outfits. The export of props, except from Labrador, is forbidden. In Labrador, however, it is stated that an American and English company for the export of props is in full swing. All signs indicate a great future in paper making for Newfoundland and Labrador.—PAPIR-JOURNALEN, April 23, 1921.

WALL BOARD CASE SETTLED.

Nearly a year and a half ago the Niagara Wall Board Company of Buffalo N.Y. of which John B. O'Brien is President and C. C. Hullinger is Secretary and Treasurer, commenced action against the Tonawanda Board and Paper Company, a subsidiary corporation of the Beaver Companies, alleging breach of contract. After many delays and postponements for trial, a settlement was effected by the Beaver Companies paying $35,150 to the Niagara Wall Board Company.

The Niagara Wall Board Company was founded by the above prominent former officials of the Beaver Board Companies. The Niagara Company operates a board mill and wallboard finishing plant at Penn Yan, N.Y. Its officers and stockholders are also affiliated with the Maie Pulp and Paper Company of Skowhegan, Maine, The Niagara Fibre Company of Penn Yan, N.Y. and the Cornwall Pulp and Paper Company, Limited, Cornwall Ont.

Its own maker would scarcely recognize a yard order after it has passed through the wear and tear of a lumber yard. Writing Manilla fits in for such jobs as though it were made for that one purpose.

The world is largely made up of people who think they could do the other fellow's job better

The International Paper Mill at Three Rivers

A great deal of interest has very naturally centered about the immense pulp and paper plant of the St. Maurice Lumber Co., at Three Rivers, Que. The editor had the pleasure of visiting this plant a short time ago and took a few pictures which are herewith shown. Since that time there have of course, been a number of important developments. It is quite certain for one thing that there is no longer any snow on the premises and that it is not necessary to blast the wood out of the block pile, an operation which is shown in one of the pictures.

The mill when complete, will produce about 240 tons of newsprint per day and this will require about 200 tons of groundwood and 54 tons of sulphite pulp. Any excess production of either grade of pulp can be used in the United States mills of the International Paper Co., which controls the plant at Three Rivers.

The mill is all steel frame covered with concrete and the design and construction is in charge of the Engineering department of the International Paper Co.; Mr. A. H. White is Chief Engineer.

Plenty of Power.

For a mill of this size a considerable amount of power is necessary. Electric current from the Shawinigan Falls Water & Power Company at Shawinigan Falls, will be delivered to the Mill at 66,000 volts to be transformed to 2,200 volts for the grinders, and to 550 for motors for general purposes.



A General view of the Mill, as seen from the top of Pulpwood Stacker.

The Mill will use in the neighborhood of 20,000 h.p.; a large proportion of which will be consumed by the electrically driven magazine grinders.

For driving the paper machines, drying paper, cooking sulphite, etc., there are eight B. & W. boilers, of about 500 rated boiler-h.p. each. Crude oil will be burned under these boilers.

An underground, reinforced, concrete storage tank of 150,000 barrels capacity has been built for fuel oil storage. The oil from tank steamers is pumped into these storage tanks.

To take care of waste from the wood preparing and to furnish some steam, there have been installed five horizontal tubular boilers.

Filter Plant.

All the process water in the Mill will come from the St Maurice River and, that the quality may be of the best, a gravity sand filter of 20,000,000 gallons per 24 hours, has been installed. This filter system was designed and furnished by the Norwood Engineering Company.

Wood Preparation.

This part of the plant, which will be seen from one of the pictures, is located at the river side and the logs are brought up on a Ryther and Pringle parallel chain log haul, cut into 4′ lengths and passed through 12 x 45′ barking drums of which there are 3 supplied by the Canadian Ingersoll-Rand Co. A cable conveyor carries the blocks to stackers which are permanently located. As the pile forms, the wood is conveyed radially by portable extension conveyors laid on the top of the pile. The stacker now installed will take care of 15,000 cords and there is place and provision for the installation of 2 more wood storages. A three strand chain conveyor carries the wood from the pile in winter, or directly from the barking drums in summer, to the pulp mill. At the present time only the sulphite mill is in operation, this being located on the high ground a little back from the river and about on the level of the main floor of the paper mill. The groundwood mill is to be on a level with the sulphite mill. There will be 12 magazine grinders built by the Waterous Engine Works Co.

As the wood passes into the pulp mill it is carefully examined and any pieces insufficiently barked are further cleaned in a Green Bay barker and the wood is thoroughly washed as it passes to the chippers. There are two of these of the Carthage make and the chips pass from them over two Sherbrooke shake screens.



Loosening a "Cap" on the wood-pile. The cloud of smoke from the Dynamite is visible

Oversize chips are treated in a Lombard crusher. A bucket elevator carries the chips to an enormous chip bin. An unusual feature of this bin is that instead of being partially supported by the walls the entire weight is carried on the center columns.

Digester Room.

In this department are two digesters 15 x 47′ built by the Chicago Bridge and Iron Works. Provision is made for a third, which is also true of the blow pit equipment. There are now two blow pits, each with a capacity of two digester charges. After washing in the blow pits the stock is removed to a storage tank where it is continually agitated and from which it is pumped to the Impco knotters and then passes through the Sherbrooke fine screens. The tailings screen prevents loss of acceptable fibre from the knotters.

At the present time two Glens Falls wet machines of the Rogers type run the pulp into sheets which are baled for shipment to the Niagara Falls mill of the International Paper Co. On account of the quality of paper produced at that plant the Three Rivers mill is

now making easy bleaching sulphite and cooking 11 hours. The production of the two digesters operating under these conditions is about 40 tons and they consume from 75 to 80 cords of wood per day. When the full plant is in operation and news grade sulphite is produced the three digesters will make about 90 tons.

In connection with the sulphite plant it should be remarked that a well equipped laboratory has been installed and a competent chemist in charge. This is located adjacent to the Superintendent's office. There is also provided in this department a properly equipped locker room and lavatory.

The Paper Mill.

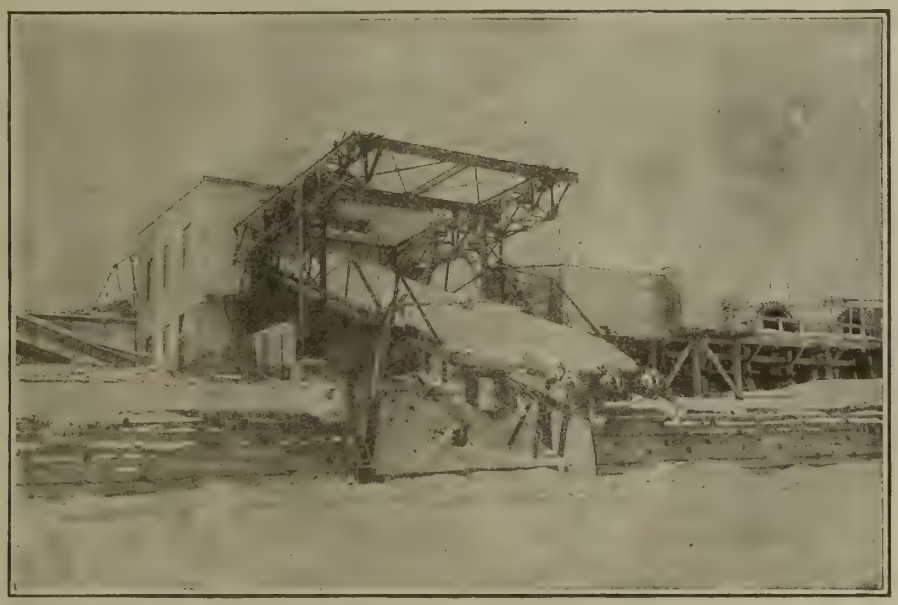
At the time of the editor's visit the walls of the paper machine room were going up and the roof was being laid. The steel work for the machine room floor was in so that a visitor could get at a better idea of the size of this department than simply to mention that this room is 173′ wide and 320′ long. It will accommodate 4 Bagley and Sewall machines each with a 164'' wire. It is understood that they will be equipped with the General Electric Co. type of electric drive and will produce at least 60 tons of standard newsprint each per day.

The whole plant appears to be laid out on generous lines without any indication of being over built. The construction has been carried forward throughout the winter so that the buildings are now practically complete for the first unit.

Technical Section Visit.

The summer meeting of the Technical Section will visit this plant on the 15th of June and the members will then have an excellent opportunity of seeing the newest newsprint mill in Canada and one of which will no doubt prove to be one of the most efficient. After visiting other mills in Three Rivers the Technical Section will proceed to Grand'Mere and see in operation the fastest running newsprint machines in the world which are housed in a fine new machine room at the Laurentide mill and after that, the plant of the Belgo Industrial Co., at Shawinigan Falls, will be visited.

The editor's thanks are due to Mr. T. R. Remsen, construction manager of the St. Lawrence Lumber Co.'s new mill, for much courtesy and attention.



Log Haul-up, and Barking Drums, as seen from the River. Ready for Winter.

CHEMICAL REACTION AFFECTS CASEIN GLUE.

Although casein glues are highly water-resistant, they ultimately decompose when exposed to a damp atmosphere for a long time. For many months studies have been under way at the Forest Products Laboratory to discover the cause of this decomposition.

The decomposition study is still far from complete, but the conclusion has been reached that the decomposition of ordinary alkaline casein glues is not due to the action of bacteria or molds. It appears to be due entirely to chemical action of the alkali in the glue. This conclusion is based upon the following observations:

Increasing the amount of alkali in the glue increases the rate of decomposition when the glue is kept wet.

Glues containing no sodium hydroxide, although deficient in some important respects, do not decompose as rapidly as similar glues containing sodium hydroxide.

Cultures of molds and bacteria could not be obtained from decomposed alkaline glues.

Some chemicals which have antiseptic properties are found to improve casein glue, but this improvement is due to their chemical action rather than to their toxic properties.

Glues can be completely decomposed in a short time at temperatures above that at which bacteria can grow.

Further work is being directed toward the production of glues which will resist chemical decomposition and at the same time be impervious to the action of fungi and bacteria as well as moisture.

The large pulp mills, which have been under construction at Bear River, Nova Scotia, for the past two years, were opened recently, when they turned out their first cooks of sulphate pulp. The cost of its construction was $1,500,000, with an estimated output in value of the same amount. The company has received an order from the United States which will keep the mill in operation for three years, working both day and night shifts, employing over two hundred men. This is the only chemical pulp mill in Nova Scotia.

U. S. PULP PRODUCTION FOR APRIL.

The following is a tabulation by the U. S. Federal Trade Commission of the production and stocks of finished pulp, in tons of 2,000 pounds on an air-dry basis, for April, 1921, compared with April, 1920, for the operating mills. The average production is based upon the reports covering the years 1917, 1918, 1919 and 1920, and the average stocks are based upon the stocks carried for the year 1919 and 1920.

	Number of mills.	Production for month.	On hand end of month.
Ground Wood Pulp:			
April, 1921 . .	162	159,442	217,308
Average . . .		122,746	137,165
Sulphite, News Grade:			
April, 1921 . .	63	50,381	23,345
Average . . .		64,922	19,800
Sulphite Bleached:			
April, 1921 . .	31	22,966	13,707
Average . . .		44,096	8,710
Sulphite, Easy Bleaching:			
April, 1921 . .	9	5,594	776
Average . . .		6,474	1,555
Sulphite, Mitscherlich:			
April, 1921 . .	7	4,102	2,277
Average . . .		6,708	1,655
Sulphate Pulp:			
April, 1921 . .	20	8,910	7,140
Average . . .		13,832	5,908
Soda Pulp:			
April, 1921 . .	25	16,701	9,545
Average . . .		32,968	5,938
Other than wood pulp:			
April, 1921 . .	5	710	194
Average . . .		910	159
TOTAL—for all grades:			
April, 1921		268,806	274,292
April, 1920		350,194	160,515
April, 1919		284,984	241,613
Average		292,656	180,880

Total stocks of all grades of pulp in the mills on April 30, amounted to 274,292 tons. Mill stocks of ground wood pulp and "Other Grades" increased during the month.

Ratio of Stocks to Average Production.

Comparing the stocks on hand at the domestic pulp mills at the end of the month with their average daily production based on the reports covering the years 1917, 1918, 1919 and 1920, the figures show that:

Ground wood pulp stocks equal 46 days average output.

News grade sulphite mill stocks equal 9 days average output.

Bleached sulphite mill stocks, equal 8 days average output.

Easy bleaching sulphite mill stocks equal 3 days average output.

Mitscherlich sulphite mill stocks equal 9 days average output.

Sulphite mill stocks equal slightly more than 13 days average output.

Soda pulp mill stocks equal 8 days average output.

Mill Stocks of "other than wood pulp" equal about 6 days average.

Total mill stocks of all grades equal 24 days average output.

Loss of Production.

The idle machine time of grinders and digesters reported to the Commission for the month of April, 1921, is shown in the attached tabulation. The time lost in April, 1920, is shown by grades and reasons for purposes of comparison. These figures do not include 15 mills not in operation.

Loss of Production.

Grade.	Total. 1921.	1920.
Ground Wood Pulp—		
Number of grinders	442	670
Total hours idle	96,251	72,265
Sulphite News Grade—		
Number of digesters	81	90
Total hours idle	17,808	8,711
Sulphite Bleaching—		
Number of digesters	76	62
Total hours idle	23,099	3,649
Sulphite, Easy Bleaching—		
Number of digesters	7	3
Total hours idle	1,466	1,052
Sulphite Mitscherlich—		
Number of digesters	24	14
Total hours idle	8,902	2,391
Sulphate Pulp—		
Number of digesters	30	29
Total hours idle	9,118	2,752
Soda Pulp—		
Number of digesters	150	61
Total hours idle	41,914	7,887
Other Grades—		
Number of digesters	4	4
Total hours idle	1,536	512
Total number of grinders and digesters	814	933
Total hours idle	200,094*	99,219

*Includes 133,767 hours due to lack of orders.

DR. RALPH E. RINDFUSZ ELECTED SECRETARY OF THE AMERICAN WRITING PAPER COMPANY.

Dr. Ralph E. Rindfusz, assistant to the president of the American Writing Paper Company, has been elected secretary of the big paper-making organization to succeed Michael N. Slotnick, resigned. In addition to his new duties as secretary, Dr. Rindfusz will continue as assistant to the president and will also retain general supervision of the department of chemical research, which will remain under the direct capable management of Dr. L. E. Roberts.

Dr. Rindfusz has taken an important part in formulating the recently announced service plan by which American Writing Paper Company products are being distributed by Eagle-A Service Houses throughout the country. By this arrangement, which is undoubtedly one of the most vital developments in providing printers with their most important raw material, the complete line of Eagle-A papers will be handled in its entirety by every one of a large number of the principal paper merchants of the country. In this way, it becomes of the utmost convenience for printers to obtain the only complete line of fine papers in the world without the necessity of shopping among several distributors, thus resulting in greater service through maximum efficiency and economy in paper buying.

British Trade News

(From Our London Correspondent.)

London, May 23, 1921.—The set back which the British trade has received is attributable, according to Mr. P. W. Holden, the chairman of Wiggins, Teapé, & Co. (1919), Ltd., to overbuying, financial stringency, and collapsed exchanges in various parts of the world. He estimated that about an extra one-third of his firm's output was deposited on the Home Market—a stagnant market—and it was well nigh impossible to do business. A dividend was agreed upon at the rate of 5 per cent. for the year ending 31st December 1920 "upon the amount for the time being paid up or credited as paid up on the ordinary shares, the same to be paid less income tax to the shareholders appearing on the register at the 4th May 1921."

Prince of Wales Visits a Paper Mill.

The Prince of Wales is taking the same amount of interest in the British paper mill, while on a tour, as he did while in Canada on his trip through some of the mills. In fact he had his appetite whetted in Canada for paper and pulp. The Prince is now visiting the Duchy of Cornwall and on his way through Devon he visited the Devon Valley Paper Mill in which Messrs. Wiggins, Teape & Co., are interested. He took a great interest in all the departments and two workers with 65 years service and 36 years were introduced to him. One of the great sights arranged for the Prince was an inspection of the papermaking machines, he became fascinated with them and spent some time listening to an explanation as to how they were working. When the inspection was over he asked to see all the men who fought in the Great War and he had a good shake of the hand for each man on his lucky return home.

Paper Makers State Their Case.

For some weeks past I have been writing on the Anti-Dumping Bill and the efforts of the British Papermakers to get paper brought within its scope. "Free Traders" and "Protectionists"—and "luke warm" politicians with no policy at all—have been writing and speaking their views and I have endeavored to summarise them. Now I give the case for the Paper Makers. It states, *inter alia*:—"There are 53,000 workers employed in the papermaking industry of Great Britain and Ireland. According to the latest figures supplied by the unemployment Department of the Ministry of Labor, covering the week ending April 15th, 1921 (before the effects of the coal strike were felt) 24,455 employees were in receipt of unemployment benefit. Up to the end of September 1920, the paper mills operated to full capacity, and from the termination of the war till that time the prices of foreign papers were generally higher than the prices of the home manufactured article. The collapse of the oversea market towards the end of 1920 forced continental producers to send their surplus tonnage to their open market—Great Britain—and quotations were given and paper was sold in this country at far below the cost of manufacture in British mills, which resulted in most cases in curtailing the operations and in some cases in the complete stoppage of home mills. The foreign producer is able to undersell British mills at a profit to himself, owing to heavily depreciated currencies, viz:—Price per ton delivered in Great Britain in 1914: Finland £9 12s. 6d. was equal to 230 Marks; Germany, £9. 18s. 4d. was equal to 200 marks. In 1921: Finland, £25 10s is now equal to 4,600 marks; Germany, £25 is now equal to 6,600 marks. Depreciated currency allows foreign mills to obtain 20 to 33 times their pre-war price, cutting British makers by 25 per cent. It is obvious that no British producer can meet competition of this kind and that some immediate corrective for the collapsed exchange is absolutely necessary."

What a Subsidy Can Do!

The statement next goes on to deal with pulp wood and Canada is selected for comparison. It says: "From the best information available to the British trade today, the cost of producing newsprint paper in Finland is 2,300 Finnish Marks per ton. The cost of producing similar paper in Germany 2,400 Marks per ton. The German mills have been subsidised by the German Government as to their chief raw materials, wood being supplied at a price of one-fourth of that prevailing in Sweden, Norway, America or Canada. The coal for the German mills is also supplied at a figure far below the economic cost of production. Skilled labor in Finland on their present scale is equivalent to 18 shillings per week ($4), in Germany to 14 shillings; in Austria to 6 shillings, per week and in Belgium to 32 shilings per week, roughly. Similar labor in British mills is paid from £5 10s. to £6 10s. per week.

The paper mills in Great Britain and Ireland, working full capacity, are capable of producing 1,200,000 tons per annum. Of this total, the capacity for newsprint paper amounts to 450,000 tons per annum. The present consumption of newsprint paper in Great Britain is less than the amount which could be produced by British mills alone, so that there is no necessity for importing this grade of paper from foreign mills. Since the beginning of this year the importation of newsprint from abroad has steadily increased month by month, so that the figure of importation for the last month available is more than double that of the first month of the year. In addition to present importations of this class of paper alone, which exceeds 2,000 tons per week, the British industry is aware of large contracts recently placed with continental supplies, which, if executed will entirely submerge the industry of manufacturing newsprint in this country; now, under the existing circumstances, can the British hills hope to gain from any general revival in trade in Great Britain, for the business will go to the foreign producers who are (helped by their depreciated currency) able to quote lower prices."

A Remedy Suggested.

Dealing with the export trade the British Paper Makers say that prior to the war it was considerable and in 1913, 174,945 tons of all kinds were exported. "Leaving out the period of the war", they go on to say, "when export trade was difficult, the British papermaker was only just beginning to get back his export trade in 1920 (total for that year 117,621 tons), when the slump produced by the inroads of foreign paper upon the British market reduced the production of the British mills to such an extent as to seriously increase his cost of production, thus adversely affecting his price for export, with the result that only 23,094 tons of British paper was exported in the first three months of this year. If it is possible by regulating the exchanges to bring the home trade back to British mills, it will again be possible for them to compete in the export markets of the world.

The point has been raised by newspaper publishers that British paper mills are unable to compete with the foreigner owing to their having large stocks and contracted for further stocks of their chief raw material—wood pulp—at prices current during 1920. The answer to this is that the British paper industry protected itself for its raw material for the usual period in advance,

and only for the usual period. At the same time, it must be stated in fairness that the British mill owners are perfectly willing to write down these stocks of pulp to the present replacement values, assuming the loss thereby incurred, and as evidence of this willingness they have this week reduced their prices of newsprint from 4d. (8 cents), to 3½d. (7 cents) per lb. and if they can obtain orders which will enable them to run their mills at anything like full capacity, they will be able to still further reduce their price.

It should be particularly noted that all the Paper Makers ask for is that they should be treated under the second part of the Bill, relating to depreciated exchanges, in exactly the same way as other trades who have suffered, and to be allowed to place their case before the Committee of the Board of Trade."

This statement submitted for members of Parliament and others on behalf of the British Paper maker is a very fair one. Facts are given and it reflects great credit on them the way the position has been placed on paper. The consumer, of course, does not care one iota about British papermaking, so long as he can get a cheap raw material, and beyond this his interest in papermaking ends.

The Miners Strike.

It is regrettable to have to state that the strike of coal miners is not yet settled. Industry of all kinds is gradually coming to a standstill and the unemployment roll swells every day. Today I was speaking to a Government official who has just returned from an inspection in South Wales. He says the miners are idle, standing about with their hands in their pockets, there is no sign of hunger and everything pointed to the fact that the dispute might last another two months—unless something unforseen happens. The position today is really serious for paper mills.

Pulp Market.

The pulp market continues dull and lifeless. Prices, however, are unchanged. With the present condition of the paper industry and a serious coal miners srike in existence one must naturally expect a great depression in pulp buying.

Among the Scottish paper mills closed down are the Caldercruix & Moffat paper mills (Messrs. R. Craig & Sons, Ltd.), and the Culter Paper Mills, Deeside, Aberdeen, which employs about 700 people. These mills are closed until the coal miner's strike is ended.

P.R. WILSON WINS ARCHITECTURAL HONORS.

An item in a Montreal paper a few days ago which caught the attention of the editor stated that P. R. Wilson, of Sault Ste. Marie, was one of the seventeen out of 160 competitors from all over Canada whose design for Canadian Battlefields Memorial to be placed on the fields of France had been accepted by the committee. We find that Mr. Wilson, who is 21 years old, is the oldest son of Mr. Percy B. Wilson, President of the Canadian Pulp and Paper Association. He is in his second year in Architecture at McGill University, and his success in this competition indicates ability of no common order and gives promise of a successful career in his chosen profession. He is now engaged upon the preparation of the model of his design which is to be submitted for further consideration to the Commission appointed to deal with the matter. We are sure that the industry will be pleased to hear of this honor that thus falls on the house of the president.

CONSUMPTION OF PAPER IN THE UNITED STATES—1920.

The following table, which gives the consumption of various grades of paper in the United States in 1920 is taken from the April Bulletin of the News Print Service Bureau.

Grade	Mill Stocks Jan. 1 1920	Production 1920	Imports 1920	Exports 1920	Mill Stocks Dec. 31 1920	Quantity Available for Consumption
Board	40,329	2,313,449	*	*	53,104	2,300,674
Newsprint	15,369	1,511,968	729,869	45,976	24,763	2,186,467
Book	23,279	1,104,464	2,170	47,845	25,005	1,057,063
Wrapping	26,271	831,889	2,471	30,632	35,800	794,719
Fine	31,516	389,322	*	*	30,312	390,526
Felts, etc	5,315	366,941	*	*	13,420	358,836
Bag	2,087	211,923	*	*	3,031	210,979
Tissue	5,697	177,447	*	*	8,774	174,370
Hanging	1,452	113,824	*	*	3,027	112,249
Other	12,482	313,387	‡25,000	‡140,000	17,160	193,709
Total	164,317	7,334,614	759,510	264,453	214,396	7,779,592

* Not separately reported. ‡ Estimated.

TO MAKE LEATHER BOARD.

The Rumford Pulp Products Company, it is reported from Boston, has secured the old magnesia mill in Rumford, are remodeling it and installing the machinery necessary for the manufacture of a certain type of leatherboard which is used for innersoles and counters on some grades of shoes. For many years the gigantic plant of the Oxford Paper Company in Rumford has been producing a form of pulp from the knots and ends of logs consumed in their pulp mills. This material could not be used in the production of the good grades of book paper which the Oxford Company specializes in. The inferior pulp in question has been shipped out of the State in the past and used for some wrapping paper and bag paper mills. Now it will be used by the leatherboard company.

A RAPID METHOD OF DETERMINING MOISTURE CONTENT OF WOOD.

A method used by the Forest Products Laboratory for determining the amount of moisture in chips and sample borings from large peices of wood requires little equipment and only a few minutes time. The moisture content of pulpwood chips can be found by this method in from 7 to 10 minutes.

A specified weight of wood chips, usually 100 grams, is immersed in kerosene in a flask or retort, and the mixture is heated. The water in the chips changes to steam at 212 degrees, and goes out through a glass tube in the cork of the flask, is condensed by a water jacket surrounding the tube, and caught in a measuring glass. The boiling point of kerosene being higher than that of water, all the moisture will be driven off the chips before the oil vaporizes to any great extent. The oil that does go off in the form of vapor is condensed and caught in the same graduate with the water. When the evaporation of moisture is complete, the oil and water are allowed to remain a few minutes until the water has all settled to the bottom of the graduate. The amount of moisture in the wood chips is then found by a direct reading.

This method has been checked for accuracy with the method of weighing samples before and after oven drying, and the variation found to be less than 1 per cent.

The question for each man to settle is not what he would do if he had means, time, influence, and educational advantages; but what he will do with the things he has.—Hamilton Wright Mabie.

UNITED STATES NOTES

Judson G. Rosebush, president of the Patten Paper Company, Appleton Wis., and several Green Bay capitalists have subscribed $500,000 new capital in a reorganization which greatly strengthens the Northern Paper Mill Mills at Green Bay. The new interests entering the big Fox River Valey concern are paper men of wide experience.

Following a conference held between mill officials and union representatives last Thursday, it was announced that a settlement had been effected, ending the strike which was called some weeks ago by the 500 employes of the Northern Paper Mills. The men agreed to accept a wage cut of 16 2-3 per cent. Riots and disturbances, occasioned by interference with strike-breakers on the part of pickets, had led to a call for troops being made to Governor Blair of Wisconsin Thursday morning, but the latter was not required to act when the strike suddenly terminated after the conference Thursday night. The request for troops was made after Sheriff Nicholas Ryan of Brown county and a force of armed deputies were overpowered at the gates of the mill in Green Bay. By the terms of the settlement no person in the employ of the mill Saturday, May 28, will be displaced to make room for a striker. This means that about 200 men, former employes and strike-breakers, who have continued working, will keep their jobs and that an equal number who struck will be without jobs. This is about one-third of the total number of employees. The mill remains an open shop plant and the settlement provides that there shall be no prejudice toward union or non-union men in employment, on pain of dismissal. The settlement marks also the termination of all labor troubles in the Fox River Valley paper industry. Most of the mills in adjoining cities accepted reductions without resistance.

The Charles Boldt Paper Mills Company of Cincinnati, Ohio, has just completed a $1,000,000 plant at New Iberia, Louisiana, for the manufacture of paper board from rice straw. The product will be sold in rolls of 1400 pounds to box manufacturers.

The paper hat for women who like to change the style of their headgear frequently has reached Chicago from Paris to be studied. It will be tested by Gage Bros. who are contemplating ordering a supply of them with a view to bringing down the high cost of millinery. The sample which has been received seems to dispel all doubts entertained by milliners, who when they thought of paper hats saw visions of three-cornered contrivances constructed out of newspapers for the pacification of troublesome children. But the Parisian hat is so well contrived that it scarcely can be distinguished from those of straw and cloth. It is claimed that the paper chapeaux can be made to sell for such a low price that women will go shopping for a new one every week or two.

No progress was made of efforts to settle the strike of 40,000 paper workers in the United State and Canada at conferences held all last week at Albany, N.Y. between representatives of the unions and manufacturers. Adjournment was taken last Friday after it was found impossible to get laborers employed in the paper mills to accept a reduction in the present 54 cents an hour scale. Wood choppers, wood pilers and truckmen come under the head of common labor, and their representatives controlled the union delegates. The representatives of the companies said that 54 cents an hour was out of proportion to the scale paid to skilled men, such as machinists, who get 66 cents an hour. It is understood that the companies would have agreed to a continuance of the eight-hour day, but refused to continue the conferences when they could get no compromise on the common labor wage scale. Officers of the union were authorized to reopen negotiations with the companies, which may be done this week.

About 300 paper mill men from all parts of the country attended the annual convention of the American Pulp and Paper Mill Superintendents' Association at the Waldorf-Astoria Hotel, New York last Friday and Saturday. F. C. Boyce, of Wausau, Wis., president of the association, predicted in his annual address that peace is near in the paper and pulp industry. "The two great problems that confront the paper industry," said Mr. Boyce, "are wood for the manufacture of paper and labor. The mills are stocked with high-priced wood. The labor problem has not been entirely adjusted but I am sure that when the employes realize that there must be a wage readjustment this will all straighten itself out." Delegates maintained that wage readjustments must be made if the industry was to avoid receiverships.

Sidney D. Wells, who has charge of the United States Products Laboratory, at Madison, Wis., spoke to the paper mill superintendents, saying that he expects soon to bring down to a commercial basis a process for bleaching Southern pine pulp to permit of its use in high grade papers. At present the Southern product is used mainly for brown kraft paper. When this process will be utilized, Mr. Wells said, a great quantity of pulp from other sections of the country can be turned to the manufacture of newsprint. Southern pine grows two or three times faster than the Northern tree, he said, so that with proper reforestation a great increase in the pulp supply will be available. No more than 33 per cent of the forests East of the Rockies are available for pulp now, and from this 87 per cent of the entire supply must come.

Announcement was made at the superintendents' convention that the International Paper Company had just laid before its employees a proposed wage schedule and open shop agreement by which it is intended to stand in the settlement of wage troubles. The company's plants have been idle since May 1, when the workers went on strike in the walkout affecting about a score of large manufacturing establishments in the United States and Canada. Attempts at arbitration having failed, the company offers the same pay rates as were effective in 1919, with some exceptions, and proposes methods of settlement of future disputes. Operation of the mills would be resumed, it was stated, as soon as enough employes report for work. The company offers to take back former employes without prejudice, provided they have not been convicted of offences against the company during the strike. It declares for an eight hour day, "mutual bargaining between the company and its employees," and will permit employees to belong to labor unions.

Technical Section

A-1. Paper from Veneer Waste. Chem. Met. Eng., xxiii, 1080 (Dec. 1, 1920). From **Technical Notes,** Forest Products Laboratory, Madison, Wis. Raw material suitable for the manufacture of high grades of paper is found in wood wastes from veneer factories. The cores of many kinds of veneer logs, now used in large part for fuel, would make excellent pulpwood. In addition, a large part of the clippings and small veneer waste probably could be turned into pulp stock with profit. Among the veneer woods whose waste has papermaking possibilities are red gum, yellow poplar, cottonwood, birch, tupelo, basswood and beech.—A.P.-C.

A-3. Cryptogamous and Aquatic Plants for Papermaking. CH. GROUD. **Papier,** xxiii, 259-63 (Nov. 1920). A description of various cryptogamous and aquatic plants from the point of view of their utilization for papermaking. The Pisan marshes contain a large variety of plants, the ensemble of which is known locally as "falasco." Part of it is used for the manufacture of mats, cordage, baskets, wicker work, etc. Experiments were carried out on several of the species to determine the yields of pulp. The plants were cut, cooked with 6 per cent caustic soda under three atmospheres pressure for three hours, washed, bleached with 10 per cent of bleaching powder, pressed and dried. The following yields were obtained: Carex paludesa, 43 per cent; Phragmites communis, 47.5 per cent; scirpus lacustris, 45.5; Thypha angustifolia, 44 per cent; Cyperus longus, 25 per cent. The bleaching of the fibres by sulphur dioxide and by potassium permanganate was no more satisfactory than with bleaching powder. The species which predominate in "falasco" yield long regular fibers, which could be easily utilized.—A.P.-C.

A-6. Gas Analysis by Absorption and Titration. R. S. TOUR. **Chem. Met. Eng.,** xxiii, 1104-6 (Dec. 8, 1920). Description of a gas volume compensometer for measuring residual gas volume in the method of gas analysis by absorption and titration, and of a nomography, or alignment chart, for simplifying the calculations of results.—A.P.-C.

A-12. Technical Casein. J. Ind. & Eng. Chem., xii, 1162-73 (Dec. 1920). **I. Introduction,** W. MANSFIELD CLARK. A description of the purpose and scope of the investigation. II. **Grain-curd casein.** W. MANSFIELD CLARK, H. F. ZOLLNER, A. O. BAHLBERG, and A. C. WEIMAR. To meet the demand for the high grade of commercial casein required for the manufacture of glue to be used in the construction of aircraft, a controlled method of manufacture was devised and put into large-scale operation. This method was based primarily upon the properties of casein as an amphoteric electrolyte, the chief control being exercised through the control of the positive hydrogen ion concentration at which the casein is precipitated and at which the casein is washed. The casein so produced met the requirements of the government specifications, gave promise of being suitable for the manufacture of high-grade glue, and possessed uniformity in physical characteristics which doubtless would have eliminated the necessity for troublesome changes in glue formulas. An outline of the theoretical aspects, details of manufacture, and studies of the effects of washing and exposures to atmospheres of different moisture contents are reported. III. **Methods of analysis.** ROSCOE H. SHAW. A critical survey of the methods of determining moisture, ash, fat, sugar, phosphorus, and lime. For reliable results for moisture, the standard method of drying to constant weight in a partial vacuum at the temperature of boiling water should be used. In the case of low ash caseins an added base is required if accurate results are to be obtained. This is not necessary in medium—and high—ash caseins. This is due to the low lime content of low-ash caseins which results in loss of phosphorus, the amount of less depending on the temperature of ignition. The results obtained by extracting the fat with ether depend on the degree of fineness of the sample, as the grains of casein are hard and not easily penetrated by the solvent. A modification of the Roese-Gottlieb method has been devised which gives accurate results because the sample is dissolved and consequently none of the fat escapes the action of the solvent. Sugar was determined by adapting the method for determining sugar in cattle food (method of Bryan, Given and Straughn, U.S. Dept of. Agriculture, Bureau of Chemistry, Circular lxxi, 1911). The finer the size of the casein granules, the greater the amount of sugar obtained. The most satisfactory method for the determination of phosphorus was the official method for determining total phosphorus in fertilizers, using method (a)2 for oxidizing and getting the casein into solution (see Official and Provisional Methods of Analysis, 1908, U.S. Dept. of Agriculture, Bureau of Chemistry, Bull. 107, revised). The determination of lime offers no difficulty as all of it is found in the ash after ignition. IV. **Standardization of the borax solubility tests for commercial caseins.** HARPER F. ZOLLER. The viscosity curve of casein borax solutions shows that the maximum viscosity if obtained at a H ion concentration of pH 8.15, while a pH of 8. 9-9.1 the viscosity is less but constant, owing to the buffer effect of borax in the region. The importance of conducting the borax test in this buffeted region is discussed. The great variation in the viscosity of casein solutions at different concentrations of casein is utilized in the physical test by choosing a concentration which will bring out the difference in physical constitution of casein prepared under safe and dangerous conditions of temperature. The viscosities of several caseins in borax solution are given to show that difference in physical structure of casein have greater influence upon their viscosity than the normal contaminating substances present in commercial casein. High-temperature caseins always exhibit a comparatively great initial viscosity. The revised method for the borax test is as follows: The casein is ground to pass a 40-mesh sieve; 15 g. of the casein are measured into a 250 Cc. beaker; 100 Cc. of 0.2M borax at 30° Cent. (76.32 g. of $Na_2B_4O_7.OH_2O$ diluted to 1 liter) are aded with vigorous stirring. This is allowed to stand for thirty minutes with thorough stirring at intervals of five minutes. During the first five minutes the

mixture should be stirred rather frequently. A casein of known purity and conduct should be used as control until thorough familiarity with the method is gained. Usually the character of the casein shows up within the first ten minutes, but thirty minutes is advised for safety. Longer periods are unsatisfactory because of the improved casein-borax test includes low solution difficulty in interpretation. The essential changes in temperatures, reduced concentration of casein, and increased concentration of borax. These changes are based on purely physicochemical relationships. The value of the casein-borax test is defined as an accurate means of differentiating between low-and high-temperature caseins.—A.P.-C.

A-14. Measuring the Translucency and Opacity of Paper. RAYMOND FOURNIER. **Papier,** xxiii, 259-7 (Nov. 1920). In Klemm's apparatus for measuring the capacity of paper, the personal equation plays a great part. F. proposes a modification of this apparatus wherein the eye of the observer is replaced by a selenium plate (similar to those used in telephotography), which is connected to a source of current and to a galvanometer. By closing the circuit and noting the deflection of the galvanometer, first when there is no paper between the source of light and the selenium plate, and, second, when one or more sheets of the paper to be tested are interposed, the opacity of the latter can be easily and quickly determined.—A.P.-C.

A-14; 15. The Determination of Cellulose in Rubber Goods. S. W. EPSTEIN and R. C. MOORE. **India Rubber J.** xlix, No. 13, 21-8 (March 27,1920); **Chimie & Industrie,** iv, 660-1 (Nov. 1920). A sample weighing 0.5 Gm. is digested in a 250 Cc Flask with 25 Cc of freshly redistilled cresol (b.p. 198° Cent.) for four hours at 160 to 185°, cooled, diluted by the addition of 200 Cc of petroleum ether in small portions at a time with constant agitation. After separation of the layers, the liquid is filtered through a Gooch, washed five times with very hot benzene and one or twice with acetone. The residue in the flask is treated with hot 10 per cent hydrochloric acid and transferred to the Gooch. The addition of hydrochloric acid should be done cautiously to avoid loss of material in case carbonates are present. The residue in the Gooch is washed ten times with hydrochloric acid, then with boiling water until the wash waters no longer react acid, then with acetone until the washings are colorless; then with a mixture of equal parts of acetone and carbon disulphide until the filtrate is colorless; and finally with alcohol. The asbestos and precipitate are removed, dried, and weighed. The whole is digested for half an hour at 75° Cent. with 15 Cc of acetic anhydride and 0.5 Cc of concentrated sulphuric acid, cooled, diluted with 25 Cc of 90 percent acetic acid, filtered (without strong suction) on a tared Gooch, washed with 90 percent acetic acid until the filtrate is colorless, and then four times more; wash five times with acetone, dry for two hours at 150° Cent., cool, and weigh. The loss represents the amount of cellulose. The authors give numerous examples of results obtained with various classes of goods. The method is especially suited to the rapid determination of the tissue in waterproofed, rubberized, etc., fabrics. It is very accurate, especially in the case of regenerated rubbers. In mixtures containing wood, jute, cork and leather, it is preferable to digest for sixteen hours at 120° Cent. in cresol. By acetylation 95 percent of the wood, 90 percent of the jute, 21 percent of the cork, and 70 percent of the leather present is obtained.

The non-acetylated cork may be separated and considered as at 70 percent of that originally present. In the absence of wood, jute, and cord, leather can be determined approximately.—A. P.-C.

A-16. Acid-resisting Alloy. U. S. Patent No. 1,354,-988, assigned to FOSTER MILLIKEN, Lawrence, N.Y., S. FULLERTON WEAVER and JAMES M. REPPLIER as trustees Oct. 5, 1920. **Chem. Met. Eng.,** xxiii, 988 (Nov. 17, 1920). An alloy to resist high temperatures and the action of acids, alkalis, and chemical mixtures at high temperatures, consisting of copper, 50 to 60 per cent; nickel, 28 to 36 per cent; zinc, 4 to 8 per cent; and iron, 4 to 8 percent.—A. P.-C.

A-9. Active or Available Chlorine. J. R. MACMILLAN, **Chem. Met. Eng.,** xxiii, 1064 (Dec. 1, 1920). The term "active" or "available" chlorine is used to define the chlorine in bleaching powder which has oxidizing power, to distingush this from the chlorine which is present as chlorides or chlorates. It is the usual practice in routine analysis of bleaching powder to determine the active chlorine and also the total chlorine present. The difference in percentage between the active and total chlorine is called chloride chlorine or inert chlorine. When bleaching powder is dissolved the term "active" chlorine becomes somewhat a misnomer, as the active principle then is the oxygen in the calcium hypochlorite, the results, if this is understood, are expressed correctly either in terms of chlorine or of oxygen. The same is true when chlorine is absorbed in alkaline solutions or in milk of lime. If conditions as to temperature and distribution of gas are properly maintained, all the chlorine absorbed will be indicated by analysis to be "active," although only half of it will be present in the hypochlorite formed. Thus a pound of chlorine gas is equivalent to a pound of active chlorine in bleaching powder. If some of the chlorine present in the form of chloride can be removed from the solution, then it is possible to get an analytical result showing a higher percentage of "active" chlorine than the percentage of total chlorine present. This is possibue because the oxidizing power of the solution is really what is determined, although it is expressed in terms of chlorine.—A.P.-C.

B-1. Disease of Spruce (Picea excelsa). Compt. rend.; Bull. Synd. Fab. Papier et Carton. xxiii, 362-3 (Dec. 15, 1920). Description of cankerous growth which was noted on young spruce (picea excelsa) in the forest of Barèges, about 1,500 to 1,700 meters above sea-level, and which appeared to have been due to the presence of cankered pines. The growths are of a bacterial nature.—A.P.-C.

B-9. Canada's Pulpwood Laws and Regulations. Chem. Met. Eng., xxiii, 1056 (Dec. 1, 1920). Brief extracts from the Quebec regulations concerning the cutting of timber on crown lands.—A.P.-C.

B-0. Sodium Fluoride as Wood Preservative. GEORGE M. HUNT. **Chem. Met. Eng.,** xxiii, 1123-4 (Dec. 8, 1920). A discussion of the relative merits of sodium fluoride and zinc chloride as wood preservatives, showing that the matter is practically one of price.—A. P.-C.

E-4. Gas-scrubbing Towers with Internal Packing. F. G. DONNAN and IRVINE MASSON. **J. Soc. Chem. Ind.,** xxxix, 236-41T (July 31, 1920). A mathematical discussion of the theory of gas-scrubbing towers with internal packing with a view to obtaining as simply as possible mathematical expressions which might serve

(Continued on page 622.)

PULP AND PAPER NEWS

Mr. Frank B. Holt, who has been at Grand'Mere since last October in connection with the installation of the Harland Patent Interlock Electric Drive on Laurentide's No. 8 and 9 machines has returned to England. Mr. Holt leaves many friends at Grand'Mere where he entered heartily into the activities of the community.

Mr. Harry Bates, who during the construction of the new Laurentide machines, was their representative engineer at the Dominion Engineering Works has returned to Grand'Mere. He is now connected with the welfare and employment work.

Recent visitors at Grand'Mere were Mr. T. Ramsen and J. White of the International Paper Company's new mill at Three Rivers.

The commencing exercises of the Laurentide night school were held recently and certificates presented to eleven young people who had made satisfactory records. Mr. Ellwood Wilson, Director of the school, presided and gave a brief talk on the development and advantages of the night school. Prizes were awarded for the best records and those who had an attendance record of 95 per cent or better received back half their tuition money as their reward.

A new club in the St. Maurice Baseball League is represented by the team of the International Paper Co. This league has been running for a number of years and has provided a lot of good healthy sport.

We notice that The Digester published by the Laurentide Co., is now including in its weekly isues a health bulletin which is provided by the Laurentide contract with the Metropolitan Life Insurance Co., for group insurance. This particular bulletin brings home to the workers the dangers due to the ordinary house fly. As it is printed in both French and English and forcefully illustrated, it should certainly be helpful and instructive.

The Vocational courses at Iroquois Falls have been completed and have been an unqualified success. The courses on Acid Making and Wood Technology were completed and the course on Groundwood is to be continued in the fall when additional courses such as Paper Making and Steam Plant Operation will be added to the list. One of the encouraging features of the work has been the attendance at lectures by men working in other departments.

From the personal column in the Broke Hustler it would appear that nearly everybody in Iroquois Falls has either just returned from a vacation, is contemplating one shortly, or is enjoying one at present.

The Associated Boards of Trade of Ontario will leave Sunday for a rather extensive trip through the Province. A number of pulp and paper plants are included in the itinerary. These are the Spanish River Pulp and Paper Mills at Sturgeon Falls, the Abitibi Mills at Iroqois Falls, the Mattagami at Smooth Rock Falls and the Spruce Falls Pulp and Paper Company's new mill at Kapuskasing.

The kids at Iroquois Falls will not have the usual conception of a policeman the small boy usually has. Chief Morbey has just sent the boys a bat, ball and an infield glove. In order to keep peace in the family he has also sent a bat and ball for indoor baseball to the girls. The children will no doubt realize now that they have a good friend in the chief.

The Spanish River News is getting out some very attractive issues of their interesting paper.

The Mead Sales Co., has been organized as an Ohio concern for the sale of all grades of paper except newsprint. The personnel will consist of the pulp department of the G.H. Mead Co., and that company will hereafter confine its activities to the sale of newsprint.

A recent visitor at the Spanish River Mills at the Sault was Mr. G. D. Kilmaster, who has just returned from Newcastle, New South Wales, where for the past eight years he has been the United States Consul.

Mr. George Bearce of the Newsprint Service Bureau, New York, was a recent visitor at the Sturgeon Falls and Soo mills of the Spanish River Pulp & Paper Mills.

The Spanish River News for May 28th pays special attention to the Woods Department. There are a number of interesting articles on phases of the lumbermen's life and some good illustrations.

Football and baseball have started in earnest with the Spanish River employees as we find notes of their activities at both the Soo and Espanola. We find also that lacrosse and cricket are not overlooked. There must be at least one Englishman on the cricket team as we notice the name of P. B. Wilson, which we take to represent the President of the Pulp and Paper Association.

According to the Digester, the new Laurentide machines are beginning to show what they can do. An average of practically 140 tons from the pair have been maintained for the three days reported upon in detail. We understand that the output has since been maintained at only slightly less than the estimated production.

Shawinigan Falls and Grand'Mere each sport two tennis teams. Shawinigan B team beat the Grand'Mere B's at the Falls while Grand'Mere A team was victorious on their home court.

Mr. B. Hart of the New York Times was a recent visitor of the Laurentide Co., at Grand'Mere.

Duncan B. MacDonald, C.A., aged 48, partner in the firm of Oscar Hudson & Co., died at the Western Hospital, Toronto, after a short illness from cancer. Born in Glengarry, Ont., for several years he was accountant with the Spanish River Pulp and Paper Mills. Nine years ago he came to Toronto.

FRASER COMPANIES RESUME WORK.

Edmunston, June 6.—All the pulp plants and lumber mills of the Fraser Companies, Limited, in New Brunswick and Quebec will be in operation at full capacity this week, according to an announcement by Donald Fraser. Orders of sufficient size, although at greatly reduced prices, have been obtained to warrant the starting of the machinery in full capacity.

The companies operate the new sulphite mill at Edmundston, N.B. and the former Dominion Pulp Company's plant at Chatham, N.B.

CANADA PAPERBOARD'S WAREHOUSE BURNED.

Fire of undetermined origin, Saturday night, destroyed several thousand bales of paper stock and a large warehouse owned by the Canadian Paperboard Company, Limited, corner of William and Seigneurs streets, Montreal. Although the blaze was of short duration, the flames were so fierce at the beginning that surrounding plants and residences were threatened with destruction. Prompt work by he firemen, however, confined the fire to the warehouse, which collapsed in a short time, portions of walls falling on electric wiring and causing vivid fireworks.

The fire was discovered by a night watchman of the plant, while on his round. When he opened the door of the warehouse the flames were sweeping through the place and he immediately turned in an alarm.

The flames were fanned against the manufacturing plant of the paperboard company across the lane, and also threatened the Ogilvie Floor Mills Company's plant.

Men were kept on the spot watering the ruins all night and throughout Sunday. The debris was cleared



D. F. ROBERTSON,
General Manager Canadian Paperboard Co.
(Photo, courtesy International News Service.)

off William street and off Seigneurs street to allow the passing of the trams of the Guy street line.

An estimate of the loss was made at $50,000 for the building and $15,000 for the stock by David F. Robertson, general manager of the Canadian Paperboard Company, Limited, last night. Mr. Robertson stated that the stock of raw material would not interfere in any way with the continuance of their operations, as they had other factories at Frankford and Cambellford, Ontario, which can supply them. Plans will be made for an immediate reconstruction of the building. Mr. Robertson added that the firemen did excellent work in confining the fire to the warehouse, especially owing to the congested area in which it was situated.

REDUCTION IN NEWSPRINT PRICE.

It was stated this week by an official of the Canadian Export Paper Company, Limited, that a decrease in the price of newsprint to 4¾ cents per pound or $95 per ton. has been decided upon. The new price which will be effective for the quarter beginning July 1st, means a reduction of $15 per ton. The company handles the product of Price Brothers, Laurentide, St. Maurice, Belgo-Canadian and Brompton.

It is also understood that the George H. Mead Company, of Dayton, Ohio, has decided upon a similar reduction. The latter company handles the newsprint of the Spanish River and Abitibi mills.

ANOTHER PAPER MILL FOR MANITOBA.

Ottawa, June 2.—A pulp concession which has just ben granted by the Government to J. D. McArthur, of Winnipeg, is expected to obviate a recurrence of the dearth of newsprint supply in the prairie provinces.

The concession consists of 718 square miles of pulp and timber land east of and adjacent to Lake Winnipeg. Mr. McArthur is to construct a pulp and paper mill costing at least one million dollars, to be completed within three years. It is to have a capacity of one hundred tons a day. Not less than fifty per cent of the pulp is to be manufactured into paper at the mill. The balance may be disposed of otherwise, except that, if in the opinion of the Minister of the Interior, it is required for the domestic market in Manitoba, Saskatchewan and Alberta. If it is export will be banned.

The grant also involves timber apart from pulp wood. The concessionaire intends to start work as soon as possible and give employment to several hundred.

J. M. IMRIE FOR EDMONTON JOURNAL.

The Edmonton Journal announces the appointment of John M. Imrie as managing director of that newspaper in succession to the late M. R. Jennings; also the election to its board of directors of Charles R. Morrison and Arthur Yockney, who have been on the staff for many years as managing editor and business manager respectively. Mr. Imrie, whose appointment takes effect July 1, has had a wide experience in newspaper work. He was manager first of the Canadian Press Association and later of the Canadian Daily Newspaper Association. Recently he has been a member of the head office staff of William Southam and Sons, Limited, doing special work of an executive character for various newspapers that company is interested in.

G. R .GRAY CARRIES WIRELESS EQUIPMENT.

Built at a cost of $200,000, the tug G. R. Gray, with engines and boilers of the most modern type, and carrying wireless equipment, has been turned over to her owners, the Spanish River Pulp & Paper Company. The vessel, which is 151 feet over all, 24 feet beam, 14 feet moulded depth, was built by the Toronto Dry Dock Company. Captain T. I Ganley is in command of the tug, and at the "Soo" he will turn it over to Captain J. L. Ramsay.

The G. R. Gray is named after the manager of the wood department of the Spanish River Company. It will be used in towing pulpwood to the Company's mills.

Can you sleep standing up? Then tell the Secretary, at once, to reserve accommodation for you on the T. S. trip.

(Continued from page 619.)

as the preliminary basis for the experimental study of the factors which govern the design and operation of internally packed gas-scrubbing towers. The equations which are reduced show in a quantitative manner of how a high absorption efficiency depends on: (1) High interfacial area between gas and liquid. (2) High relative motion between gas and liquid (within limits). (3) High degree of turbulent motion in one or more phases. (4) Sufficient rate of flooding to secure the maximum drip effect.—A. P.-C.

E-4. Gas-Scrubbing Towers with Internal Packing. W. B. VAN ARSDEL. **Chem. Met. Eng.,** xxiii, 1115-6 (Dec. 8, 1920). (See also previous abstract). Attention is drawn to the similarity between internally packed gas-scrubbing towers and heat interchangers, and to the simplification in the mathematical treatment of the problem by the use of heat interchanger formulas.—A. P.-C.

H-4. Chemical Efficiency and Concentration of Caustic and Salt from Townsend Cells. ALBERT H. HOOKER, **Chem. Met. Eng.,** xxiii, 961-8 (Nov. 17, 1920). The Townsend cell installation of the Hooker Electrochemical Company, Niagara Falls, is briefly described, and nine charts are given and explained which illustrate (1) specific gravity and grams per liter of saturated NaCl—NaOH solutions (giving also Engel's and Winteler's values); (2) per cent by weight and grams per liter of saturated NaCl—NaOH solutions; (3) specific gravity at 20° Cent. and 100° Cent. of NaCl—NaOH solutions; (4) specific gravity of NaOH and NaCl—NaOH solutions; (5) specific gravity of NaCl solutions; (6) solubility of Cl in brine and water; (7) water and salt ratios to NaOH chemical efficiencies; (8) concentration of NaCl in NaOH solutions; (9) per cent NaCl and NaOH during concentration.—A.P.-C.

H-4. Fundamentals of the Electrolytic Diaphragm Cell. HUGH KELSEA MOORE, **Chem. Met. Eng.,** 1001-5 (Nov. 24, 1920); 1072-4 (Dec. 1, 1920); 1125-8 (Dec. 8, 1920). A discussion of the fundamental principles involved in the construction and operation of the unsubmerged diaphragm cell, as exemplified by the Allen-Moore cell, comprising a detailed study of brine composition and products resulting from its electrolytic decomposition in the cell, current decomposition and energy efficiencies, rate of flow, effect of washing diaphragm on voltage and current and decomposition efficiencies, importance of purifying the brine, causes of the variations in voltage in use, errors in the determination of current efficiencies and necessity of using average data, relation of brine concentration and temperature to voltage and amperage, cell lag and instant results, effect of small quantities of sodium sulphate in the salt fed to the cell on the carbon electrodes and on the production of chlorate in the cell; together with an appendix on the calculation of the decomposition voltage and the theoretical yield per ampre-hour of various elements, inorganic compounds, and organic compounds.—A.P.-C.

K-7. Determination of the Degree of Beating of Paper Pulp. ANON., **Papier,** xxiii, 255-6 (Nov. 1920). A description of the Schopper-Riegler apparatus for determining the degree of beating of pulp, and of the method of carrying out the test. A.P.-C.

K-12. New Type of Suction Box. Fr. patent no. 508,109, ERNEST LAMORT and MARCEL LAMORT, Grand-Duchy of Luxemburg. **Papeterie,** xlii, 1025-30 (Nov. 25, 1920). The suction-box is constituted by three rolls, two of which are tangent to the machine wire along their top elements, while the third is tangent to the other two. The latter is covered with rubber or the like, and travels at the same peripheral speed as the wire of the machine, thus driving the other two rolls at this same speed. The space between the three rolls and the wire constitutes the suction-box, the extremities of which are closed by a hydraulic joint of any known form. Just outside the deckle-straps are two endless rubber belts, each having a width at least equal to half the difference between the maximum and minimum widths of the sheet of paper that is to be made on the machine. The position of these belts is adjustable across the width of the machine, so that when the whole width of the machine is not being used they cover that part of the suction box which lies between the edge of the sheet and the edge of the wire. The advantages claimed for this style of suction-box are: as the rolls constituting the suction-box travel at the same speed as the wire there is no friction, and consequently there is less wear on the wire; the rubber belts do away with the use of plungers for adjusting the length of the suction-box to the width of the sheet being made.—A.P.-C.

K-12. The Pope Patent Paper Threader. Paper. xxvii 10 28-30 (Nov. 10, 1920). A detailed description of the patent (Dec. 4, 1917) which covers a device for automatically transferring (by means of air) the web of paper from the calenders to the reel, especially on fast machines.—A. P.-C.

K-12. Warner's Patent Consistency Regulator. Paper, xxvii, 10, 210 (Nov. 10, 1920). Brief description of a consistency regulator covered by U. S. Patent No. 1,225,086, May 8, 1917, and Can. patent No. 178,495, July 31, 1917.—A. P.-C.

K-12. Improvement to Driers. Fr. patent No. 507,-936, ERNEST FARRELL, England. **Papeterie,** xlii, 1073-7 Dec. 10, 1920). The patent covers a device for obviating the necessity of using fibrous packing material at the trunions of the drying cylinders. This is accomplished by using ball bearings at the end where the steam is admitted to the drier and roller bearings at the end where the water is evacuated, both ends being at the same time supported by ball and socket joints.—A. P.-C.

K-18. The Manufacture of Corrugated Paper Board. A. LAMBRETTE. **Papeterie,** xlii, 1014-8 (Nov. 25, 1920); 1058-65 (Dec. 10, 1920). A description of the equipment used for the manufacture of corrugated paper board.—A.P.-C.

L-4. Paper Barrels.—Fr. patent No. 506,383, MAXENCE ISNARD, France, (Isère), May 28, 1920. **Papier,** xxiii, 266 (Nov. 1920). A receptacle is made with its inside walls of the shape of the outside of the desired article, said walls being constituted by a fine wire gauze, or other material permeable to liquids. This receptacle is given a rapid rotary motion by its vertical axis, and one or more jets of paper pulp is directed horizontally against said receptacle. Owing to the combined action of centrifugal force and the pressure of the jet, the fibrous material is felted and thoroughly compacted. When a sufficient thickness of pulp has been deposited, the article thus prepared is removed and the top and bottom put in place. The shrinkage which occurs on drying firmly fixes the latter in place. A. P.-C.

L-5. Cellulose Acetates. J. O. ZDANOWICH, London, England. **J. Ind. & Eng. Chem.,** xii, 1173-4 (Dec. 1920). The author has devised a method of producing cellulose acetates (U.S. patent no. 1,347,801, July 27,

1920; Br. patent no. 139,232, Sept. 18, 1918) the characteristic feature of which consists in the substitution of organic acids, especially chloracetic acids, in the nascent state, for sulphuric acid by adding a halogen to the acetylating mixture.—A.P.-C.

L-7. Sewing or Basting Thread from Paper. Ger. patent No. 314,490. Vohwinkler Papieru. Salicyl-Pergamentpapier-Industrie, Vohwinkel, April 16, 1918. **J. Soc. Chem. Ind.,** 226A (March 31, 1920). Paper threads of suitable strength are impregnated with a mixture consisting of paraffin or stearine, linseed oil, mineral oil, and varnish, and afterwards drawn between corks to remove the excess.—A. P.-C.

L-7. Impregnation of Paper Thread or Fabric. Ger. patent No. 299,771, T. DITTMAN, Germany. **Chimie & Industrie,** iv, 234 (Aug. 1920). The impregnating medium consists of glue and of solutions or resins in water, prepared in the usual manner.—A. P.-C.

L-7. Aircraft Fabrics. Br. patent No. 142,615, 1919, VICKERS LTD., and Sir J. McKECHNIE, Westminster and A. RYAN, Oldham, Lancashire, July 7, 1920. **Chem. Met. Eng.,** xxiii, 587 (Sept. 22, 1920). A process for preparing impervious fabrics for airships consistin in treating a fabric of cotton or other fabric having cotton as its principal constituent by suitable chemical means to convert the cellulose partly or wholly into cellulose acetate, then treating with softening agents, such as triacetine or castor oil, and finally calendering. Any ordinary method of acetylation can be used. For example, the fabric is treated for several hours at a temperature below 50° Cent. with double its weight of a mixture consisting of 5 to 6 parts acetic anhydride, 4 to 5 parts glacial AcOH, and 1 part fused $ZnCl_2$. After treatment with the softening agent and calendering, the fabric may be coated with cellulose-acetate or like dope, and varnished.—A. P.-C.

L-7. Preventing Rusting of Metallic Threads of Reinforced Paper Thread. Ger patent No. 301,209. A. FUNKE, Germany. **Chimie & Industrie**, iv, 234 (Aug. 1920). The wire is covered with a waterproof substance or with strips of greased paper, and is then immediately surrounded by paper fibers.—A. P.-C.

L-7. Spinning, Washing, and Drying Viscose Thread. Br. patent No. 125,394, M. DENIS, Mons, Belgium, April 8, 1919. **J. Soc. Chem. Ind.,** xxxix, 103A (Feb. 16 1920). The viscose is fed through one of a pair of interchangeable filter boxes into a bent glass tube which delivers it to the squirting nozzle directed upwards. The coagulating liquid is contained in a vessel shaped like a test tube which can be adjusted vertically in any desired position to afford a suitable immersion of the nozzle in the bath. The coagulating liquid is continuously circulated through inlet and overflow pipes with flexible connections. The thread passes upwards out of the bath and is caught by hooks attached to an endless travelling metallic web, preferably of aluminum, on which it travels downwards in an inclined path. During its passage in contact with the web the thread is sprayed by various suitable liquids, e.g., a fixing and a washing liquid, which are collected in troughs arranged behind the wire-cloth support. At the bottom the thread is detached from the web by a jet of liquid directed through the latter in reverse direction and is passed through a drying chamber while supported by a similar web travelling upwards through a current of hot air.—A. P.-C.

L-7. Process for Softening Paper for Spinning. Paper Yarns, and Fabrics. Ger. patent No. 300,695, C. HASENBRING, Hamburg, Jan. 6, 1917. **J. Soc. Chem. Ind.,** xxxix, 103A (Feb. 16, 1920). The goods are treated with a relatively strong solution of calcium chloride and then rinsed in such a manner that the calcium chloride is not all rinsed out.—A. P.-C.

L-7. Process for Compacting Paper Yarn Fabrics. Ger. patent No. 301,361, F. RAWITSCHER, Berlin, May 3, 1917. **J. Soc. Chem. Ind.,** xxxix, 103A (Feb. 16, 1920). The finished fabric is subjected to a prolonged boiling treatment in order to convert its constituent yarns into a permanently swollen condition. —A. P.-C.

L-7. Dyeing Artificial Silk. LEONARD PHILIP WILSON and MARJORIE IMISON. **J. Soc. Chem. Ind.,** xxxix, 322-4 (Dec. 15, 1920). Only a limited number of direct cotton colors can be considered eminently suitable for use with viscose artificial silk from the point of view of giving even effects. The term "even" as appled to dyestuffs in this conection means the property of the dyestuff of giving an equal depth of color on artificial silk fibers of different affinities. A large number of dyes have been tested and, according to the degree of evenness which they show with fibers of known difference of affinities, when dyed under standard conditions, have been classified as "even," "moderately even," and "uneven." It has been found that evenness (at normal dyeing temperature, Cent.) varies inversely as the molecular weight of the dyestuff used; the arrangement of the groups in the molecule and their nature have, apparently, no real effect. Most basic colors can be made to give shades which show no signs of unevenness when used to dye artificial silks of very different affinities. In the case of mordanting with tannic acid and tartar emetic, the most even results are to be obtained by dyeing first in neutral dyebath, and then fixing in tannic acid and tartar emetic.—A.P.-C.

M-4. Ball Bearings in Paper Mills. World's Paper Trade Review, Jan. 7, 1921, lxxv, 1, p. 50. An article giving detailed description of the important advantages derived from using ball bearings on any type of machinery.—A. C.

M-0. Weir Measurement of Liquids. L. G. CHASE. **Chem. Met. Eng.,** xxiii, 1224-6 (Dec. 22, 1920). Brief discussion of the importance of weirs for measuring corrosive liquids and of the formula for the V-notch of weir, together with a description of the Lea recorder, which is a commercial type of V-notch meter. A. P.-C.

N-7. Utilization of Hydraulic Power in France. J. MICOL DE PORTEMONT. **Papier,** xxiii, 252-5 (Nov. 1920). A brief description of the very great progress accomplished in France during the last five years in the utilization of its hydraulic power. The various projects for the utilization of the Rhone as a source of power are briefly described, together with the construction of the hydro-electric power station of the Société Hydro-Electrique de Lyon at the Val-de-Fier. Mr. Bergeon, Director of the French School of Papermaking has perfected a system of electrically heated boilers. These have been constructed and installed at the Papeteries H. Freydet & Cie., Brignoud, Isère. They have a capacity of 5,000 hp., using 3-phase current at 6,500 volts, and giving steam under a pressure of 6kg. (about 80lb.), which is used in driers of four paper machines. The boilers actually use about 500-1,000 hp. during the daytime and 5,000 during the night. They can be brought up to the pressure in half an hour; but it is preferable to do so in three hours. —A.P.-C.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, June 4.—Whether due to anticipatory action in connection with the printers' strike which is now in Toronto and other places, or to a general reductions in stocks the jobbers are unable to say, but most of them report a good month's business and one that nearly equalled the lighter months of the paper boom period. Undoubtedly there was freer buying by the printing trade in preparation of the strike for there has been a big output of the printers' product during the month and something like a run took place on the jobbers' stocks in an effort to get the printing jobs out before the men quit work. This had the effect of considerable movement in all lines of paper and this, added to what appears to be a stabilizing of prices has given a distinctly better tone to the paper market than has existed in some months. No one is making any predictions as to what may happen but there is a pretty general opinion that as far as paper goes, most of the lines have about reached rock bottom although there may be a few fluctuations in some lines. No further reductions are looked for for some time — if they come at all — in the standard lines, such as book paper, bonds, ledgers, writing papers, etc. and it will surprise a good many in the trade if there are any price recessions in the near future in any line now that the newsprint price for this third quarter is announced. The feeling of optimism is more than pronounced now than at any time since the slump set in, despite the possible effect of the printers' strike on sales, the idea prevailing that the printers will not be out for any lengthy period. As indicating that the jobbing trade is up and doing it may be mentioned that one of the big Toronto distributing firms is about to launch a big direct mail advertising campaign to boost made-in-Canada papers and pointing out that there is no printing job in Canada today, however high-class, that cannot be turned out on Canadian-made paper equal in finish and quality to any of the imported product.

PULP—In connection with the pulp situation a big Toronto financial house points out that recent depression in domestic and export markets for all commodities has been reflected in some phases of the pulp situation also, particularly those grades of pulp and paper depending upon publishing and advertising for their markets. The general slowing up of business has reduced the volume of advertising as well as the circulation of periodicals and newspapers. It is pointed out, that throughout all this unsettled period, people must eat and wear something, making some business in staple commodities. This is reflected in the kraft pulp phase of the paper business. Kraft pulp is used in the manufacture of strong wrapping papers and shipping containers with the result that this phase of the pulp industry in Canada, although somewhat affected, has been more stable under the recent slowing up of business. The pendulum has swung past this lowest point and general, though perhaps not rapid, improvement is looked for in the kraft situation, which is a good barometer of general business. Some improvement in the pulp situation has been noted during the past ten days and while there have been comparatively few transactions the enquiries indicate that an era of better business is beginning to set in.

MANUFACTURED STATIONERY. — While the products of the manufactured stationery plants are being cautiously bought by jobbers and the consuming public there is a good demand for the standard lines and manufacturers are confident that the Fall will produce good business. Although there is a dullness in some lines the general tone of business is satisfactory considering the present state of the paper market and reports from the retail end of the trade indicate that while buying is light the business is in a fairly healthy condition.

RAG AND PAPER STOCKS. — Demand for new cotton cuttings continues limited, although enquiries from paper mills are slightly more active than a month ago. Very little actual business has been placed. In fact the purchasing agent of one of the largest concerns of new cotton cuttings states that he has bought practically nothing for the last few months except where cuttings have been offered at special prices, and even then only on very limited quantities. With the exception of roofing rags the market for old cotton rags remains dormant. There have been several fair sized orders placed for roofing stock during the past few days, and dealers who have been calling on roofing mills report that they are gradually becoming lower. They consider that some mills will endeavor to take advantage of the low prices before some of their competitors get into the market and try to cover before there is considerable buying. There is no doubt but that any strong buying movement by the mills will boost prices up a good deal above present levels as the collection of mixed rags is probably the lowest in the history of the industry.

PAPER STOCKS. — Newsblank, kraft cuttings and manila cuttings have been in good demand during the past few weeks, and there have been reports of orders taken at prices slightly larger than those quoted. Shavings are beginning to move in larger volume within the quoted prices. Newspapers continue soft with very little demand from consuming sources. There have been numerous enquiries for fairly large tonnages of mixed papers and there is no doubt that any considerable buying by the mills will force prices up sharply. The larger packers appreciated the condition that the board mills are in and realize that it is difficult for them to pay high prices for mixed papers, and sell chip board at the present quotations. Nevertheless there has been so much paper destroyed that even the larger dealers are having trouble in filling any decent sized orders.

The following prices for rags and waste papers are reported:—

	Per Cwt. f.o.b. Toronto.
No. 1 shirt cuttings	$8.50— 9.00
No. 1 unbleached cotton cuttings	5.50— 6.00
No. 1 fancy shirt cuttings	6.00— 6.50
No. 1 blue overall cuttings	5.50— 6.00
Bleached shoe clip	7.50— 8.00
White cotton hosiery cuttings	8.50— 9.00
Light colored hosiery cuttings	8.50— 9.00



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Telephone: Murray Hill 4246-47

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Telephone: Main 1770-71.

INQUIRIES SOLICITED:

New Light flannellette cuttings	8.00— 8.25
No. 2 white shirt cuttings	5.50— 6.00
City thirds and blues (repacked)	1.30— 1.40
Flocks and satinettes	.70— .80
Tailor rags	.60— .65
Gunny bagging	.80— .90
Manila rope	2.75— 3.00
No. 1 white envelope cuttings	2.50— 3.00
No. 1 soft white shavings	2.25— 2.50
White blanks	1.40— 1.50
Heavy ledger stock	1.50— 1.75
No. 1 magazine	1.40— 1.50
No. 1 book stock	1.00— 1.20
No. 1 manila cuttings	1.50— 1.60
No. 1 print manila	.70— .80
Folded news	.50— .60
Over issue, news	.75— .90
Kraft	1.40— 1.50
No. 1 clean and mixed papers	.30— .40

NEW YORK MARKETS.

New York, June 4.—Fair activity has prevailed in the paper trade this week. Demand for all kinds of paper continues noticeably limited, yet all signs point to a gradual though slow revival of business, and certainly consumers in most instances are increasing the volume of their business to at least an extent. A majority of paper mills are securing enough business to keep them fairly welll engaged, and here and there are plants which are operating at very close to maximum capacity, while jobbers and mill agents with few exceptions report demand as showing some expansion.

Probably the most encouraging feature of the situation is that users of paper are beginning to regain confidence in prices. This is indicated by the marked increase in inquiry for the various kinds of paper and also by the gradual broadening of actual buying. While it is no more than to be expected that consumers are not absorbing normal quantities of paper in view of the situations existing in virtually every consuming trade, the fact that better buying interest is shown and that users are less inclined to hold off because of fear of a further sharp decline in prices is a healthy and encouraging sign.

Efforts are being made to settle the strike of newsprint and pulp mill workers. Conferences have been held this week and present indications point to an amicable agreement being reached within the next few days, thus bringing to an end the shutdown of this class of paper mills. It is understood that newsprint manufacturers have proposed that operatives return to work at 75 per cent. of their wages when they went on strike, with an agreement that the difference to be decided on by an arbitration committee will be paid when a decision is rendered. The International Paper Company, which has not joined in the conferences with union leaders by other manufacturers, has made a flat offer of taking the strikers back at 21 per cent. reduction in wages, and it looks as though the mill workers will accept this offer. Fortunately, the strike of newsprint and pulp milll operatives is about the only labor disturbance of any moment now affecting the industry, and a settlement of this controversy would undoubtedly go far in helping to stabilize not only that part of the industry immediately concerned by the strike but the entire industry.

Reports that have reached New York this week having their origin in Montreal are to the effect that a further reduction in the contract basis on newsprint is being contemplated by manufacturers. These reports say that on or about June 15 announcement will be made of a cut in newsprint prices to contract customers to 4.75 cents per pound or $95 a ton. In some quarters of the trade this reduction is not viewed in a favorable light but in others it is held to be the best thing for the industry in that it willl tend to stimulate demand and lead at least some publishers to anticipate their forward requirements and prompt them to discontinue their present hand-to-mouth buying policy.

The tone of the local newsprint market rules fairly firm. Demand has subsided slightly as a result evidently of expectations that the strike of mill workers is nearing a settlement and that available supplies therefore will become larger, yet there is a broader buying movement than there has been in recent months. Transient buyers are absorbing supplies in rather free fashion and are meeting the prices asked, which range between 5 and 6 cents per pound on roll news for spot shipment. The contract basis is maintained at between 5 and 5.50 cents, with the leading producer stilll quoting the higher figure. There are still occasional reports of "distress" lots of newsprint being sold at sharp concessions in price, but such transactions are becoming more of an exception than the rule.

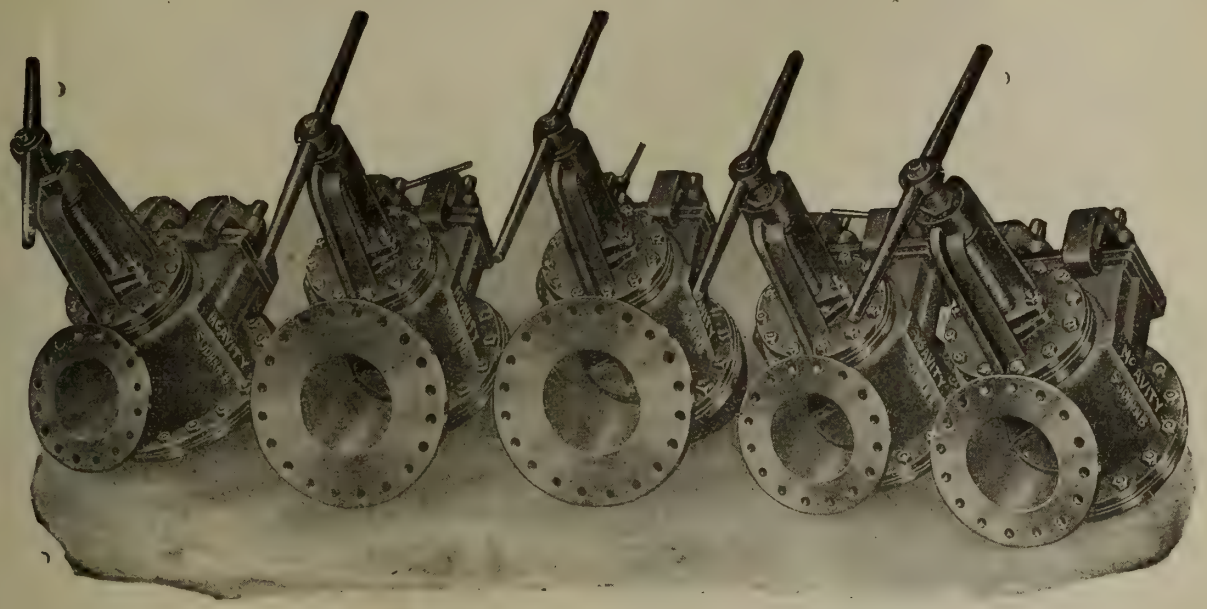
No developments have arisen in the book paper situation. Most of the current business is against contracts at steady prices, and mills are taking orders from spot buyers now and then at price recessions simply to get the business although market quotations are maintained. Wrapping papers are moving in fair volume at a price basis of between 6.50 and 7 cents on No. 1 domestic kraft, while tissue papers are meeting with a comparatively good sale, coarse grades in particular.

Quotations on fine papers are unsettled. In fact, it is a hard matter to ascertain just what constitute market levels, as practically every manufacturer is naming

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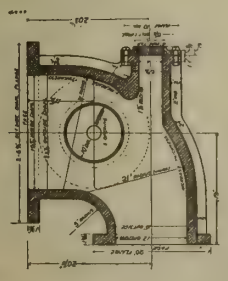




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A pattern equipment which is probably the most comprehensive in Canada for the needs of Sulphite Mills in Valves, Fittings and Specials, enables us to quote you rock bottom prices.

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a different price. There is only a routine demand for bonds and ledgers, and mills in general are in want of business.

The board market continues to improve. Board was the first to feel the depression in trade some months ago and apparently it is the first to show a revival of worthwhile proportions. Prices are not advancing but they are holding firm and evince an upward tendency. Boxmakers are absorbing larger supplies than in some time, and frankly acknowledge they are convinced board costs are down to as low a level as they expect them to reach. Plain chip board is quoted by mills at an average of $32.50 per ton at shipping points and filled news board at $37.50.

GROUND WOOD.—A steady undertone characterizes the ground wood market and although trading at present involves a smaller tonnage of pulp than in normal times, it can be said that the situation is showing more life than in a long period and that in the aggregate a fairly large amount of pulp is moving toward consumers. Moreover, all signs would seem to point to a large part of the surplus supply which existed at the time pulp mill workers went on strike a month ago has been removed, which fact obviously lends strength to the situation. Board mills are absorbing increased quantities of ground wood and there is considerably more buying interest displayed by other consumers. Prices range, on an average, at around $30 per ton f.o.b. grinding plants, with sales reported in some cases at higher than this level, and, on the other hand, in certain instances at lower figures, although it should be stated that manufacturers accepting less than $30 are situated at points where heavier freights oblige them to sell at such levels in order to compete with producers located nearer to consuming mills.

CHEMICAL PULP.—If anything, demand for chemical wood pulp has slowed up a bit this week. There is quite a good inquiry for several grades, notably easy bleaching sulphite and unbleached sulphite of news quality, but on the whole buyers have let down in their operations to an extent. Prices are unmistakably easy excepting possibly in the case of news sulphite, which holds steady at between 3.50 and 3.75 cents per pound at pulp mills. Reports have been received of sales of domestic bleached soda pulp at 5 cents a pound and of domestic bleached sulphite at close to the same figure, although average quotations on these grades range around 5.50 cents on the former and at about 5.75 cents on the latter. Domestic easy bleaching has sold at 4 cents a pound. Kraft shows little or no change, with domestic kraft quoted at about 3.50 cents and foreign kraft at a quarter of a cent higher.

RAGS.—Demand for roofing rags features the papermaking rag market and, judging from indications, the movement of this class of material toward mills is steadily increasing. Prices are firming, and sales have been recorded at slight advances, No. 1 satinets having sold at around 90 cents per hundred pounds at shipping points and No. 2 packing at 80 cents. Felt manufacturers are buying cautiously but they are nevertheless increasing the volume and number of their orders.

Other grades are in a quiet market position. Writing paper mills are doing little buying, and book and blotting papermakers are purchasing chiefly in minor amounts. New cuttings are largely neglected, with some grades practically unsaleable. Prices hold at about previously mentioned levels, with probabilities favoring buyers securing supplies in most quarters at recessions from the figures quoted.

PAPER STOCK. — Some grades of paper stock are in good demand and prices on such descriptions are gradually seeking higher levels. This applies particularly to old kraft paper, which consumers have sought with such freedom that quotations have been forced up close to 2 cents per pound at shipping points. Actual sales to mills at 1.85 cents have been recorded and most dealers now refuse to entertain offers under even money. White news cuttings also are firm and in fairly active call. It is doubtful whether purchases could be made at 1.50 cents a pound, as most dealers are asking at least 1.60 cents, and even at this basis offerings are slim. Soft white shavings are firmly quoted at around 2.35 cents f.o.b. New York for No. 1 packing, and old book stock is held for one cent a pound. Folded newspapers are fetching between 37½ and 40 cents per hundred at shipping points and No. 1 mixed papers 27½ to 30 cents.

OLD ROPE AND BAGGING.—Old manila rope is in moderate demand and is readily bringing 4 cents a pound at shipping points in sales to paper mills. Importations from Europe at New York recently have been a little larger but this seemingly has not affected buying, and there appears to be a ready outlet for practically all the supply offered. Old bagging remains dormant and is mainly nominal in value. Dealers offer No. 1 scrap bagging at 90 cents to $1 per hundred pounds and roofing bagging at 60 cents a hundred without attracting buyers.

JEALOUSY.

Jealousy in the Spanish River Company is downright foolishness. The policy of this Company is to promote men from within, provided those men have the ability, before a search is made elsewhere. This policy is carried out just as consistently as it is possible to carry it out. Superintendents and Managers must of necessity make the final decision as to who shall be promoted and who not. Individuals may have a very attractive but exaggerated conception of their own importance, but the way industry is organized to-day, individuals do not pass on themselves for promotion. That rests with the boss. If he says "go" we go, if he doesn't say a word we pitch in and hope for the next whack at the job. We don't sit down and blubber over our failure to rise when we thought we were the only ones to fill the bill.

There are men who get the idea into their heads that so-and-so is after their job. The somebody-after-my-job man worries himself sick and is supersensitive. Nobody wants your job so long as you can hold it down to the satisfaction of your superior. If you are not giving satisfaction you'll know it soon enough. The Spanish River Company is glad to have you working in the Mills or Woods. Enjoy yourself at your job. You spend the greater part of your waking hours on the job, and you must work to live, so you might as well have a good time while you're at it. Jealousy is devilish and in the industrial democracy which we are building, it has no more chance or place than the proverbial snowball in the warmer regions. Merit will win and nothing else.

(From the list of their term promotion and transfers in the same issue of the Spanish River News, from which the above is taken, one sees that the Company performs its promises.)

Experience teaches us what fools we have been, but it doesn't always prevent us from repeating.



Passenger Car Shop

On the Angus Shops of the C.P.R.—

ALL the new buildings comprising the Angus Shops of the Canadian Pacific Railway, at Montreal, are covered with Barrett Specification Bonded Roofs—a total area of 438,000 square feet.

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Four views of Barrett Specification Roofs on the Angus shops of the Canadian Pacific Railway, Montreal. P.Q. Architects: The Canadian Pacific Railway's Staff. Gen'l Contractors; The Foundation Company, Limited, Montreal, Roofing Contractors: The Metal Shingle & Siding Co., Limited, Montreal and Geo. W. Reed & Co., Limited, Montreal.

Besides these benefits to the owner, the Barrett Specification protects the architect and the general cnntractor against the use of inferior materials and improper methods of construction. It also gives roofing contractors an honest basis for competitive bids.

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Before specifying or closing contract for a Barrett Specification Bonded Roof, be sure to read carefully all the stipulations in the specifications. Full details regarding these Bonded Roofs and copies of the Barrett Specification sent free on request.



Left: Freight Car Shop

Below: East End Extension of Passenger Car Shop



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Turneezy	190 F	Purest ingredients.
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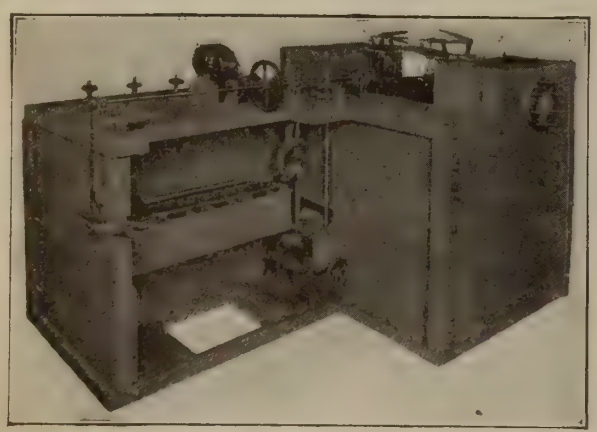
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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., June 16th, 1921. No. 24

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc. Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

APPRECIATED IN ENGLAND.

The April number of the Paper Makers' Monthly Journal contains an extensive review of the first volume of the series on the Manufacture of Pulp and Paper which is a preparation under the auspices of the Pulp and Paper Industry of Canada and the United States. The review is by the well-known analysts, Sindall and Bacon. Besides this review there is a book notice which gives in considerable detail the topics covered in the four sections comprising Volume 1.

The reviewers have evidently had some experience in teaching from their recognition of the different problems that the committee has endeavored to meet in the treatment of the subjects dealt with. It is intimated in the review that the elements of the science dealt with in Volume 2 should be treated at considerable length and we are sure that our English friends will be highly pleased with the manner in which these subjects are handled. We are glad to note a recognition of the Committee's endeavor to provide a text which is sufficiently elementary for a man with meagre education to catch on and carry on a successful study of the fundamentals of his own industry.

Sindall and Bacon recognize a fundamental difficulty in Vocational Education for the man in the mill when they state "the trouble is that the years from 15 to 18 when boys have liberty from school are wasted, so that the man of 18 to 20 years of age has to begin again." What is thus true of the English boy is even more applicable to a great many of the pulp and paper mill employees in Canada and the United States. It is generally understood that for the most part the English lad is further advanced in school than a boy on this side of the same age. It is true that a boy of 15 should be well beyond the first section dealing with Arithmetic but there are doubtless comparatively few in our mills who have studied, much less mastered, the principles of the Elementary Applied Mathematics of this Textbook and most of them are not familiar at all with the principles of Physics nor do they understand how to read drawings. In this connection it is noticed that the reviewers apparently expect only the younger employees to take up this course of study. Perhaps the majority interested will be under 25 years of age but it is more than likely that the older employees, having come to realize what a serious handicap a lack of education is, will be eager to make up for the deficiency of their own school days by a diligent study of a text relating directly and particularly to their own work.

The statement is made that physics cannot be taught respects helpful, but it can hardly be said that chemis- without some knowledge of chemistry. Some knowledge of chemistry is certainly desirable, and in some try is a pre-requisite to the study of physics. It will be found that sufficient chemistry is introduced at the point acquired to provide any such information necessary for the understanding of the principles of physics under discussion and in such form as to be readily assimilated.

The reviewers mention that in the explanation of Boyle's law it is necessary to mention a number of gases. There is no chemistry involved whatever. The plain statement that these substances are gases is a physical proposition and does not involve even the mention of any chemical facts relating to them.

Our mention of this review is not intended in any way to reflect on it because the Committee will greatly appreciate the careful way in which the book has been examined. It is rather to point out some differences in circumstances between the situation in England and in America with regard to the preliminary education of the typical mill worker. There is also perhaps a slight lack of understanding of the problem of home study and correspondence instruction which are phases of the situation that have been particularly in the mind of the Committee and have been the principal guide in the preparation of the work. It is probably inevitable that one who sees for the first time a single volume divided into sections and paged accordingly may be somewhat prejudiced in favor of the customary manner of indexing. We venture to suggest that an actual test would show no appreciable difference in the time it takes to find a reference by one or the other method. The intimation is correct that the convenience for other reasons of having each subject dealt with in a separate section is the principal point. Sindall and Bacon apparently recognize the necessity of providing this fundamental information for the proper study and understanding of such a later feature of the work as the making of sulphite liquor and other manufacturing processes. We shall await with interest the opinion of these reviewers when they receive the second volume which should now be on its way.

Orders for the set of five volumes may be sent to the Pulp and Paper Magazine (appointed to represent the Canadian Pulp and Paper Association) accompanied by $10 in payment for the first two volumes.

Accidents don't happen; they are caused.

THE U.S. TIMBER TARIFF.

It is feared in some quarters that the tariff recently adopted by the United States which provides for duty on lumber and $1.00 per thousand board feet on saw logs of certain species imported into the United States from Canada will have a serious effect on Canadian Industries. There are some people also who seem to think that this tariff is a direct attack on certain Canadian industries. This last assumption is most easily dealt with since a little reflection will show that most tariff measures come as the result of campaign pledges made prior to presidential elections. The Republican party and Republican platforms have always stood for the protection of American industries by means of the tariff. It is always to be expected therefore that a Republican victory at the polls will bring about an upward revision of import duties.

We feel that while there may be a temporary lull in exports of Canadian timber and lumber across the border this condition will not last very long because there is not sufficient timber available in many parts of the United States to supply the demand. It is entirely likely, as we see it, that the effect of the new tariff will be increased prices for American lumber and increased prices on stumpage by those who hold timber and realize that a duty of 25% is really an increase of 25% in the potential value of their woodlands. It seems that this increased valuation and the chance for the lumberman to increase prices of his product will result for a while in greater demands on American standing timber and provide that much relief for Canadian forests. The result in Canada may be a slight reduction in lumber prices for quantities on hand and a consequent stimulus to building operations and a somewhat wider employment of labor as well as more and cheaper dwellings. Such a result would not be without its advantages and might even result in less drastic inroads on our forests. That would really be to Canada's advantage. Another possible result would be an earlier appreciation of the propriety of putting an export duty on pulpwood.

On the whole it looks as though Canada would get pretty nearly as much benefit from the American import duty on lumber as the United States and that the farmers who demanded a duty on Canadian grain will get a dose of their own medicine. As far as considering such action as being directed against Canadian industry our advice would be, "Forget it."

SCIENCE SAVES WASTE.

It is gratifying to note that the Canadian Manufacturers' Association at their recent convention in Quebec took official notice of the unfortunate failure of the Senate to appreciate the advantages of scientific research sufficiently to approve and pass the bill for a National Research Institute. One of the principal functions of such an institution is to point out ways of conserving the wastes from our various industries.

One source of waste is the bark and wood removed from the blocks in preparing pulpwood for conversion by chemical or mechanical processes into a material suitable for paper manufacture. This waste may run from 8 to 18 per cent., or even in some cases a higher percentage of the wood bought by the mill. In removing the bark particularly by the knife barkers, there is a considerable loss of solid wood. The loss of this material, which has to be paid for, is not only an economic waste but is even a community nuisance, the disposal of which generally entails an additional expense. It is frequently burned as a low grade fuel but if it happens to come from wood just out of the river or for other reasons practically saturated with moisture it must be pressed before it will burn. It is sometimes used for filling in swamps and the like but there is no particular financial return from such disposal. It may be run into the rivers but such a practice is likely to be objected to.

An experiment carried out not long ago at the Forest Products Laboratories in Montreal with the equipment provided at that institution for the investigation of problems connected with the Pulp and Paper Industry resulted in a product which has an economic value. The experimental beater which is equipped with a lava stone roll, was furnished with the wet barker waste obtained from a drum barker by taking a sample of the ordinary run of refuse. After refining this material for 1½ hours it was made into sheets and tested for a possible commercial use. The material in itself has considerable strength but shows shives, which, if the material had been refined in a large size beater would undoubtedly have been reduced to a fibrous condition and thus have increased the strength of the sheet. It is evident that this material could very well be used as a filler up to 25% or more in the manufacture of board. Waste from knife barkers would undoubtedly have a larger proportion of wood substance and therefore possess greater strength and permit a larger percentage of this otherwise waste material to be used in board manufacture.

A study of the power consumption in running the experimental beater indicates the requirements will be approximately 120 H.P. hours per ton of pulp refined in mill apparatus.

Since this material has but little fuel value and where not used as such its disposal is an unproductive expense and since it can be furnished to the beater without previous drying it certainly appears to be commercially feasible to refine barker wastes in a stone roll beater or other suitable equipment and produce a marketable product.

The mention of "other suitable equipment" was made intentionally because that intimates another factor which could and should be investigated in this connection. This is but an instance of the kind of work which could be carried on by the Pulp and Paper branch of the National Research Institute that would be to the advantage of the country.

Group Insurance in the Paper and Pulp Industry

By A. C. CAMPBELL.

The executives of a Canadian paper pulp concern Group Life Division, Metropolitan Life Insurance Co. wanted to do something for their people. They had studied and were pleased with the operation of Group Insurance in an American firm with which they were affiliated; Group Insurance would help create good will — an invaluable asset among employes when it became known that the firm would continue the pay envelope for a certain number of months to families on the death of wage earners. It would add to the firm's reputation for fair and liberal dealing among workers. It would provide much needed protection at low cost and without medical examination — obvious advantages from the standpoint of the insured individual. It would take care of total and permanent disability as well as death. It would do away with the "passing of the hat" in the plant. By increasing the amount of protection with the worker's years of employment, Group Insurance could be used to reward length of service.

But the executives of this concern had more than insurance in mind. They were interested in the development of a better community.

They were appalled when the parish priest, a man keenly alive to the well-being of his people, told them that 60 per cent of the babies in the community died before reaching three years of age. They understood just what this alarming death rate meant to the town. Anxiety, unhappiness and discontent are by-products of sickness and death. Men who worry over sick children at home do not do a good day's work. Men and women who can not make ends meet because of the heavy expense of sickness and burial lower the morale of a community.

They began to look around for means of improving conditions. They realized that while they could do much themselves, they needed other help in putting over their program. We were pleased when this well known paper pulp concern came to us for Group Insurance and thereby entered into a partnership with us for better industrial health, better living conditions, and a better community.

They secured a district nurse, a college graduate who had received her professional training in one of the finest hospitals in America. She visited the homes of sick workers—our company provides visiting nursing service to those insured under a Group policy when the Group policyholder is within a Metropolitan nursing district — gave bedside care, carried out the doctor's orders and instructed the family in the care of the patient.

With the co-operation of the French priest and the English rector and the active encouragement of an extremely progressive pulp mill management, a health program was initiated.

Our health literature, written in French, was distributed regularly to employes and special consignments of posters and booklets in regard to the care of children were used in "L'Ecole Maternelle", the school for mothers founded by the nurse to cut down the high rate of infant mortality. A slide with a picture of the visiting nurse in the home was shown in the local moving picture house. The mill installed a wonderfully equipped first aid room and arranged for the care of dressings for injuries. The establishment of a milk station is under discussion. In all this work the form is consciously using Group Insurance with its collateral advantages of visiting nursing and the vast experience of our company in health propaganda to carry out their industrial relations and community betterment program.

What Group Life Insurance Is.

Group Insurance is life insurance taken out by the employer for the employee. The policy is issued to employers having fifty or more workers and may cover all employees, or all of any one class — for instance, the whole force of a construction company may be insured or simply the office force of the organization. An employer only can buy this kind of protection. The insurance may be under three general plans:

(1) a flat sum such as $1,000 to all employees;

(2) an amount equal to a year's salary, or a part thereof;

(3) an amount varying with length of service.

The last is considered the best method because it encourages stability in a working force and so brings bigger returns on a Group Life investment.

The minimum amount of protection obtainable under this plan is $500 and the maximum $5,000, the expense being met either by the employer or by the employer and employee on a joint payment plan, but when the premium is to be paid by both, seventy-five per cent. of the employees must accept the agreement. The greater proportion of employers carrying Group Life Insurance have seen fit to pay the entire cost of protection themselves.

Should an employee become totally disabled before sixty, he may draw the benefits which would otherwise be payable at death, except that the money is usually paid in installments instead of a lump sum.

In case a man leaves his job he has the right of converting his policy within thirty days to an individual policy with a physical examination.

The employee always names the beneficiary, and under no circumstances can the employer be nominated.

Group Insurance is sold at wholesale rates. It costs materially less than other insurance because it does not stand the expense of medical examination and eliminates much clerical work. Covering groups of, from fifty to fifty thousand people on a wholesale basis is necessarily a much less expensive proposition than carrying insurance on an individual basis.

Everyone insured under a Group policy receives a certificate which designates the amount of insurance, the beneficiary and the general features of the plan. The distribution of these certificates often becomes a great occasion in many plants.

When the American Writing Paper Company, which has initiated an extensive program of emergency treatment in hospitals, home visiting, nursing, safety work, and educational and recreational facilities for its force, gave Group Insurance to its 4,000 employes, the president of the Company, Mr. George A. Galliver, sent a special invitation to each worker and one adult woman member of his immediate family to attend a "Christmas meeting." "A pleasing surprise" was promised.

On Sunday, December 15, 1918, hundreds of men and women gathered in the three halls where meetings were scheduled at various hours. An orchestra opened the program and the audience joined in community singing,

Mr. Galliver announced the object of the meeting and Mr. J. E. Kavanagh Third Vice-President of the Metropolitan Life, explained the benefits of Group Insurance. Needless to say all welcomed the gift of free insurance.

Better Industrial Conditions.

Insurance companies are consciously co-operating with progressive employers in their endeavors to better industrial conditions. Firms selling insurance are business organizations, first, last and always; but in handling Group Insurance they have learned that service which helps employers develop a program for improving conditions in industry is good business.

Take the average manufacturer, whether his business is large or small, safety engineering, the hiring, training and retention of men, wages, hours, profit sharing, industrial government and medical aid are but a few of the human relationship problems that come to an executive's desk through the year. It would take a hydra-headed individual or a large staff of experts to handle such problems adequately. Through their contacts with many employers in different industries, companies selling Group Insurance have an opportunity given no other organization to gather and distribute industrial information.

The Metropolitan, in conducting its Group business takes this view-point — when an employer buys Group Insurance he is strengthening his industrial relations program, by recognizing that his men have needs—i.e., protection, which he can procure under more favorable circumstances than the men themselves, and he accepts his responsibility as a leader and an industrial executive by helping them obtain these necessities. He realizes that death, sickness and unprovided old age with their concomitants of expense and anxiety affect his community, his industry, his shop. If he is to be an efficient manager he must face these emergencies. Group life, Group Health and Group Pensions answer his problems.

With the motive of the employer in mind our company endeavored to find out what service of equal advantage to employer, employee and insurance company could be offered to make Group Insurance more effective. Health propaganda became the solution of our problem. Better health means more working days and a bigger pay check to the employee, more production and less absenteeism for the employer and a lower death rate and fewer death claim checks for the insurance company.

A visiting nursing service wherever our company maintains a nursing district is at the disposal of Group certificate holders. The nurse goes to the homes of workers, gives bedside care, carries out the physician's orders and tells the family how to care for the patient. Many a sick or injured man has been saved time and wage loss by the expert care of a trained graduate nurse, who does her best to get him back on the job as soon as possible. The visiting nurse, particularly if she has vision, is often one of the leading social agents in her community. Clean up campaigns, organized warfare against epidemics, child welfare work, improved sanitation, better supplies of milk and water and many other public health activities are fostered by the nurse.

The distribution of health literature is another part of campaigns for the prevention and cure of disease. Metropolitan booklets, effectively illustrated, and simply written, have been prepared by experts, such pamphlets as "How to Live Long", "How to Be Happy and Well", "First Aid in the Home", "All About Milk", "The Child", "Food Facts" and the "Cook Book" carry the good health message to the home. Others on tuberculosis, smallpox, typhoid fever, and diphtheria are valuable in time of epidemics. As practically all of these have been printed in French, many paper pulp manufacturers have used them among their French Canadian employees.

Bureaus which aid employers in the solution of their industrial relations problems have been established by insurance companies. Questions involving employment, methods of training employees, means of determining and reducing labor turnover, employment forms, housing schemes, safety first work, profit sharing, organization of employees' associations, the installation of plant magazines, co-operative stores, and lunch rooms come to our bureau every week. Probably the scope of this work can best be shown by specific examples.

A paper pulp concern of approximately several thousand employees wanted to form a mutual benefit association; a plan was drawn up which secured a 98 per cent. membership in ten days. Ventilation in the digester room of another concern was greatly improved by the use of a method employed by a policyholder in the same business. Still another sent in accident reports and received suggestions for reduction of injuries. The accountant of a large mill who wished to install new office equipment and consolidate the filing system of his company could not visit New York to hire a high grade employee to take charge of the work. Our bureau put him in touch with an organization able to help him get in touch with the right man. Write-ups on Group Insurance were furnished many firms having house organs. Programs for the meetings of various technical organizations were sent interested policyholders.

Firms having a small force consider industrial service invaluable, for they cannot afford to maintain a staff of experts and their executives have little time for, but often interest in problems dealing with the human factor in industry. An employment system, consisting of an application blank, a quit slip, a daily employment blotter and monthly turnover analysis sheet was installed in a concern having about 200 employees. The management wanted to publish a house organ, so a dummy was drawn up for the first issue. They were interested in training their foremen and a study on the subject was sent them. The variety and the extent of the information policyholders call for, indicate that the service bureau maintained for employers will probably become the greatest and the best of exchanges of practical experiments on the human problems that confront industry.

Do Employees Appreciate Group Insurance?

Again and again employers and employees send us stories, letters or resolutions which exemplify the workingman's good opinion of Group Insurance. Shortly after one of our policyholders bought Group Life Insurance an old man who had worked for him fourteen years stepped up to him about two months after he had received a Group certificate.

"It's the best thing anybody ever did for me since I was a child", the old man said, "You know I haven't saved any money. Taking care of the children took everything I had. Now the wife and I are getting along and I tell you I've worried a good deal about not having anything to take care of her in case anything happened to me. But this insurance has settled my worries". The old man's happiness was so evident that he made his employer happy.

Mr. Fred Johnson of Kingsport, Tennessee, tells an incident which illustrates the appreciation some have for

the work of nurses. Mr. Johnson was standing in line before the polls on election day when he heard a mountaineer discuss the illness of one of his children. As all workers in Kingsport are covered by Group Insurance, Mr. Johnson asked him whether he had called in the Metropolitan nurse.

"Yes", the mountaineer answered and then added reflectively, "Ain't them the loveliest gals you ever see!"

The widow of a deceased employee of a trust company wrote the firm her thanks for a check sent her; "Will you please accept my heartfelt thanks for your most liberal and generous consideration at the time of my husband's death? In acknowledging receipt of the check for $1,000, I want to say that I am most thankful that my husband was employed by the C.....Trust Company. I feel that I lack suitable words to express my gratitude and appreciation to the Company for their generosity".

Several hundred employees who had been called together by the president of the firm cheered him enthusiastically when he announced the company was giving them Group Insurance. "I have been with this concern twenty years, and seventeen as president," he said to me later with tears in his eyes. "This is the first time my men have ever cheered me. I want to tell you right now if Group Insurance never did another thing, it is worth what it cost". He felt kindly to his people, his heart was in the right place, but he never had a chance to express to them his real sentiments until Group Insurance gave him the opportunity.

The ever increasing number of firms purchasing Group Insurance is evidence of its worth. The American Writing Paper Company, the Belgo Canadian Pulp and Paper Company, the Brown Company of Berlin, N.H., the Brown Corporation of La Tuque, Canada, which was the first Canadian firm to buy Group Insurance, Finch, Pruyn & Co., the Howland Pulp & Paper Corporation, the Laurentide Company, The Mead Fibre Company, the Oswego Falls Pulp & Paper Company, The Spanish River Pulp and Paper Mills, and The Victoria Paper Mills Company are some of the important concerns in the paper business which have taken our Metropolitan Group policies.

A Good Investment.

A business man insures his buildings, his machinery, his business, himself. He protects his property against fire, theft, and the elements. He protects his family and his business associates from financial loss that necessarily comes at his death.

Today the insurance companies who protect the manufacturer, the merchant and the banker in times of necessity are marketing Group Life Insurance with collateral service as a means of furnishing common ground for worker and employee. This new form of insurance, which often brings with it the by-product of interest, co-operation and friendship tends to safeguard the employer from industrial ill will and misunderstanding, and wards off anxiety and debt from the employee.

The worker realizes that he is getting more than a weekly pays envelope; he appreciates the personal interest of the boss who gives him an estate of $1,000, who has a thought for his family, who gives him often what he cannot buy for himself.

Group Insurance helps to gain the confidence of the worker and so improves the morale of the organization. For this reason it always has a place in the industrial program of the employer who builds for tomorrow by establishing today sound permanent relations with his men.

STABILIZING THE PAPER INDUSTRY.

A Lesson for Those Who Will Learn.

The paper trade has been interested for a long time in the general standardizing of papers, that is, in theory; but so far it has remained for the American Writing Paper Company, the largest manufacturers of fine paper in the world, to put the theory into actual practice on a complete line.

Perhaps paper is not so easily standardized as machinery, or bricks, or loaves of bread, since it is a product that has long been considered as impossible to make of uniform quality. That is one of the reasons there are thousands of names of bonds, ledgers, and other papers on the market today.

Since the war, which has taught American business one important lesson — that a confusing mass of varied styles or grades of products is economically unsound, slows up the manufacturing process, and delays progress, the American Writing Paper Company, through its scientific laboratory, has especially devoted itself to studying how the reduction of the thousand and one brands of paper could be effected and yet at the same time the real needs of paper-buyers be met.

This the company has done by the simple but practical means of reorganizing its mill output. To put it more explicitly, it is manufacturing a standardized grade to take the place of odd grades which over-lapped and confused.

As a definite accomplishment it announces the standardization of seven Bond Papers of rag content, two Bond Papers of wood fibres, five Ledger Papers, four Writing Papers, four Linen Papers, five Cover Papers, nine Book Papers, four Offset Papers, five Bristol Boards, three Drawing Papers, two Mimeograph Papers, three Blue Print Base Papers, five Weddings and Papeteries, six Basic Specialties, one complete Announcement Line, and one complete line of Hand-fashioned Papers.

It is interesting to note that already the indorsement of this plan of standardization has been given by seven national organizations devoted to printing lithography, engraving, and stationery.

Agreeable to policies of Herbert Hoover, the matter of standardization is being worked out as far and fast as possible in all industries. The plan of the American Writing Paper Company has met with the approval of John F. Williams of the printing and paper department and Robert B. Wolf of the pulp and paper department of the department of commerce, both of whom were delighted in investigating to find that the matter of standardization and stabilization had reached to such an advanced point as manifested by the American Writing Paper Company.

It is the company's aim to build up, through leading merchants, a distributing system that will concentrate on the standardized lines.

In conclusion, the standardization of the lines will mean to the paper merchant that it will be easier for him to satisfy the need of customers and will at the same time facilitate the turnover of his stock.

To the printer, the lithographer or the stationer, this standardization means accessibility of supply and quick service as well as a faster turnover.

For the manufacturer, through the possibility of concentrating the raw material for long runs, and its purchase in large quantities at a lower cost, it will mean a greater uniformity for this product. Above all, it will mean more economical and efficient service to the consumer.

CHEMISTS OF THE EMPIRE TO MEET AT MONTREAL.

A great event in the history of organized chemistry in Canada will be the annual meeting of the Society of Chemical Industry which will be held at Montreal August 26th to the 31st. A tentative program with questionnaire has been sent to all members of the Society by Mr. C. R. Hazen, Honorary Chairman, 84 St. Antoine Street, Montreal, and replies should be sent to him as early as possible by all of those anticipating attendance at the meeting. From the following program it will be seen that every effort is being made to bring about an event that will be not only a pleasant memory but an instructive and valuable experience to those who do us the honor of coming from the old land. A very fine series of industrial visits has been planned, including Montreal, Shawinigan Falls, Ottawa, Toronto and Niagara Falls, and the addresses and technical papers are such as will surely set forth the accomplishments and opportunities connected with the industries in Canada dependent upon the application of chemistry to the processes involved. The committees in charge of entertainment are making some excellent arrangements and we are sure that they can count on the co-operation of any branches of our industry in the localities to be visited by the attending chemists.

Any persons interested in chemical industry who have not received notices from the Committee on arrangements may obtain information from Mr. Hazen who will be glad also to receive any suggestions regarding the development of the program. Incidently, this will be an appropriate and opportune time to make application for membership in the Society of Chemical Industry.

The tentative program follows:

NOTE. — Changes, if any, and additions to this program will be published at the Montreal Meeting.

CANADIAN PROGRAM.

From Montreal to Toronto the guests will be continuously cared for on sleeping cars. At Toronto accommodations will be arranged for at the University residences.

Friday and Saturday, August 26th-27th.—Reception Committee meets visitors.

Sunday, August 28th.—Golf — Motor trip around City and Island.

Monday, August 29th.—Morning, 10.00 a.m. Council meeting, McGill University; 11.00 a.m. Annual meeting, (a) Address of Welcome. (b) Reply. (c) General business of the Society.

Afternoon, 1.00 p.m.—Civic Reception and Lunch. 3.00 p.m.—Special visit to McDonald Agricultural College. Supper and Garden Party.

Tuesday, August 30th.—Morning, 10.30 a.m.—(a) Address. (b) Pulp and Paper Symposium (3 papers).

Afternoon, 1.00 p.m.—Luncheon at Windsor Hotel given by Montreal Section. 3.00 p.m.—Visits to various Industrial Plants.

Evening, 7.30 p.m.—Banquet, Windsor Hotel.

Wednesday, August 31st.—Morning, 10.00 a.m.—Special addresses and technical papers.

Afternoon, 1.00 p.m.—Luncheon at Windsor Hotel, given by Montreal Section. 3.00 p.m.—Special Convocation at McGill University. 4.00 p.m.—Trip down Lachine Rapids.

Evening, 11.55 p.m.—Leaving by night train to Shawinigan.

Thursday, September 1st.—Shawinigan. — Visits to Grand'Mere and Shawinigan Falls Industries, under the auspices of Shawinigan Falls Section, S.C.I.

Friday, September 2nd.—Ottawa — Visits and entertainment, under auspices of Ottawa Section.

Saturday, September 3rd.—Toronto. — Visits and entertainment, under auspices of Toronto Section.

Sunday, September 4th.—Toronto — Visits and entertainment, and by boat to Niagara Falls, under auspices of Toronto Section.

Monday, September 5th.—Niagara — Visits to industries on Canadian and American sides.

With regard to the probable expenses of members attending the annual meeting at Montreal and of those taking the Canadian Excursion, while costs depend upon the tastes of the individual members the following statement will serve to give roughly the necessary expenses:

PASSAGE FARES

Montreal to Shawinigan and return	$ 6.85
Montreal to Toronto via Ottawa	13.45
Toronto to Niagara by boat	3.30

SLEEPING CAR FARES

Montreal to Shawinigan	3.00
Shawinigan to Ottawa	3.30
Ottawa to Toronto	3.30
	$33.20

	Single	Double	
Hotel Montreal	$4.50	$7.50	
August 27 to 31st, 4 days			$18.00
Meals (2 meals per day)			8.00
Aug. 31 to Sept. 5th, 5 meals			8.00
			$34.00
Total Expense to U.S. Border			$67.20

T. A. P. P. I. TO HOLD JOINT FALL MEETING WITH SUPERINTENDENTS' ASSOCIATION.

It has been practically decided to hold the Fall meeting of T. A. P. P. I. at Washington and Philadelphia during the week ending October 22, 1921. This will be a joint meeting of T. A. P. P. I. and the American Pulp and Paper Mill Superintendents' Association. Arrangements at Washington will be in charge of Fred. A. Curtis, Paper Section, Bureau of Standards, while Grellet N. Collins, of Dill & Collins, will direct the program in behalf of T. A. P. P .I. at the Philadelphia end. The convention dates will probably be fixed for October 19, 20 and 21. The tentative arrangements provide for sessions for the reading of scientific papers at the Bureau of Standards on Wednesday, October 21, the opening day of meeting, to be followed by an inspection of the paper mill plant and laboratories of the Paper Section. On Thursday, October 22, inspection trips will be made to the Government Printing office, the Bureau of Engraving and the mills of the District of Columbia Paper Manufacturing Company, followed by a boat ride on the Potomac river, supper to be served on the boat. At midnight all will board Pullman cars for Philadelphia where Friday will be spent in mill visitations, the following plants being included in the itinerary: Dill & Collins Company, W. C. Hamilton & Sons, Inc., McDowell Paper Mills, Philadelphia Paper Company, Moore & White Company, Keystone Paper Mills Company. Mills in Delaware and New Jersey may also be visited, those convenient of access being the Jessup & Moore Company and Pusey-Jones Company, in Wilmington, and the dyeworks of the du Pont company in New Jersey, besides one or two mills there.

British Trade News

(From Our London Correspondent.)

London, June 1, 1921.—Lately the British paper mills have been immune from outbreaks of fire and mill-owners were beginning to congratulate themselves until the news arrived from Alloa, in Scotland, that 500 tons of esparto grass belonging to Messrs. J. A. Weir, Ltd., Forth Paper Mills, Kilbagie, had been destroyed. Fortunately the mill escaped damage. At the Springwell Paper Mills, in Jarrow, owned by Messrs. W. H. and A. Richardson, a motor garage was destroyed by fire and four motor lorries in it. The damage is estimated up to £6,000.

Messrs. Becker's Profits.

This week the annual meeting of Messrs. Becker & Co., Ltd., who make a specialty of Canadian pulps, will be held in London. I understand their accounts show a gross profit of £117,979. After allowing for certain charges, debenture interest, and trustees fees (£55.359) there remains £62,620, to which is added the balance (£13,917) brought forward, making £76,537 13s. 11d. As the conditions prevailing throughout the world are difficult, the directors propose to especially reserve £50,000 against stocks and shipments overlying and to pay a final dividend of 10 per cent, free of income tax, making 15 per cent for the year, carrying forward a balance of £16,537 13s. 11d.

The Anglo-Newfoundland Development Co., Ltd., state that their accounts to August 31st, 1920, show a profit, less depreciation, interest on loans, etc., of £165,-559. After providing for debenture stock interest and sinking fund there remains a credit balance of £195,-661, inclusive of £64,610 brought in.

The Star Paper Mill has declared an interim dividend of 18 cents (9d.) per share.

Strike and Depression Continues.

The situation in the coal mining industry is unaltered and the miners strike continues. As each week passes by one hears of a mill closing down and the latest to become affected are the Stoneywood Paper Works, of Messrs. Alexander Porie & Sons, Ltd., Aberdeen, owing to shortage of coal. As a matter of fact from an industrial point of view the position is becoming desperate and there are no signs of the strike ending. At Aberdeen, for instance, the dockers in the harbor struck work out of sympathy with the miners and refused to handle foreign coal, but a number of men from the Donside Paper Mill were got on board the "Athena" from Holland and transferred the coal, with which it was freighted, to the bunkers of the "Gyp," which had brought in 4,823 tons of groundwood from Halifax, N.S., for Messrs. Becker & Co., Ltd. The unemployment roll in paper mills is now a very depressing sight. Things are so bad one of the paper mills in the north of England had to give stores of coal from stock to help keep the local hospital going for the sick of the town.

Trading With Canada.

Addressing the shareholders of Wiggins, Teafe & Co. (1919), Ltd., Mr. P. W. Holden, the chairman, said the firm had increased and strengthened their sales organization, and extended their borders. Mr. Hay, their sales director, was at present visiting America and Canada, where he had been for the past four months. In Canada he had succeeded in reopening old accounts closed during the war and in opening new ones. In the States where the firm had hitherto failed to do any business at all, he had opened up business with a firm in New York which would undertake an agency and from whom they anticipated large orders. Mr. Holden then exclaimed: "As soon as the tide turns we shall run in on the flood; of that I have no fear." Wiggins, Teafe & Co. own several mills in the United Kingdom.

Death Removes old Papermakers.

The hand of death has passed over the British paper industry and removed Mr. Henry Hobday in his 84th year. He was making paper away back in the early fifties, just when groundwood was being introduced as a raw material. He spent most of his time in Kent and had a varied experience in several mills. Mr. Joe Singleton, for sometime a director of the Bury Paper-making Co., Ltd., has also died. He was a great man on aniline colors for the paper industry and was much respected.

The Newsprint Agitation.

The decision of the paper makers to try and get included in the Anti-Dumping regulations, papers from countries with debased rates of exchange is being vigorously opposed. Indeed there is now a general movement to try and get the Imperial Government to drop the Bill altogether, but the Prime Minister says it must go on. Sellers of foreign papers in London are much disturbed by the contention of the paper makers and meetings are now being held for and against the Bill.

Boiler Stoking.

Recently very great attention has been given to oil fuel and as time passes on one hears of more industries absorbing it in place of coal. There is no doubt oil fuel has come to stay in the United Kingdom, but we have not yet heard what the paper producers as a whole think of it though some are using it. Another important matter in mills, and one which Canadians may be interested in, is the fireman stoking the boilers and his methods. The question naturally arises: Have you a trained fireman? If he is not a trained man see that he is. There is no use giving a fireman a shovel and coal and telling him not to let the steam pressure down. Among other things he should know how to use the CO_2 recorder and get up steam on the smallest amount of coal. If the fireman is neglected there is a big coal bill; if he is trained under a system there will be a big saving in the boiler house, less black smoke, and less ashes to handle. In some of the English boiler houses the engineers have taken the fireman in hand and and educated him on the latest devices in saving coal, as well as showing him how to stoke a boiler. At first the tuition was somewhat resented, but the fireman is now well pleased with the results.

Cotton Seed Fibre in England.

Viscount Doneraile presided last week at the annual meeting of British Cotton Seed Products, Ltd., which has obtained a factory at Chatham, on the river Medway. The company has also acquired special rights for the "Segundo" cotton-seed defibering machine, and they now own the world's rights, except in U.S.A. With regard to the residual fibre, the directors say they see no reason to depart from the original estimate of its value and much evidence has come to light since the company was formed of considerable expansion in markets for this raw material for papermaking and other purposes.

The Pulp Market.

The coal strike is preventing any business being done. What with mills closed, or on half-time, and a poor demand for paper it must be expected that the pulp market is lifeless. Prices for chemical and groundwood pulps are easier, but still the papermaker will not yet

ture on business negotiations. Some sellers are holding out hopes of good times when the strike is settled. Certainly the industrial outlook at the moment is none too grand and it will take the paper mills and the coal industry some time to recover the present set-back. Spot prices are about as follows:

Bleached sulphite, £35; easy bleaching, £26; sulphite newsprint quality, £23; unbleached soda, £25; and soda kraft, £22.

Groundwood (wet) is £7, and groundwood (dry), down to £13·15—£14.

During the month of May some good shipments of groundwood and chemical pulps were received from Canada.

Chemicals.

Owing to many of the pulp mills being closed down in Sweden, saltcake is not in request and can be reported at £7 10s. a ton. Throughout the industrial chemical markets there is very little business passing and papermaking materials are consequently easier for prompt transactions.

Suggestions in the Mill.

In some British mills workers are invited to make suggestions which will help the output, improve machinery, or help in economizing. I have heard of one small mill where 62 suggestions were sent in between June, 1918, and February, 1921, and out of these 25 were accepted, the rewards being from $1 to $20. One worker was so keen that he asked to be allowed to go back and specialize in two departments where the work was not on an economical basis. Permission was given and he eventually presented a report which proved most valuable to the millowners in achieving their long desired objects in the two departments concerned. It is another instance of what welfare work can do, if properly handled.

Empire Press of Canada.

Mr. Robert Donald, chairman of the Empire Press Union, has sent King George a copy of the book on the visit of the Imperial Press Conference in Canada. It is a fine record, including visits to pulp and paper mills. Lord Standfordham in acknowledging the book says: "The King is glad to have this interesting account of a great achievement, which must always be a notable landmark in the history of the Press, and notes with pleasure the feeling of happy comradeship that characterized the proceedings of the conference." The book contains 125 engravings and the reading matter runs to 300 large octavo pages. Certainly this trip amid Canadian industries has created a great impression.

WHY THE TECHNICAL SECTION IS.

If I have an orange, and give it to you, the orange is no longer mine. I must either replace it with another orange, or do without. If I had given you a half an orange, neither of us would have had a whole one.

If some man has developed an idea which solves a troublesome business problem, the idea is of real value —like the orange. If you are trying to solve a similar problem, that idea is likewise of real value TO YOU—like the orange.

That other man, with the idea you need, can give you the WHOLE idea and still KEEP THE WHOLE idea, too. He has lost nothing, and you have gained all.

—Efficiency Magazine.

HOW WE CAN MAKE OUR DOLLAR WORTH 100 CENTS.

"Got anything like that in stock?" asked a printer the other day, laying before the paper salesman a sheet of bond from the sample-book of a United States manufacturer.

"Certainly," answered the salesman promptly. "Here's practically the same thing." And he picked out a sample from his own book.

The printer held it to the light and looked it over carefully. Then he turned to the salesman.

"That's good stuff," was the comment. "No dirt, no pinholes, fine, even texture. . . . Do you know, he confessed, rather shamefacedly, "I didn't think Canada made as good bond as that. You can send me five reams. And," he added, "I'm going to pay more attention to Canadian-made stock hereafter."

A Canadian-made Paper for Every Purpose.

Printers are busy men. They have no time to go carefully over every jobber's sample-book that comes to their desks. That is probably the reason why Canadian printers sometimes appear to overlook the fact that, in high quality, color range and variety of choice, Canadian-made papers are fully equal to any of their foreign competitors.

Quick Service for Rush Jobs.

And they can be obtained on the spot. Rush jobs—and what printer doesn't know the customer who insists upon getting his work straight off?—demand quick service. The 'phone call, sample sheets rushed over from the dealer, the stock selected, and delivered within a few hours. That's possible when buying Canadian papers. Compare such service with the delays involved when stock is ordered from some manufacturer outside Canada.

Getting Ninety Cents' Worth of Goods for a Dollar's Worth of Work.

There are some commodities which must be imported —but paper is not one of them. And as long as Canadians decline to buy it here in Canada, the various raw materials which we **must** bring in from the outside will have to be paid for in depreciated dollars; dollars that mean a hundred cents' worth of work to Canadians but for which we get only from eighty to ninety cents' worth of goods—if we do our shopping south of the border.

The Kind of Paper you use Affects the Price you Pay for Clothes.

Your choice of paper affects the price you pay for clothes, for rent, for practically every article you use. The reason is simple enough when you stop to figure it out. Canadian dollars will not go back to par until we cease to import more than we export. As long as we get for our dollar only, say, ninety cents' worth of coal, of oil, of all commodities that **must** be imported, Canadians will be handicapped by higher manufacturing costs than our neighbors in the United States.

It's not a question of patriotism, but of sound, efficient business. Better business, lower manufacturing costs throughout Canada, mean more work for the printer. And printers can help to bring this about by buying, whenever possible, PAPER MADE IN CANADA.—Canadian Pulp and Paper Association.

A true diplomat can say something pleasant to a collector, even though he hopes never to see him again.

The Preparation and Use of Colloidal Rosin

By DR. J. H. FRYDLENDER.

(Translated and abstracted for the Pulp and Paper Magazine by A. Papineau-Couture from La Revue des Produits Chimiques, 24, 173-8, March 31, 1921.)

When Graham first studied the difference between colloids and crystalloids he considered the former as *classes of matter;* but more recent work carried on during the last decades has established that they are a *state of matter.* The Russian chemist von Weimarn succeeded in working out the general principles which enable us to bring all matter to the colloidal state. Even sodium chloride has been obtained as a colloid. The ratio of the surface to the mass, that is, the degree of dissociation or dispersion, of a given amount of matter, is a most important factor when considering the state of that matter; but until recently this has been practically disregarded.

There is a gradual transition in passing through the various degrees of dissociation of matter, starting with coarse-grained powders, then passing through powders of increasing fineness of grain, suspensions, slimes, colloids, molecular solutions, ionic solutions, and finally gaseous atoms. Approximate limits may be set for the sizes of the particles in these states by means of filters having different sizes of pores. We have first filter paper, the heavier grades of which hold back grains 0·001 mm. (1μ) in diameter. Next we have the ultra-filter composed of colloidion jellies which contain various proportions of nitrocellulose and the pores of which hold back particles of 0.001 to 0·00001 mm. (1μ to 0·1μ). This is essentially the size of colloidal particles. Below 0·00001 mm. (0·01μ) we come to molecular and ionic solutions which exhibit osmotic pressure, but in which the solute cannot be separated by filtration, though it cannot pass through certain membranes which exhibit selective permeability.

The methods of preparing colloids can be classed under two general heads:

Colloidal Rosin.

1. DISPERSION METHODS, which include dispersion in an organic dispersion medium, cathode dispersion according to Bredig's method and by oscillatory discharges, and dispersion by means of heat.

2. CONDENSATION METHODS, which include chemical reactions (e.g., reduction of metallic salts in solution), electrochemical and photochemical reactions, and polymerization of molecules.

Most of these methods are suitable only for the production of colloidal solutions which have a very great commercial value. There is also the method depending on dispersion by mechanical force, which comes under the first head; but it has not yet been applied commercially, though it would be suitable for operating on an industrial scale.

As a result of an exhaustive investigation of the conditions under which matter could be dispersed to an extent hitherto unattained, a special mill has been devised by Plauson and Block and is being marketed by Emil Passburg, of Berlin, Germany, for the preparation of matter in a colloidal state. In it the material is ground in the presence of water, or other suitable liquid, in such proportions as to have a fluid mass. The grinding element must have a peripheral speed of not less than 2,000 meters a minute, and preferably of about 1,000 meters a second.

The inventors make claims as to the advantages resulting from the use of this method of preparing colloids in the working up of petroleum bearing sludges, the shale oil industry, the extraction of oils from press-cakes, the preparation of resins, the manufacture of colloidal fuel, and many other industries. We shall consider only the preparation and use of colloidal rosin, as this is the application most interesting to the readers of the Pulp and Paper Magazine.

Wilhelm Pollmann, Director of the Rohstoffs-Veredelungs-Gesselschaft m. b. H., at Hamburg, states that the high price of rosin is especially due to the use of volatile solvents, some of which is always lost during recovery. The present methods of preparation are also open to the following criticism, that the crude rosin is first dissolved in alcohol, which is then driven off to give a marketable product, which must again be dissolved when used.

By means of Plauson's process a good yield of purified rosin can be obtained without the use of volatile solvents, simply by emulsifying the crude rosin in water in the presence of only one to 2 per cent of solvent. The colloidal rosin can be used directly for soap-making, papermaking, the preparation of shoe polishes, floor waxes, etc. It is of a dark brown color, and it is either of a sirupy consistency (like water glass) or else it is liquid. The smallness of the particles make it very easily saponifiable, so that there is not much danger of having unsaponified matter left.

Rosin emulsions may be prepared containing as much as 60 per cent colloidal, which is more than can be done with ordinary rosin. Colloidal rosin can be prepared from crude native (German) rosin, and marketed for 6.75 marks a kilo, which is less than the current price for ordinary rosin.

Colloidal rosin is suitable for sizing paper: it increases the strength of wraping papers and at the same time decreases the cost of production.

All this is claimed by Pollmann, who is a director of the company which manufactures colloidal rosin. But there are two sides to every question; and colloidal rosin has not met with universal approval, even in Germany. The *Seifensieder-Zeitung,* in its supplement *Der Chemisch-technische* (No. 8, February 24, 1921), published an article by F. C. Krist, of which we reproduce extracts.

"Mr. Wilhelm Pollmann, director of the Rohstoffs-Veredelungs-Gesselschaft m. b. H., at Hamburg, has recently been spreading in various professional journals certain information concerning a product marketed by his company under the name of colloidal rosin. As such information is likely to deceive manufacturers who ask our advice, we consider it our duty to set the matter in its proper light.

"At my suggestion the *Seifensieder-zeitung* ordered directly from the above-mentioned company a fairly large sample of the rosin, which was subjected to a careful analysis.

"This product, which is credited with all sorts of mysterious and wonderful properties, was found to consist of:

58·64 per cent of water.

2·93 per cent of sodium oxide (Na_2O).

0·63 per cent of inorganic impurities (sand and earth).

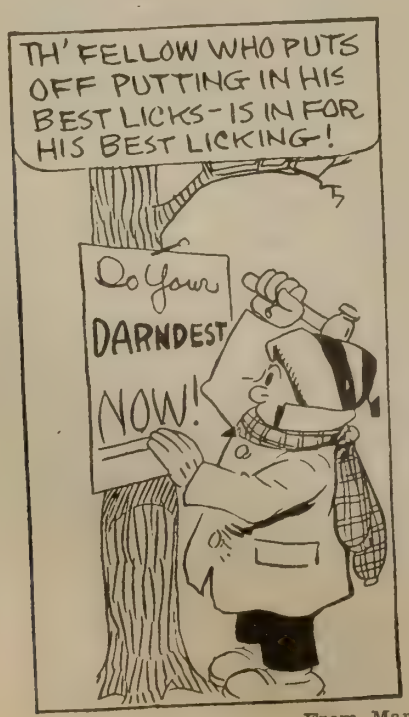
1·44 per cent of organic impurities, insoluble in alcohol. 36.35 per cent of crude rosin.

"After standing for a day, a large proportion of the rosin settles out of this dark, viscous, wretched looking material. It smells of turpentine, and it is evidently prepared (as shown by its analysis) by saponifying crude German rosin with soda ash or with caustic soda. All the impurities which render crude rosin unfit for many uses are still present. But though it is possible in certain cases to utilize crude rosin, after removal of some of the coarser impurities, such is not the case with "colloidal rosin," for the impurities have been partly changed chemically and partly reduced to the colloidal state, and are thus too intimately mixed with the acid rosin soap to allow of their separation.

"Moreover, the company asks (on the 20th of January of this year) 6·75 marks a kilo for this product, which is of doubtful quality. What it is selling at this price is really Elbe river water, and yet Mr. Pollmann emphasizes the special advantages of his product as regards transportation and cost. It is certain that Elbe river water sold in this way is too expensive for the chemical industries. But the most savoury part of the claims is the statement of this excellent business man to the effect that none of the valuable ingredients of the rosin have been lost. This is very true indeed. Nothing has been lost, even the dirt being utilized and improved by means of Elbe river water!

"The product is no more utilizable for soap making than for the manufacture of polishes; and its value for the sizing of paper is very limited."

The above criticism does not reflect on the value of Plauson's method in other instances; but it brings out a very important point, namely, the dispersion to a colloidal state of the impurities as well as of the valuable constituent of the crude material. Quite frequently the separation of the two can be readily effected, and in other cases, as with colloidal rosin, the separation is impossible or very difficult, so that the value of the final product is diminished accordingly.



—From Martin's Papyrus.

USE OF ESPARTO IN PAPER MAKING.

During the European war the scarcity of paper pulp in the Spanish market, caused by the difficulty in securing supplies from the sources formerly relied upon, especially the countries bordering upon the Baltic coast, caused Spanish paper makers to consider the use of esparto to supplement the import supply. Esparto grows throughout extensive districts in the south of Spain, and a poorer quality is found on large areas of poor and sandy lands in Algiers and Tunis. Esparto fiber has been used for centuries in Spain, and the manufacturers of matting, baskets, and cordage exclusively of esparto dates from the time of the Moorish occupation.

Early Experiments in the use of Esparto.

Esparto was used in paper making in Great Britain as early as 1857. The industry met decided success in Scotland and a few years later the manufacture was started in the south of France, the raw materials being obtained from Algiers and Tunis, but it has never reached a prosperous basis in the Republic, due to the inability to compete with the local straw papers. The industry in Spain in the regions bordering on the Mediterranean coast dates from 1869.

The greatest development of the esparto industry is still found in Great Britain, where the fiber has been used for making fine writing paper of great whiteness and to some extent for newsprint, though for the latter purpose at the prices usually current other pulps are cheaper. Papers made from esparto are of great thickness compared to the weight and have the advantage of not shrinking or breaking when exposed to moisture. They have especial adaptability for the manufacture of lithographs. They are easily filled, absorb ink well, and therefore are particularly adapted for fine printing, especially in color work. Esparto paper is highly esteemed for book making because of its texture and light weight.

Though esparto has exceptional qualities for certain uses in paper making, its fibres are not such as will allow its substitution for all the purposes for which pulp is used. The fibres are short and weak. The pulp is best used for filling, and is therefore employed largely in mixtures with longer and stronger fibres. Esparto is not suited for the manufacture of wrapping paper. It can, however, be used in larger proportions than has heretofore been the practice in most other grades, and thus make it possible for the Spanish manufacturers of paper to reduce their demands on the foreign market. In documentary papers and other in which great strength is needed not more than 20 per cent of esparto can be used. In writing papers, where light weight is desirable, esparto pulp can be used in large quantities.

For the cheaper grades, especially those in which incompletely bleached pulp is used, the higher price of esparto will, as a rule, make its substitution for bisulphite pulp impossible.—Commerce Report.

BIG TIMBER SALE IN NOVA SCOTIA.

The sale of 50,000 acres of timber land in Yarmouth and Digby counties by the Fraser Pulp and Paper Company of Scotia Timberland Company, Ltd., was announced recently by Ralph P. Bell, Halifax, who negociated the transaction. Mr. Bell did not state the exact price, but said that several hundred thousand dollars were involved in the sale. The timber tracts sold include all those formerly known as the Dickie & McGrath properties.

Fibre Containers Displacing Wooden Cases

The fiber contained is undoubtedly in process of displacing the wooden case for many uses. Its use has, of recent years, grown by leaps and bounds. What unquestionably led to its more general adoption, as a container for commercial commodities of the most varied kinds, in place of the wooden case was primarily the high cost of the latter, by reasons of the growing shortage of the lumber supply which necessitated that, where possible, a substitute for the wooden case should be used.

For some time, the fibre package naturally had to contend against a certain amount of prejudice and scepticism — that is, at first, usually the fate of inventions which subsequently come to be regarded as the commonplace conveniences of every-day life. In Canada, for example, the railroad companies were for a while, disinclined to accept such packages for transport. It was thought that their use would increase the risk from pilferings and the danger from moisture and so forth. There was also, probably, a lack of confidence as to their possession of the durability requisite to the uses for which many of them were destined. But the manufacturers of such packages were insistent. And, ultimately,



A box-testing machine that gives a box more bumps an hour than it would get in going to England. It proved the value of the fibre box.

the railroad companies agreed to accept them for transport, on condition that they should be of a certain strength and should conform to certain specifications.

As regards the satisfactory qualities of fibre containers as commercial packages, as to durability and so forth, an account of a remarkably severe test, from which this kind of container emerged triumphant, was recently given in "The Paper Container", an English paper box journal. In the test in question, the freight consisted of 100 cases, each case containing 48 cans of Nestle's Condensed Swiss milk, and each of these cans containing 16 ounces of milk. The freight altogether traveled about 5,000 miles, by land and sea. The first stage of its journey consisted of some 1,000 miles of railroad transit, from Cass City, Michigan to Weehawken, New Jersey, whence it was conveyed by a lighter to the Cunard liner, "K. A. Victoria," which sailed from New York to Liverpool. On arrival at Liverpool, the cases were conveyed by rail to London, and forwarded to their various consignees.

With regard to the kind of container used, there were five varieties of the corrugated board cases of the centre special slotted carton type, the first being made with double-faced board having a resistance of 275 pounds to the square inch; the second set were what is known as the double wall or double strength corrugated board, glued together so as to make one piece, the case being fastened with a regular taped corner; the third set represented what is known as the strong box, of double-faced board, with a resistance of 200 lbs. to the square inch, which has an extra double 2-inch fold, giving a triple edge to the case, and ensuring that the contents would not touch the crease of the covering flaps; the fourth set of cases were of the double wall pattern, but with a triple taped corner; and the fifth set were of the 200 pounds test corrugated board, with 175 pounds test liner inside.

When these cases arrived at New York, and were stored in the hold of the "K. A. Victoria", they were all intact. But, on arrival at Liverpool, it was discovered that, for some unexplained reason, the cases had come in contact with a considerable amount of water. But, in spite of this unusual handicap, only three of the cases showed the slightest damage,—one case from the third set (the strong box) being saturated, while the other two damaged cases from the second and fourth sets respectively (the double walled box) had each the taped corner saturated. Altogether, out of the 4,800 cases of milk shipped in these 100 cases, only 48 cans had damaged labels, 38 of which were water-soaked, while there was no other damage of any kind to the cans. It has been stated by a representative of Nestle's firm that considerably more damage has been done to their cases, when shipped in wooden cases and subjected to severe saturation by water.

It would be difficult to obtain a more severe test of the strength of the fibre container than that just mentioned. But this is not the only advantage that the fibre container has over the wooden case. The gross weight of the container used in three of the sets (in the test just mentioned) was 50½ lbs, and of that used in the other two sets 51 lbs. On the other hand, the gross weight of the wooden box, usually employed for this shipment, is 54 lbs. Thus the fibre containers effects a saving in freight. Furthermore, the fibre containers occupied four cubic feet less space per 100 than the wooden cases—another advantage worth noting. Moreover, akin to this advantage is the further one that fibre containers are made in such a form that they can be stored in folded shape, when empty, thus effecting a considerable saving in freight space when they are being shipped.

The fact, too, that the fibre container can be printed at the time of its being made, thus rendering it of great value as an advertising medium, should be an additional incentive to its use in preference to the wooden case. It can be used as a package for commodities of almost every kind. In particular, there seems to be a great future for it as a container for oranges and grape fruit. It is estimated that these fruits can be shipped to the consumers two or three dozen to a package, at a cost of fifty per cent less than under the old system. Fibre containers used for this purpose are sealed and the fruit is pre-cooled and then packed in them. Among the advantages of this method are the high quality of the

fruit due to its pre-cooling, considerably smaller cost to the consumer, and the fact that, being in small units, the packages are more attractive to the buying public; and will tend to cause the sale of oranges and grape fruit by the two or three dozen instead of by smaller quantities.

The fibre container business, and, in fact, the box business of all kinds, is wholly dependent on general trade conditions, and consequently the volume of trade done in these businesses affords a very fair index to the state of general trade. Now, comparatively few manufacturers order their containers far ahead. Hence the first signs of business revival are reflected in the boxes making situation. Consequently it is a good sign that manufacturers of fibre containers are now busying themselves with preparation for doing a big business, and there is reason to believe that, in the country, they will be able to put before prospective customers some very convincing figures.

THE PAPER PACKAGE SELLS GOODS.

A strong, light, cheap, container, easily handled, easily sold, each package containing a known quantity, as well as quality of contents,—a package that guarantees the consumer that it has not been tampered with since it left the manufacturer,—that is what the use of cartons is giving. But that is not all that it is giving. The cartons are printed with attractive designs, and call out, as it were, from the shelves, to the customer as he stands in the store.

The fierce competition in the United States is forcing the manufacturers and large packers to adopt every profitable aid to selling goods. One of the most effective of these aids is the use of attractively printed cartons, or can labels, bottle labels, etc., which are exploited in other forms of advertisement, so that the same device greets the eye on the shelves of the retail store as the customer has seen in newspaper and other forms of advertising. The statue of William Penn, which surmounts the City Hall of Philadelphia, is best known to a hundred million people as the trademark of Quaker Oats. They see the picture of this in the magazines, in the newspapers, on the billboards, and when they go to their groceries, William Penn himself with a royal charter in one hand, and a package of cereal in the other, smiles benignly down from the grocery shelves. It is an easily remembered device, easily recognized, and the trademark on the box reminds the reader of what has been read elsewhere, or said elsewhere, about the greater advantages of Quaker Oats any other kind of oatmeal.

The warm coffee tones of the Yuban coffee advertisement naturally suggest coffee, and their perfect harmony attracts the eye to read the advertisement. The same unusual colors on the grocer's shelves tie up with the advertisement and remind the customer of all those tempting suggestions which he has been reading. He is very apt to end by buying.

There is nothing like paper to keep your goods before the other man's attention, and the paper package, properly correlated with good advertising, **does sell goods.**—The Caravel.

The editor is anxious to be off on that great trip of the Technical Section. If the Garden City Press were not twenty miles from Montreal, where the bunch is gathering, there might not be any issue this week.

"TRIM"

The trim of a paper machine is a most important factor, both for the man who is buying paper and the organization which is making it for him. For the second, it has a close relation to production; and for the other, it may determine whether or not his order is accepted. Trim might be defined as the greatest width of merchantable paper which may be cut from the sheet as it leaves the last calender of the paper machine.

The slitters on the rewinder are the spout through which must be poured all the income producing product of a paper mill. If the spout is narrowed, in other words, if the greatest width possible is not trimmed, the production is decreased in proportion to the reduction in trim. Every inch across the machine costs the same to turn over, whether it is making paper or not. The lost inches increases the cost of the paper that is made; and the loss is paid directly from the margin or gross profit.

For this reason, there is an expressed or implied lower limit to the trim of every paper machine; and the order does not fit between this lower limit and the maximum trim possible must be returned to the customer. It is on this account, that a mill with three machines of varying widths is in a better position to care for all of a customer's wants than a mill with fewer machines. The orders which are sent to the machine must give the greatest trim possible of the best "fill".

Although there may be some variation in this lower limit the upper limit is not so flexible. It is determined at the time the machine itself is built and every care is taken that no mechanical trouble shall cut production from the edge of the sheet. When it is realized that it may be six hundred and fifty feet from the beginning of the sheet to the end of the machine and that this strip of paper more than one-tenth of a mile in length must draw true within a fraction of an inch, the difficulty of the task may be imagined. Including the wire, press rolls, dryers and calendar rolls there are about seventy-five bearing surfaces for the paper, and if one of them is a half inch out of line, it is likely to cut a half inch from the paper which may be trimmed.

There is a tendency to confuse the trim of a paper machine with the width of the machine as given by the maker. The width is measured across the roll and is the width of the wire on the fourdrinier. Most machines are listed in trade directories with this dimension and our Number Three machine, for instance, is given as a 136 inch machine, although it will only trim a little over 124 inches. This shrinkage is lost in three ways, the first being the four or five inches required by the deckle straps or dams which retain the stock on the wire. In the drying of the sheet there is a physical shrinkage which varies with conditions; but which cuts down the trim several inches, and a couple of inches must be cut from the sheet in trimming the rough edges.

The problem of fitting the sizes ordered to a machine was considerably simplified when the duplex sheet cutter was introduced. With the old single cutter, it was necessary that the trim be divided evenly by one dimension of the sheet. Now it is possible to work out better fills by reversing one or more of the sheets so that any combination of the two dimensions which fits the trim of the machine may be used. — The Raripaco Wrapping Paper.

QUOTA.

There is always something worth while in every ouse Organ, sometimes extra good. Here is one bit rom "The Caravel," of the Parsons Trading Co., New ork.

Quota—how many per—is a word we borrow from hat practical, hard-headed folk, the old Romans. When they wanted to get all they could out of a position, all the traffic would bear, yet did not wish to kill the goose that lays the golden egg, they took a careful inventory of just what was what and how far they could go. They took a census of just how many people there were in each place, and who they were, and why they were there. Some of the original enumerations of those censuses have been dug up in recent years, and they show how keen the Roman government was on getting the exact facts. Then they governed accordingly. Not humanely by our standards but better than any of their predecessors, and better than any of their successors until the last few hundred years. They maintained the public credit, a fair degree of peace, and some justice.

Facts, carefully ascertained, classified and correlated, are the only basis for any successful large-scale operations. Conspicuous ability can raise splendid edifices, but can't maintain them without a solid, well-considered foundation.

There must be the facts, and they must be set out in their proper order. It reminds us of a theory that some modern theologians have. They call nothing a miracle that can be rationally explained; and say that when the twelve disciples enquired among the crowd hap-hazard, Who has any provisions? they found only one lad frank and generous enough to tell what he had. But when the Master had the people sit down in groups, and each group was asked, plenty was forthcoming. A man wouldn't have the nerve to pull out his lunch and not share it if his neighbor had heard him say he had nothing to eat. Whether these scholars are right or wrong, there is no question that a setting in order, and methodical examination, will often bring out unguessed resources and opportunities.

How paper can we sell this year? More if we plan for it than if we simply go it blind. Let's see; how much paper can our market buy? The government and other available trade statistics show how much paper, of each class, our market used last year, and the year before that, and so on back to 1910. These figures can be set out opposite each class, and in columns for the various years. At the head of each column, put the population for that year. After each of these columns, put in red ink the quantity of each class of paper per 1,000 of population. There won't be much fluctuation from year to year. We are talking of quantities, not values. There ought to be a steady growth. Now let's put down our own sales of these same classes in the same way. How is our proportion holding up? Are we really gaining? If we are, we can throw out our chest. If we are not, we can see what our quota is, and go to it.

The classified section of the telephone book or the city directory, or the local credit directory will enable us to go over possible customers trade by trade—and is there any trade that does not use paper? Even if they are too small to buy from us, they buy from somebody, and their suppliers ought to be our customers. And the number of them shows us how much those suppliers ought to buy.

The number of accountants and auditors in the directory roughly indicate the extent to which the manufacturing stationers must buy ledger papers.

The actuaries and insurance companies and banks need the best grades of ledger papers. Who supplies them? Are those suppliers our customers?

Are we selling our share of blue-print paper? Do the government offices, Public Works, etc., the architects, contractors, builders, machine builders use Grades 56690 or 56693?

They use drafting manila, tracing paper, tracing cloth, and other drawing papers, too. Their purchases are individually small, but large in the total.

In large cities the bakers use a considerable amount of paper, for pan linings and for wrapping their bread. This is a market for paraffined paper.

The bookbinders of course we have never forgotten. Maybe, though, we have forgotten some of the things we can furnish to them. Binders' boards, from genuine tar-boards down to straw-board; glue, thread; cloth; leather; stitching wire; machinery; ruling colors; marbling colors; gold leaf; marble-paper, etc.

Boot and Shoe factories use box-board, friction glazed, cheap white MF or poster for the flaps inside the boxes, and cheap white or manila tissue to pack in the boxes with the shoes.

Where does the local brewery get its filter paper? And its label paper, and bottle wrapping? And how much do they use?

And so we go on through the alphabet, little by little, not trying to do it all in one day, but jotting down opposite each trade the kinds and quantities of paper they buy.

And then we sell them.

It's not so simple as that. There is much more to the house than the foundation, but the foundation comes first.

We have the facts. We can set ourselves a mark that this month we will sell so many tons—or reams—of such and such a paper. That is our quota. Don't set it so high that there's no chance of making it. Nor so low that there's no fun in beating it. **Because of course we are going to beat it.**

MECHANICAL LEATHERS, LTD.

Mechanical Leathers, Ltd., of 126 Garden Avenue, Toronto, has been appointed Canadian representative of the Chicago Rawhide Manufacturing Company, and will deal in rawhide and krome flat, round and twist belting; belting laces, rawhide gears, pinions and blanks; cups, washers, frictions; mechanical leathers of every description; rawhide hammers, mallets and mauls; club bag and upholstery grains; and other rawhide and specially prepared leather products. The president of Mechanical Leathers, Ltd., which has been recently incorporated, is Mr. Richard W. Coleman, who has charge of the engineering and sales departments, and who was, until recently, with the Chicago Manufacturing Company as belt and sales engineer. Mr. Herbert R. Alley who, after distinguished overseas service, in the course of which he was severely wounded, was called to the bar, but, instead of practising law, joined the sales department of the Goodyear Tire and Rubber Company, of Canada (which concern he left last month, to form Mechanical Leathers, Ltd.) is secretary-treasurer.

THE PAPER INDUSTRY IS REPRESENTED AT WASHINGTON IN CONFERENCE WITH SECRETARY HERBERT HOOVER.

The American Paper and Pulp Association participated in a most important conference with Secretary of Commerce Herbert Hoover at Washington, when the cabinet member called what the newspaper writers termed a conference of the "best minds" of American industry.

The Association was represented by George W. Sisson, Jr., retiring president, W. J. Raybold, the new president, and Dr. Hugh P. Baker, executive secretary. The conference began in the afternoon, and the participants were then invited to dine with the secretary.

The conference was composed chiefly of representatives of industrial associations, and following the afternoon conference, a statement was drafted and signed by those present, for presentation to Secretary Hoover. The statement, made public at the request of Secretary Hoover, is given below.

Trade Associations' View of Department of Commerce.

Foreign governments, always related constructively to business, have, since the war, so expanded such activities as t omake it imperative, in the interests of American industry and commerce if they shall maintain their rightful place in world commerce, for the United States Government to end its assistance and encouragement in a more effective way than heretofore.

The representatives of commerce and industry, who met at your request today, feel that the Department of Commerce can be made to render, to the interests it is supposed to foster and develop, additional aid in keeping pace with their expanding needs.

We therefore welcome the opportunity offered by your suggestion that American business should state itself the character of service which your Department should render and submit the following for your consideration.

Congress had in mind the creation of a broad and effective department, one rivalling the aggressive efficiency of similar departments of competing nations, for in its definition of duties it provided that:

"It shall be the province and duty of said department to foster, promote and develop the foreign and domestic commerce, the mining, manufacturing, shipping and fishery industries of the United States; and to this end it shall be vested with jurisdiction and control of the departments, bureaus, offices and branches of the public service hereinafter specified and with such other powers and duties as may be prescribed by law."

We are satisfied that the Department has never been developed to the scope implied in the act and that to that extent it has fallen short of serving business as we think it should be served by this department of the government.

We desire to express to you our firm and unanimous conviction that the functions of the Department of Commerce shall be so amplified as to meet the purpose of Congress expressed in the definition of the province and duty of the Department above quoted.

It is evident that, to this end, the Department of Commerce should embrace all the non-regulatory bureaus relating directly to industry.

We feel that the whole statistical activities relating to production, stocks, consumption and distribution and movement of the basic commodities at least, excluding agriculture, should be concentrated in the Department of Commerce.

We feel that the basic industries will voluntarily aid your Department in the collection of the vital statistics because the Department of Commerce is, as you have expressed it, a service department to American industry and commerce and that its activities are in no respect to be inquisitorial or regulatory.

We feel that the Department of Commerce, while it is now a real aid to the extension of foreign trade, can and should be expanded to secure the fullest development of our foreign business.

We wish to add that we desire to co-operate with the representatives of other industries and trade associations in the further study of the details of the service which the department can perform.

Since this conference Secretary Hoover has asked Congress for an appropriation of $250,000 to establish twelve industrial divisions, of which paper would be one, to secure information on industrial conditions. He would have two experts from each industry, to alternate between field work and service in the Bureau of Foreign and Domestic Commerce.

U.S. FORESTRY LEGISLATION MAKES PROGRESS.

New York, May 25.—"Now that the Snell bill is in the lower House of Congress, and the McCormick bill in the United States Senate, both based upon the principles of the National Forestry Program Committee, we shall ask for extended hearings on the entire forestry problem by the Committees both of the House and the Senate," said R. S. Kellogg, Chairman of the National Committee, today.

"The program of the National Committee, which is based upon federal leadership and cooperation with the states and forest industries in the maintenance of a permanent timber supply, has already been endorsed by state foresters, state forestry associations and a wide variety of organizations, many of them national trade associations, to a total of 100, and additional support for the program is being reported daily. Many of these organizations will be represented at the Congressional hearings. One group which is particularly active, because of its realization of public interest, is the American Newspaper Publishers Association, and another is the Pittsburg Flood Commission, which favors the Snell-McCormick principle as a means of mitigating the Ohio River floods.

"The American Paper and Pulp Association, parent organization of the paper industry in the United States, has also been leader in the movement, though a consumer of only 3 per cent of the nation's timber cut, because it wishes to maintain its mills in America without dependence upon foreign raw materals. The American Forestry Association, wood using industries, women's clubs and others are working for the cause.

An Indianapolis furniture concern has tried out an experiment shipping furniture in stout fibre containers instead of in the ordinary wooden crate, hoping thereby to reduce freight charges. The initial shipment consisted of a number of chairs protected by fibre board cartons. This test shipment was said to have reached Chicago in good condition, receiving the O.K. of the carrier's agents. Specifications were not made known, but it is expected that the use of this container will be incorporated into shipping rules.

PAPER EXPORTS INCREASED; PULP DECREASED.

In the following table which is just issued by the Dominion Bureau of Statistics on the export trade of the Canadian Pulp and Paper Industry for the month of April, we find, on comparison, that exports of paper were almost exactly $1,000,000 greater in 1921 than in the same month for 1920. Unfortunately, however, this gain is much more than off-set by the loss in exports of pulp for the same time which it will be noted amounts to $1,250,000 roughly. This shows the paper industry in Canada to be relatively in better shape than in the United States, where most of the pulp goes. The value of pulpwood exported is, however, more than double what it was for April last year. This is nothing to brag about because if this wood which brought only about $15 a cord had been manufactured into pulp it would have brought in many more dollars even at the reduced value per ton of chemical and mechanical pulp. It is strange to notice that the price of pulp is not very materially changed. The price of pulpwood, it will be noticed, averages a little more than last year. While the record for pulp shipments is not a very cheerful one, the total for the month of April, 1921, amounts to almost 90 per cent of the trade of this industry a year ago. This, in view of the general business situation, is really not a cause for discouragement.

		Month of April. 1920	1921
Paper—			
Book paper	Cwt.	2,808	6,314
	$	25,302	83,796
Newsprint paper	Cwt.	899,342	949,269
	$	3,827,541	5,241,893
Other paper	$	876,511	405,965
Total paper	$	4,729,354	5,731,654
Wood pulp—			
Sulphate (kraft	Cwt.	163,533	98,103
	$	620,728	424,430
Sulphite, bleached	Cwt.	131,161	40,711
	$	728,669	254,345
Sulphite, unbleached	Cwt.	397,359	98,744
	$	1,587,236	404,380
Chemically prepared	Cwt.	—	—
	$	—	—
Mechanically prepared	Cwt.	198,664	64,070
	$	506,369	131,427
Total Wood Pulp	Cwt.	890,717	301,628
	$	3,443,002	1,214,582
Pulp Wood	Cord	40,433	73,017
	$	420,741	977,537
Country of Destination.			
Paper and manufactures of—			
To United Kingdom	$	344,517	39,267
United States	$	3,730,682	4,952,191
Other Countries	$	654,155	740,196
Wood Pulp—			
To United Kingdom	$	514,568	1,440
United States	$	2,506,825	1,075,418
Other Countries	$	421,609	137,724
Pulp Wood—			
To United Kingdom	$	—	—
United States	$	420,741	977,537
Other Countries	$	—	—
Total paper, wood pulp and pulp wood—			
To United Kingdom	$	859,085	40,707
United States	$	6,658,248	7,005,146
Other Countries	$	1,075,764	877,920
Totals	$	8,593,097	7,923,775

PAPER-MAKING IN OHIO.

Dayton, Ohio, June 9.—"Ohio is recognized as a great steel state. Do you men of Ohio realize that it has more paper mills than either of the great paper-making states of Michigan or Wisconsin, and that its mills were operating before there was a mill in either of these great western states?"

This was the question put to the Dayton Chamber of Commerce, when Dr. Hugh P. Baker, executive secretary of the American Pulp and Paper Association discussed the subject of "The Forest and the Paper Industry of Ohio."

"America's paper industry is in the billion dollar class, the value of its product placing it seventh in the list of American industries, and Ohio has fifty-nine separate mills. The success of any industry is partly dependent upon having its raw material close at hand. You have developed steel mills because you are near the coal and iron mines. And yet with Ohio's great paper industry, largely dependent on imported raw material, millions of acres of land which could be producing timber crops sufficient to operate these mills continuously on native raw material are lying almost idle. This is an economic waste.

"To-day 98 per cent. of the paper manufactured in this country is made wholly or in part from wood. Ohio is rightly classed as a great agricultural as well as a great industrial state, but out of its total of 26 million acres of land, over three million are classed as woodland, and there are over a million and a half acres of waste or idle land.

"If the land area of Ohio which is better suited to the growing of trees than for agricultural crops were covered with the right kind of forests, properly managed, Ohio would be independent of outside sources of wood for her paper industry. This same forest area might be used to supply lumber for home building and industries dependent upon wood.

"As a result of the excellent work being done by the State Department of Forestry at Wooster, and the Forestry Department of the State University, Ohio, for the two year period beginning July 1, will have $10,000 for fire protection, the same for forest nurseries, and $50,000 for the purchase of land for state forests, and $50,000 for the work at the experiment station. It would be a sound investment for the state to put up ten times this amount of $120,000 into the development of forest land, which will pay dividends of millions in raw material for Ohio industries, keeping at home great sums now sent out of the state.

"Your paper mill men are doing their share. The American Paper & Pulp Association is working for national forestry legislation, which involves the giving of federal assistance to states which are properly handling their own forest resources.

"You have the opportunity to make these great fast growing cottonwoods of your river valleys, and your other forest trees a tremendously valuable state asset."

PULP AND PAPER NEWS

Among Toronto business men there is heard considerable commendation of the attitude of the Canadian Manufacturers' Association in session in Quebec in protesting against the action of the Senate in "squelching" the bill for the provision of the much-needed Institute of research, on the ground of economy. It is felt that the Senate's action in this regard was quite uncalled-for and it is hoped that that body will take the hint given to it by Sir George Foster to deal more kindly with the bill next session. The need for the Research Institute is definite and urgent. And it is a highly gratifying circumstance that the Technical Section of the Canadian Pulp and Paper Association has decided to cooperate with the Committee on Industrial Research and to give its support to the creation of the Institute.

Mr. Angus McLean is one of eight to incorporate as Chaleur Hotel, Ltd., with an authorized capital of $150,000 to build and operate a hotel at Bathurst, N.B.

The Canadian Johns-Manville Co., Ltd., with sales offices at Montreal, Toronto, Winnipeg and Vancouver —which for some years has been operating one of the largest asbestos properties in the world, located at Asbestos, P.Q., has placed contracts for a large manufacturing plant to be located at Asbestos, P.Q., where they will manufacture all classes of asbestos products formerly imported from the United States. These products include asbestos paper, asbestos roofings, asbestos shingles, packings, pipe coverings, asbestos textiles, brake band lining etc. Here's a chance for Canadian machinery.

The strike of Toronto printers, pressmen and bookbinders is the principal topic of interest, and interest of a very anxious kind, in pulp and paper circles in Toronto. One very striking feature in connection with this strike is the very general resentment at the men's demands, displayed by commercial and business men, either entirely unconnected or very remotely connected with the industry in question. Everywhere in business quarters, one hears it said that the demand — particularly, perhaps, that for increased wages — are quite unjustifiable. Above all things (so runs the argument in commercial circles generally), economic conditions, at this moment, require that production costs be lowered, whereas the granting of the men's demands would inevitably result in an increase in the cost of production. It must be added that the business slackness, everywhere so unmistakably apparent in Toronto, gives considerable point to criticism of this kind. The Purchasing Agents Association has passed a strong resolution endorsing the action of the employing printers in their resistance to the men's demands.

Last week, a big forest fire at Amherst, Nova Scotia, swept over a large tract of land in the Upper River Hebert district of Cumberland county. The properties burned over are several thousand acres in extent, and are made up, for the most part, of tracts which were badly damaged last year. The fire is said to have had two origins, one from lightning and the other from a saw-mill.

Last week the employees of the Abitibi Pulp and Paper Company, at Iroquois Falls, returned to work after a strike of about a month's duration. It is stated that the men returned to work on the old wage scale, pending an adjustment of a new wage rate.

The problem of getting competent printers for the small towns in Canada is becoming a serious one. At Vancouver recently, at the annual meeting of the Canadian Weekly Newspaper's Association, the president, Mr. W. R. Davies, of Renfrew, Ont., urged the establishment of special printing courses in technical schools in all the Provinces.

The printers' strike in Toronto had its effect on the proceedings of the City Council there. All the reports required for the meeting on Monday were ready; but one report of the Board of Control had to be type-written, instead of being printed. Most of the reports had to be practically cut in two. At one of the big downtown printing establishments, which holds a contract for printing minutes and reports, the manager himself set the type and assisted at the presses.

NOTICE RE DEMURRAGE RATES.

Notice has just been received from the Board of Railway Commissioners, that at their sittings in Ottawa on Tuesday, June 21st, they will hear the following application:

"Application of the Canadian Manufacturers' Association, the Canadian Retail Coal Dealers' Association, the Canadian Pulp and Paper Association, the Hamilton, Chamber of Commerce, the Dominion Millers' Association, the Montreal Board of Trade, the Halifax Board of Trade, the Toronto Board of Trade, the Sherbrooke Board of Trade, et al, requesting the Board to call upon the railway companies and the Canadian Car Demurrage Bureau to show cause why the charges contained in Rule 9 of the Canadian Car Demurrage Rules should not now be reduced to the normal rate of $1.00 per car per day."

The above application was made by the Canadian Pulp and Paper Association, for the reason that a number of the mills had been obliged to pay, during the past six month, heavy demurrage rates on pulpwood and other material which was delivered to them by the Railways in greater quantities than they could unload within the free time limit.

The present high rates were authorized by the Board of Railway Commissioners as a war measure, at a time when empty cars were at a premium and there was grave danger of a serious fuel shortage in Canada. It is felt with the present surplus of cars, the high rates are too great a penalty on the shipping public.

Any mills who have experienced hardships due to the present demurrage rates, should send full particulars at once to the Transportation Department of the Canadian Pulp and Paper Association, Room 1404 Bank of Hamilton Building, Toronto.

UNITED STATES NOTES

Directors of the Bryant Paper Company, Kalamazoo, Mich., at a special meeting last week elected Felix Pagenstecher president, to succeed the late Frank H. Milham, whose death recently in California was noted in last week's issue of the Pulp & Paper Magazine. Mr. Pagenstecher's selection meets with general favor in paper trade circles. In his brief two years' service in the Bryant organization, Mr. Pagenstecher has won the esteem of his associates, and he is held in high regard by all in the trade who know him. He came to the executive staff of the Bryant Paper Company in 1919, serving since as executive assistant to Mr. Milham. He had been previously identified with the Riverview Coated Paper Company which he joined in 1902, at the time of its organization, taking the place as secretary. Under his personal guidance this concern became one of the most prosperous in the Kalamazoo valley district. It grew from a small six coater plant to one boasting of 18 coaters, and in addition operated its own paper mill. When the Riverview Company was merged with the Kalamazoo Paper Company, Mr. Pagenstecher continued as secretary of the consolidated organization. He resigned from this place two years ago to go with the Bryant Company. In a brief period he was advanced to the position of general manager, the post he occupied when death suddenly removed Mr. Milham from his activities.

A manufacturers' power conference, arranged by the Water Power League of America, will be held in New York at the Waldorf-Astoria Hotel, June 21-22. The meeting will be devoted to a discussion of power development, power shortage and fuel supply and costs. George H. Mead, of the Mead Pulp & Paper Company, Dayton, Ohio, is on the advisory council of the League. It is stated in the call sent out by the League that all governments of the world are rushing to completion hydro-electric developments, with the possible exception of the United States; that the utilization of the now unused 50,000,000 water horse-power in the United States would mean a yearly saving of fuel valued at one and a quarter billion dollars, and would release 800,000 men from the labor of mining and transporting coal. Manufacturers are asked to join in a movement to keep this power from being exploited for a few and to use it to supply cheap and constant power.

Mr. Dodge says there has been no change in the paper makers' strike as affecting the International mills, the men refusing to enter into negotiations over the company's proposals for a reduction of about 21 per cent. in wages to that which was in force for the year ended May 1, 1920. The strikers had demanded a ten per cent. increase and a change in working conditions. About 10,000 men are affected.

The census Bureau has just given out figures summarizing pulp and paper-manufacturing activities in the United States in 1919. The data, supplied by 713 establishments engaged in the industry in 1919, with products to the value of $789,548,000, serves as a statement preliminary to the 1920 census of manufactures. Of the total number of establishments listed in the returns, 481 manufactured paper only, 61 wood pulp only and 171 both paper and pulp. The 1914 census showed there were 718 establishments with products valued at $332,147,000. The 1919 production of paper amounted to 6,124,000 tons, valued at $682,043,000, as compared with 5,269,000 tons, valued at $291,588,000, produced in 1914, an increase of 16.2 per cent. in tonnage and 133.9 per cent. in value.

The nomination of Scott C. Bone, Seattle editor, for Governor of Alaska has been confirmed by the Senate. One of the considerations which, it is understood, caused President Harding to make the appointment is Mr. Bone's wide experience with problems of newsprint paper and wood pulp, which industries the present Administration expects to develop extensively from the Alaskan raw materials. Mr. Bone formerly was editor-in-chief of the Seattle "Post-Intelligencer," and for a time was chairman of the Alaska Bureau of the Seattle Chamber of Commerce. While serving in that capacity he made an extensive tour of Alaska.

John H. O'Connell, of the King Paper Company, Kalamazoo, was elected president of the Pulp & Paper Mill Superintendents' Association, at the business session held the closing day of the Convention at the Waldorf-Astoria Hotel, New York, June 4. Other officers elected are the following: George K. Walker, of Finch, Pruyn Company, Glen Falls, N.Y., first vice-president; Nelson R. Davis, of S. D. Warren Company, Cumberland, Maryland, second vice-president, and A. O. Rolfe, of the Champion Coated Paper Company, third vice-president. Peter J. Massey, of the W. F. Hall Printing Company, was chosen treasurer. A professional secretary is to be appointed by the executive committee. The next convention, to be held in Washington, D.C., October, 18 to 23, will be a joint one between the American Pulp & Paper Superintendents' Association and the Technical Association of the Pulp and Paper Industry.

Forest fires in Maine which, at last accounts, were still burning on a large scale in several places, have swept over 20,000 acres in the last month, according to a statement issued last Saturday by the State Forestry Commission. Reports to the Commission indicated that the situation was somewhat improving, although rain is badly needed. 500 cords of peeled pulpwood was destroyed in one fire which swept through three square miles of woodland on Eastern Island. The island is one of a group known as the Wolves, six miles from Grand Manan, N.B.

Edward Hatch, Jr., New York City merchant, has lodged a complaint with the New York State Authorities, in which he directs attention to an alleged pollution of the waters of Lake Champlain through wastes passing into its waters from pulp mills situated in tributary streams. Mr. Hatch charges that the water is being defiled, the fish killed, or their flesh tainted, the rim of the picturesque western shore caked with repellant pasty impurities, and the scenic beauty of this storied body of water destroyed by the sediment swept in from some of the rivers. Mr. Hatch makes it plain that he intends to renew the fight he made eighteen years ago against the mills, which ended, after nearly two years, in a victory for him and a redemption of the freshness and purity of the waters of the lake. He has brought the matter to the attention of Governor Miller in a letter sent last week.

Technical Section

A-15. Test for Uubleached Sulphite and Sulphate Fibers. R. E. LOFTON and M. F. MERRITT, Bureau of Standards, Washington, D.C. **Technical Association Papers,** Series III, No. 1 (Dec. 1, 1920). The difficulties to be overcome in developing a method for distinguishing between unbleached sulphite and sulphate pulps are due to the similarity of the pulps. Since the raw materials from which these pulps are made is in general the same, the only distinguishable difference between the pulps are to be found in the two different digesting processes employed in their manufacture. According to Schwalbe and others there are two differences between them which may be used as a basis on which to develop reactions which will differentiate them—viz.: (1) the difference in the amount of incrusting or ligneous material, and (2) the different chemical changes which have been brought about by the different digesting processes. The various methods proposed by earlier experimenters are reviewed; Klemm's methods (staining with malachite green, and staining with malachite green and then with rosaniline sulphate), Schwalbe's methods (staining with ferric chloride and potassium ferrocyanide, and staining with a copper salt and an organic dye), and Fannon's methods (staining with an aqueous solution of rosaniline sulphate to which is added 1 to 3 per cent of alcohol and enough sulphuric acid to cause the solution to take on a violet shade, and examining either with the unaided eye or with the microscope). The method proposed by the authors consists in staining with malachite green and basic fuchsine (magenta). The stain is prepared from one part of 2 percent aqueous solution of malachite green and two parts of 1 percent aqueous solution of basic fuchsine, and is mixed fresh a short time before using (not over a few hours). Owing to variations in the quality of dyes from various sources, after the stain has been made up it is necessary to test it out on authentic samples of sulphite, and the relative proportions of the two solutions adjusted in consequence. Sulphate fibers should have a blue, or blue-green color, and if any of them appear purple there is too much fuchsine in the mixture and a little more malachite green should be added. All the sulphite fibers should have a purple or pink color, and if any of them show green of blue there is too much malachite green and more fuchsine solution should be added. The method of preparing the sample and applying the stain is as follows: the sample is boiled in water or 0.5 per cent of caustic soda and shaken thoroughly in a test tube. Several fibers are placed on a microscope slide, dried with hard or filter blotting paper, 2 or 3 drops of the compound stain added, the excess removed with hard filter paper after 2 minutes, 3 to 4 drops of dilute hydrochloric acid (1 c.c. concentrated HCl to 1 liter of distilled water) added, the excess removed with filter paper after about 10 to 30 seconds, 3 to 4 drops of distilled water added, and the excess removed. If the excess of stain has not all been removed the washing with water must be continued, otherwise the cover glass may be put on. During the whole of the preceding treatment on the slide, the fibers are continually teased with the needle to insure thorough contact with the various reagents. The color contrast not only enables one to detect the presence of one or both of these fibers, but is sharp enough to enable one, after some practice to make an approximately correct estimate of the percentages of each of the fibers present. Results obtained on several known mixtures by three different analysts with four different makes of American dyes are given. —A.P.-C.

A-16. Acid-resisting Alloys. Can. patent No. 207,477, WILHELM and ROLF BORCHERS, both of Aachen, Germany, Jan. 11, 1921. A process for improving the acid-resisting powers of metals of the iron group, consisting in alloying such metals with 30 to 40 percent of chromium, about 5 percent of another metal of the chromium group, and about 2 percent copper.—A.P.-C.

A-16. Acid-Resisting Alloy. U.S. patent No. 1,354,990, assigned to FOSTER MILLIKEN, Lawrence, N.Y., S. FULLERTON WEAVER and JAMES M. REPPLIER, as trustees, Oct. 5 1920. **Chem. Met. Eng.,** xxiii, 988 (Nov. 17, 1920). An acid-resistant and high temperature resistant alloy consisting of iron, 16 to 20 per cent; chromium, 5 to 7 per cent; copper, 31 to 38 per cent; nickel, 38 to 46 per cent; and manganese, 0.25 to 0.75 per cent.—A. P.-C.

B-2. Logged-Over Land Problem. Timberman, December, 1920. Discusses problems incident to the clearing of logged-off lands of Western Washington and their settlement by farmers. Results of conference held at Seattle, Wash., December 6 and 7, 1920.—C.L.

B-3. What Wireless Telephony Means to Canadian Lumbermen. DOUGLAS P. COATES, **Canada Lumberman,** March 15, 1921.—C.L.

B-4. Economic Importance of Jack Pine in the Pulp and Paper Industry. T. K. DICKINSON, **Canada Lumberman,** February 15, 1921. Emphasizes the availability of jack pine for newsprint manufacture and the large supplies of this timber available. "It is now an established fact that jack pine cooked alone will make a newsprint product equal to the best that has been coming from the Canadian mills."—C.L.

B-4. Research Facilities for Lumberman. Canada Lumberman, February 15, 1921. Advocates the establishment of a Division of Lumber in the Forest Products Laboratories of Canada. There are many problems which require solution but for which the existing staff of the laboratory is inadequate.—C.L.

B-5. Logging Hook. Can. patent No. 207,385, JOHN HYDE, Vancouver, B.C., Canada, Jan. 11, 1921.—A.P.-C.

B-9. Work of the Quebec Forest Service. G. C. PICHE. **Canada Lumberman,** March 15, 1921. The timber cut in Quebec on private lands is now almost as great as on crown lands. Crown timber revenue for fiscal year ending June 30, 1921, will, it is predicted, reach $3,500,000. Forecasts closer regulation of cutting operations by government foresters. Need for an extensive program of reforestation and for increased efficiency in forest protection.—C.L.

B-9. State Legislation and Policy. C. S. CHAPMAN, **Timberman,** December, 1920. Suggests policies of legislation applicable to the States of the Pacific Northwest, in connection with forest protection and forest management.—C.L.

B-9. Summary of the Lumber Situation and Outlook for 1921. Canada Lumberman, March 15, 1921.—C.L.

B-9. Statistical Survey of the Lumber Industry of Canada for Calendar Year, 1919. Canada Lumberman, March 15, 1921. Summarized from report of the Dominion Bureau of Statistics.—C.L.

B-9. Halt must be Called on Export of Pulpwood. FRANK J. D. BARNJUM, **Canada Lumberman,** March, 1, 1921. Advocates restrictions on the export of pulpwood cut from privately owned lands in Canada, in view of rapidly diminishing supplies of Canadian pulpwoods. Emphasizes heavy damage by fires and by insects and need for greater conservation of our forests. —C.L.

B-0. Report of Annual Meeting of Western Forestry and Conservation Association, held at Spokane, Wash., December, 6 to 8, 1920, **Timberman,** December, 1920. Discussion of national forest policy for the United States, reforestation, forest fire prevention, income tax situation, airplane control, and wireless telephone.—C.L.

B-0. Storm Damage to Olympic Peninsula Timber. Timberman, February 21, 1921. Very heavy damage done by windfall in the Olympic Peninsula of Washington and in southern Vancouver Island during the storm of January 29. Only a comparatively small percentage of this timber can be salvaged, and the fire hazard will be tremendously increased for a great many years to come. See also article by A. L. TICKNER, **Timberman,** March, 1921.—C.L.

B-0. Sweden as Source of Wood Goods. H. M. MELONEY, **Timberman,** March, 1921. In Sweden the large timber owning companies operate their own sawmills and pulp mills and employ an efficient corps of trained foresters who are in complete control of the vast timber holdings. Only selection cuttings and thinnings are permitted. The amount of cut is limited by law. In the manufacture of matches, aspen has previously been used largely, but owing to the depletion of supplies, substitutes have had to be found, of which birch is one of the most important. The Swedish people thoroughly appreciate their forest assets, and in this feature may be found the correct reason for the importance of their country throughout the world as a producer of wood goods.—C.L.

B-0. Forestry—When and Where. HOWARD R. FLINT, U.S. Forest Service, **Timberman,** March, 1921. —C.L.

B-0. Timber Gives Permanency to Many Activities. ROBSON BLACK, **Canada Lumberman,** March 1, 1921. —C.L.

E-5. McKee's New Sulphite Pulp Process. Can. patent No. 207,307, RALPH H. McKEE, New York, N.Y., U.S.A., Jan. 11, 1921. The process of producing paper pulp from resin-containing wood which consists in placing the wood in a sulphite digester, subjecting it to the action of liquid sulphur dioxide at an elevated temperature and at a super-atmospheric pressure, removing the main portion of the sulphur dioxide from the digester, adding sulphite liquid and subjecting the treated wood to the sulphite cooking process whereby paper pulp is produced therefrom.—A.P.-C.

E-5. Dilute Sulphuric Acid Preliminary to Sulphite Cooking. Can. patent No. 207,319, EMILE BRONNERT, Mulhouse, Alsace-Lorraine, France, Jan. 11, 1921. A process for the production of high percentage sulphite cellulose, characterized by the fact that under low pressure an opening up of the material by boiling with diluted, say 1 percent, sulphuric acid, is allowed to precede the usual boiling of the already prepared wood material with calcium bisulphite or magnesium calcium sulphite liquor under pressure.—A.P.-C.

F-4. Method of Concentrating Solutions. Can. patent No. 207,431, EDWARD SHAW, Toronto, Ontario, Canada, Jan. 11, 1921. The method of concentrating solutions which consists of continuously heating a solution under pressure sufficient to prevent steam formation, and exploding the solution in a separating chamber below the water level in the chamber.—A.P.-C.

F-4. Evaporating Process. Can. patent No. 207,481, AKTIEBOLAGET INDUNSTARE, assignee of NILS OLOF SODERLUND, both of Goteborg, Sweden, Jan. 11, 1921. An evaporating apparatus which comprises a chamber having an inlet and an outlet for a heating gaseous medium, means for introducing a heated gaseous medium in said chamber through said inlet, means for spraying the solution to be evaporated into said chamber, and a partition wall within said chamber inlet and outlet to cause the gaseous medium to travel through said chamber in the direction of movement of the sprayed solution.—A.P.-C.

G-8. Press Roll for Pulp. Can. patent No. 207,482, The Aktiebolaget Karlstads Mekaniska Verkstad, assignee of RUDOLF ERNEST WAGNER, both of Karlstad, Sweden, Jan, 11, 1921. A press roll for pressing woodpulp, cellulose and the like, provided with surface grooves the width of which is less than 1 mm. and the depth of which is such that material pressed into the grooves will become pressed by the bottoms of the grooves, said grooves being located at such distances from one another that the width of the portion of the cylindrical surface of the roller remaining between two adjacent grooves is at least equal to the width of the groove.—A.P.-C.

G-0. Electroosmotic Extraction of Water. Can. patent No. 207,561, GESELLSCHAFT fur ELEKTROOSMOSE, m.b.h., assignee of GRAF MOTHO SCHWERIN, both of Frankfort, a/M, Germany, Jan. 11, 1921. A process of extracting water from animal, vegetable, or mineral substances by electroosmotic action wherein the material to be freed from water is subjected to the action of an electric current in a space of constant volume containing the electrodes under pressure or suction exerted or transmitted by the material itself and without any movement of the drying matter. —A.P.-C.

K-6. The Manufacture of Waste Paper. Pappen-und Holzstoff-Zeitung (Nov. 25 and Dec. 2, 1920); **Pulp and Paper,** xix, 36 (Jan. 13, 1921). A rather brief description of certain machines and processes for the reclaiming of waste papers. (German patents No. 230,021; 316,469; 312,618).—A.P.-C.

K-10. Paper Size. Canadian patent No. 207,095, JUDSON A. DECEW, Montreal, Que., Canada, Jan. 4, 1921. A process of making sizing solutions which consists in diluting a resin soap containing over 25 per cent of free resin and then discharging it into a cold solution of sodium silicate until the total dilution is approximately 2 per cent total solids.—A. P.-C.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, June 11th.—Although satisfaction is felt that work has been resumed in the mills of Price Bros. and Abitibi, the past week has been an unsatisfactory one for the industry, to a large extent. The continuance of the strike among the printers in Toronto had naturally had a depressing effect and has resulted in a decrease of business. Moreover, it would be unwise to predict an early settlement of the strike. The employing printers, in spite of the fact that some shops (chiefly those which either employ but one or two printers or else are non competitive) have signed an agreement with the Typographical Union, express themselves as well satisfied with the way in which the situation is being handled by their organization, the Toronto Typothetae. The number of compositors, pressmen and bookbinders at work in their shops is increasing daily, old employees who had quit work are coming to their assistance, and they have put into effect a plan to train men and women to take the place of the strikers, and are expediting arrangements for establishing a school for apprentices in type setting. On the other hand, the Strike Committee of the Typographical Union appears confident of its ability to defeat the employers, and announces itself as being in receipt of messages from other towns and cities asking for instruction as to whether work sent thither from Toronto should be done.

PULP.—The pulp situation, according to the representative of one of the big pulp mills whose opinion was asked on the point, has recently shown some improvement. That improvement, he went on to say, is likely to be more substantial when the printers' strike is settled. At present, the demand is of a too spasmodic kind to occasion much satisfaction. He gave the following prices as obtaining at the moment: No. 1 bleached sulphite 6½ cents a lb.; easy bleaching, $80 a ton; new grade sulphite, around $70 a ton; and groundwood, about $30 a ton. These prices are all at the mill. Stocks in the hands of the mills and jobbers are being reduced, but the process of reduction is slow and is likely to continue so—at all events, until the conclusion of the printers' strike which is detrimentally affecting the sale of pulp.

PULPWOOD.—The cut has been a good one. Practically, all the wood has been contracted for, and most of the mills will take the wood at the contract prices.

BOOK PAPER—At once depressed and unsettled is the condition of the book market and that of bonds and ledgers. Here, again, the printers' strike has meant a lessening of business. In practically all lines, too, there is a lack of fixity of prices. The mills need orders and the jobbers are buying little. Moreover, the consumers are displaying an extraordinary economy. They are waiting for prices to come down, although, on the other hand, one hears it said, in some quarters, that the bottom of the market has already been reached. Certainly the consumer has reason to be economical if the price of $18 for 2,000 letter-heads, which the writer heard of as being lately charged to one consumer, be a fair criterion. Even that price, however, did not show any extraordinary profit to the firm charging it. Wholesalers, retailers and printers alike seem all to be keeping stocks down to the minimum. They are just drifting along—"living from hand to mouth", as the informant just quoted described the situation.

WASTE PAPERS.—There has been a certain amount of buying in certain lines of waste papers during the past week. For example, there has been a little business done in No. 1 Kraft papers and the better grades of white shavings. But in the cheaper grades of waste papers there is nothing doing. In fact, generally things are about as dull as they can be.

WRAPPING PAPER. The retail trade has shown some signs of picking up a little bit this last week. But the jobbers show no increased inclination to stock up. They complain that the business they are doing is very light, and the same complaint is heard from the manufacturers, in their turn. The demand is still away below what it ought to be, and, at the moment, there seems no early prospect of a substantial revival.

BOX BOARD.—There has been no recent change in board prices. The demand this week is reported to have been fairly good. But there is an idea that it is too "spotty" to justify much optimism. However, the general tone undoubtedly looks slightly better. Things are quiet but it is possible to keep the machinery going three or four days a week. The trouble is that no large deals whatever are being closed. Buyers are purchasing only from hand to mouth. When an order that should be for 500,000 boxes or so does come along, it will be an order for only 20,000 or 30,000. The manufacturer is not given a fair chance.

GREASEPROOF AND GLASSINE. — In these two lines of paper, there have been no recent changes in price. In both there is very little business doing.

TOILETS AND TISSUES.—There is a fairly good tone to the trade in these papers, taking the general depression in the paper trade into consideration. A fair amount of business is reported as having been done by the mills.

NEW YORK MARKETS.

New York, June 11 — (Special Correspondence). — Indications are accumulating that trade in paper is slowly but surely expanding. Taking all the reports received, it appears that a fairly good business has been done in the local market this week, and while it is plainly apparent that consumers in most instances are buying only against immediate wants, it is equally as apparent that demand is gradually broadening and that the movement of practically all kinds of paper is certainly quickening.

There have been quite a few important price changes noted within the past several days. Following the lead of the Canadian Export Paper Company in reducing its contract price on newsprint to 4.75 cents per pound, a reduction of three-quarters of a cent, the International Paper Company early this week announced a cut in its price on newsprint in standard rolls to contract customers over the third quarter of the year to the same basis. The new schedule is still $5 per ton above the first quarter of 1920, but the



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new price is generally considered very fair, not alone among paper men but by publishers as well. Commenting on the reduction, President Philip T. Dodge of the International Paper Company, said that the action was taken despite the fact that the cost of production for the third quarter of the year would be higher than that of the second quarter, and that the purpose was mainly to conform with the readjustment going on in business in general. Not only will the cost of labor continue high, according to present indications, said Mr. Dodge, but the cost of materials are high, for the International is consuming products contracted for at the peak of prices, being forced to contract for supplies, particularly of pulp wood, from eighteen to twenty months before they are used.

The newsprint market generally displays a steady tone. There is a growing demand for paper and pubishers are not so cautious in buying as they have been in recent months, presumably figuring that prices are about as low as they are likely to be for a time and also probably feeling that newsprint will become scarce if the strike at mills is not soon settled. There has been no agreement reached by most of the large producing mills with their striking workmen as yet. The International Paper Company's offer providing for a settlement of the wage dispute on the basis of an average wage reduction of 21 per cent instead of 30 per cent as originally proposed by that company, has not been accepted thus far, and only in one or two cases have the strikers returned to work.

One of the largest manufacturers of kraft wrapping paper in the States announced a reduction in price on kraft of a full cent per pound several days ago, bringing the quotation of this company on No. 1 kraft wrapping down to 7 cents a pound at the mill. Other producers who had been quoting close to 7 cents promptly lowered their prices to around 6.50 cents, so that prices on No. 1 kraft wrapping now range from 6.50 to 7 cents.

Book papers are a trifle easier in price. Offerings of machine finished book by certain mills have been reported at 6.50 cents per pound, and instances have been cited where jobbers have sold small lots of this kind of paper at even lower figures, of course taking a financial loss in such transactions. Most of the demands for book papers is coming from publishing houses. Printers are doing very little buying of any consequence, and it is easy to be seen that matters in the job printing trade are anything but lively.

The board situation continues to improve. There are more orders of carload dimensions being placed today than in a long time, and mills are securing such an increase in business that they are becoming decidedly firmer in their attitude regarding quotations. Plain chip board can still be bought at $30 per ton f.o.b. mills, and in some out of the way cases at slightly less than this figure, yet a majority of manufacturers are now quoting close to $35 and are growing increasingly insistent on obtaining this price. Filled news board is selling at $32.50 to $37.50 per ton, with most producers asking the higher figure.

The improvement in box boards seems to be largely a psychological affair. Paper box manufacturers have been confining their purchasing of board so long to small quantities as immediately required that many of them, seeing prices commence to strengthen in spite of the light demand, have resumed buying in carload lots, with the result demand has broadened considerably. At the same time, there has been no large expansion of operations in the paper box trade. There is a fairly good demand for boxes, but evidently hardly enough to warrant the sharp spurt in demand for boards.

GROUND WOOD. — The ground wood market rules steady in tone but displays little feature. There is a moderate call for supplies from consuming quarters and yet few of the sales recorded today involve large tonnage because consumers are absorbing only such pulp as is directly needed. Indications are that there is a smaller surplus supply in grinders' hands than formerly, and this factor has its influence in keeping prices firm. Spruce ground wood of prime quality is selling on an average at around $38 per ton delivered at consuming points, which is equivalent to approximately $30, on an average, at producing mills in the States and slightly under this at Canadian grinding plants.

CHEMICAL PULP. — There is little change in chemical wood pulp. Prices as a rule show a downward tendency, and it is really apparent that most of the buying now being engaged in is at the low level of quotational ranges, yet manufacturers of pulp generally name about the same prices as before. Probably the strongest item in the market at present is news grade sulphite, which is held by a majority of producers at $75 per ton or higher at pulp plants, and which is meeting with a comparatively good demand. Prices on bleached sulphite continue slightly uncertain. Several large producers are asking 6.50 cents at pulp mills for No. 1 bleached, yet it is difficult to see how they are managing to secure this price when bleached sulphite is offered in other quar-

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Paramine Brown M.
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Paramine Green G.
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ters at less than 6 cents, with reports heard of some grades of bleached available down to 5 cents. Buyers show a disposition not to pay above 4 cents for domestic easy bleaching sulphite, nor more than 5 cents for soda pulp, and it is understood that most of the spot market business passing in these grades are at around these prices.

Importers report little activity in foreign wood pulp. Paper manufacturers are buying only when necessity forces them to, and are even then taking but small quantities. Pulp sales consist chiefly of spot stocks on this side, there being few orders placed for shipment from primary sources.

RAGS. — Roofing rags are sought in increasing volume and this end of the papermaking rag market is in a fair way toward a return to normal activity. No. 1 roofing stock is freely bringing 90 cents per hundred and up to one cent per pound f.o.b. New York, while numerous sales of No. 2 roofing are reported at a price basis of between 70 and 80 cents a hundred pounds. The larger movement of roofing is having a sentimental influence on the higher qualities of rags, because dealers in general look for other grades to follow the uptrend in satinets. Demand, however, for most other grades is light and prices have changed but little, if any. No. 1 repacked old whites are offered at 5.25 to 5.50 cents per pound at shipping points, and No. 2 repacked at around 3.25 cents, while old repacked thirds and blues are available to mills at 1.75 to 2 cents. Reports have been heard of transactions in No. 1 white shirt cuttings at as low as 9 cents a pound New York, although dealers mostly ask better than this figure. New cuttings as a class of rags are in very limited demand.

PAPER STOCK—Quite a run of demand continues on several kinds of old paper, and these descriptions are fetching fancy prices in comparison with other grades which are not in so much demand. Old kraft is in particularly good call, and it seems doubtful that dealers in New York would accept mill orders at 2 cents a pound f.o.b. this city because of the difficulty in locating this material. Asking prices now range at around 2·25 cents, and there is but little kraft paper offered at this basis. White news cuttings are held with firmness at 1·65 to 1·75 cents per pound at shiping points, and old books and magazines are gradually strengthening in price, with about $1 per hundred pounds the average quoted at present. Old No. 1 mixed paper is moving in fair quantity at 30 cents per hundred f.o.b. New York, but folded newspapers are provided with a narrow mill outlet, because board manufacturers evidently are running mainly on chip board, and are freely available at 40 cents New York.

OLD ROPE AND BAGGING—Old rope holds quotably steady at 4 cents per pound for No. 1 manila and is moving in a routine way into consuming channels. Old bagging is in a dull market position and prices are largely nominal.

ANNOUNCEMENT.

Leslie H. Allen, who has recently been with Fred. T. Ley and Co. contractors of Springfield, Mass., first as an industrial housing engineer and then as sales manager for New England territory, has joined the staff of the Portland Cement Association, 111 West Washington Street, Chicago, as Assistant Manager of the Cement Products Bureau. Prior to joining the Ley organization, Mr. Allen was for 12 years with the Aberthaw Construction Co. of Boston.

THE SILENT SALESMAN'S "APPROACH."

What clothes are to a salesman, the envelope is to a letter or circular. Actual tests have proved that an attractive envelope of sufficiently good quality paves the way for a more favorable reception of the message which it contains. The envelope is the "approach" of the printed salesman.

"But why give much thought to the envelope?" some advertisers object. "Mail sent to big offices is opened before it reaches a buyer or executive. He never sees the envelope and we don't care what impression it makes on the office boy who opens it. The man in the small office or store opens and reads all the mail he receives, regardless of what sort of envelope it comes in, so why waste efforts on well-prepared designs for him?"

Such an argument is about as logical as sending out a salesman poorly dressed on the theory that the big buyers probably won't see him anyway, and the smaller men won't care how he's dressed.

An envelope's first requisite is strength — strength sufficient to protect its contents during transit through the mails and insure their reaching their destination in good condition.

But a very important *secondly* is — attractive appearance. This does not necessarily mean an elaborate four or five-color cut, costly hand-lettering, etc., to replace the familiar corner card. The outside of the envelope should be in harmony with its contents. If these contents consist of a sales letter or advertising literature, the selling talk elaborated in the letter or booklet should begin on the envelope itself — it should prepare the prospect's mind for what is to follow, and put him in a buying mood.

The printer who educates his customers to the advertising possibilities of the envelope is not only giving better service but is building more business for himself. Intelligent service, through better printing and sales-making suggestions, will lift a printer out of the price-competition class. Like Emerson's man who built a better mouse-trap, buyers "will beat a path to his door".

Because of their advertising value, envelopes are becoming an increasingly important factor in Canada's business life. Fully aware of this, Canadian envelope manufacturers in every large city of the Dominion carry large stocks of standard size envelopes for immediate delivery, and are always ready to furnish special sizes to order, made of any stock desired. With Canadian manufacturers thus prepared to meet all requirements, the buying of envelopes from foreign makers is a useless and costly practice. Yet, in the year ending March, 1920, over *fifty million* envelopes were imported into Canada!

This is one more example of the unnecessary imports which are keeping the Canadian dollar below par and reducing the number of printing orders by lessening employment in Canadian industries.

It is a condition which printers can do much to remedy by running every job on Canadian-made paper. Help to stop this unnecessary importation of foreign goods by ordering envelopes made of Canadian stock by Canadian manufacturers.

It isn't a good plan to allow your regrets for yesterday to overshadow your hopes for tomorrow.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., June 23rd, 1921. No. 25

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

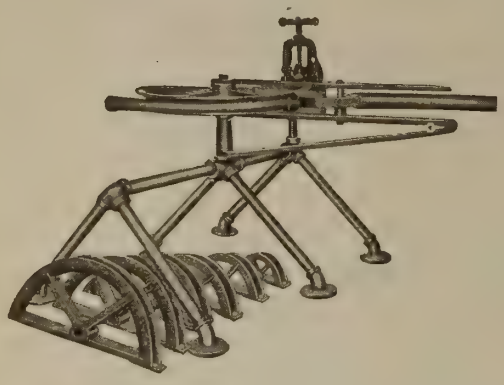
J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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Changes of advertisements should be in the Publishers' hands ten days before the date of issue.

Pipe Tools That Save Time in Pulp Mills



When piping is being renewed in your plant, the **Wonder Pipe Bender** will save the use of many fittings. It bends a 2-inch pipe to an angle of 90 degrees in less than a minute, thereby reducing the number of fittings to be kept in stock. Besides being a time-saver, the efficiency of your pipe line is increased because the bend offers no obstruction and reduces the usual friction in the pipe-line. The Wonder Pipe Bender is a necessity as it quickly pays for itself in time and fittings saved.

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We can also supply all kinds of pipe-threading tools and pipe benders.

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EDITORIAL

UP IN THE AIR.

While "the band played on" at the Laurentide Inn last Thursday evening, one of the hydroplanes of the Laurentide Forestry Department could be seen gracefully circling about in the air above. It is not so many years ago since Langley's pioneer experiments and the successful work of the Wright Brothers. Flying is an everyday event now and an aeroplane overhead attracts scarcely more attention than a passing automobile. It is certainly less dangerous to the pedestrian. The Great War occasioned great progress in the employment of the flying machine. Since the war ended, many opportunities for using the airplane in peaceful pursuits have been found—from handling mail to smuggling booze. But the most important and promising application, as far as the pulp and paper industry is concerned, is the forest protection and surveying. The use of airplanes and flying boats for these purposes is well beyond the experimental stages. Trials in California, British Columbia and Quebec have established the feasibility of airplane surveys and fire inspection.

Federal and Provincial Governments receive a large proportion of their revenue from the forest, but, in comparison with other countries in like position, notably Sweden, the expenditure for protection and reproduction of the forest is pitiably small and niggardly. Even the Province of Quebec, which is admittedly the leader on this continent, in such matters, spends on the forests only 10 per cent of the revenue they produce, while Sweden re-invests 50 per cent of the income from this source.

The more extensive use of aeroplanes should be immediate and general. There are yet four months of good flying weather, and we are sadly in need of information which can be gathered by aeral observation. Our forests are very inadequately mapped, both as to location, extent, kind, and condition. With this basic information properly mapped, an inventory, at least annually, is imperatively needed to know even approximately where we stand as to the balance in our woodland bank. That is our principal national resource, next, perhaps, to our water powers, and these powers will surely disappear if our forests are not protected.

A dispatch from Ottawa states that a number of lighter-than-air machines are available for demonstration, and firms interested in forestry and fire protection are offered the loan of them. It seems to us that the burden of experimenting is being placed too heavily on private enterprise, when it is a matter of concern and benefit to the whole community. Such work should be undertaken by the Province, and extra support, if needed, obtained from all companies alike, by higher stumpage. Freehold land owners could be reached by an assessment for protection, and the foreign buyer of freehold wood could be made to contribute to the protection of the forest from which his supply is obtained by having an export tax.

A number of pulp and paper companies already have hydroplanes in use. The provinces should be more active along this line. There is hardly a more appropriate use for the aeroplane. Its use is essential in any efficient scheme for the protection of the forest.

A recent movement that will greatly help in this direction is the formation of the Commercial Air Pilots' Association of Canada, the secretary of which recently wrote as follows to the President of the Canadian Pulp and Paper Association:

Dear Sir,—We believe you will be interested in knowing that our association, comprising a large majority of the active commercial Air Pilots of Canada, has recently come into existence for the express purpose of elevating the standard of requirements of commercial aviation both from an equipment and personnel point of view. To quote an extract from our constitution:

"The association is to try to uphold a high standard of efficiency and professional conduct so that the fact that a pilot is a member of the Association will be a guarantee of his professional ability."

It has come to the attention of a number of our members that certain pulp and paper interests have suffered severe losses during the past season, due mainly to the numerous accidents to aircraft. It is our aim to keep repetitions of such occurrences at a minimum by first making absolutely certain that a pilot holding membership in this association is qualified for commercial work, and second, by asking the co-operation of the industries making use of aircraft, to the extent of making application to this association when in need of commercial pilots.

There are three classes of membership in the association:

1.—Senior Member; one holding a commercial pilot's certificate issued by the government, and having had at least one season's actual experience in commercial aviation.

2.—Junior Member; one holding a commercial pilot's certificate issued by the government, but who has not had one season's experience in commercial aviation.

3.—Associate Member; a Senior member who has ceased flying for a period exceeding twelve months.

We believe you will at once recognize the importance and value of such an association and we ask your assistance and co-operation and invite your enquiries.

The pulp and paper industry will be interested in the Air Pilots' Association, and the more interested the better for the industry.

COBWEBS.

At last, there seems to be an awakening to the need of public and official action in the fight for health. Health is the biggest asset of the individual and so of the community. A sick person is a burden on the community. Medical expense is generally a waste because it can be prevented by care. The Department of Health at Ottawa has begun an energetic campaign against venereal disease, infant mortality, and tuberculosis. It is primarily a problem in education. Pamphlets and posters on the first subject, in both French and English have been received. Every mill should get in touch with the Department and help the good work along. The fight on infant mortality and tuberculosis requires both education and income, since poverty plays a great part. A sufficient wage and fair rent will help a lot. Most paper mill towns would show good records in both these items.

An Ontario settler will know better next time and perhaps a few others will learn from his experience. He set a fire which eventually destroyed half a million feet of pine timber. The Sudbury Police Court sentenced him to a month in jail at hard labor. That is very good news. A few more convictions with jail sentences would teach people it is a crime to burn timber. Permits for burning slash under proper supervision, can be had for the asking.

A friend in England writes: Things are dull here—dead. The coal miners are out now, the Textile workers have joined them, and the engineering employees may follow suit any day. Things are very critical—and close on £35,000,000 spent on unemployment. There is no other country in the world so philanthropic!—and so upside-down.

An Edisonian question for "Techsecters": Why cannot what liquid be kept how long in what kind of a cup?

We don't understand why the special cars were necessary when there were two Busses belonging to the Technical Section.

"NOT INCLUDED IN THE PROGRAM."

Gus Arbo was heard softly playing "Sahara" at Grand'Mere, thinking no doubt of Hawkesbury.....

A. O. Bowness was in rare form and thinks if he could be allowed to make Tissue on Laurentide's machine he could make paper at 1,500 feet a minute.

Charlie Buss was on deck at all hours, day or night.

"Doc" Bates was another welcome guest. He has considerable skill at "golluff."

Ross Campbell makes a great delegate; here, there, and everywhere. Two others of the same clan sat down dinner—F. J. & "Lew".

Ed. Wardle was heard to ask the Band to play, The Campbells are coming.

George Carruthers is inimitable, and "by Jove" he can say "Begorra" better than any Scotchman.

George has a story for every occasion and is at his best when most needed. He handled the Laurentide Dinner to the King's taste.

Costigane was on the job all the time looking for holes to fall into and cogs to get caught in.

Messrs. Dewar & Walker are still going strong.

Crossley is an old timer when it comes to Laurentide; he was there when they used water to wash with, not to make electricity.

Fire-Chief Berthiaume made a great hit with the boys, and as a press-agent for Trois Rivieres would be hard to beat.

Jentz. King and O'Reilly were the Three Graces of the party. They did'nt overlook a single bet.

It is rumored that George Carruthers is now taking French lessons. So that he can start his speech, "Messieurs et Mesdames."

Lafrance is in Mlle. Lenglen's class when it comes to tennis.

Tom Nuttall made a hit with the crowd.

Editor Stephenson was the only man in the trip that did any work. He was observed bullying Bryson Millidge and Grindstad into checking some parts of the Text Books. However Steve has made up his mind to have those Text Books ready.

P. B. Wilson made his first official visit to the St. Maurice Valley as President of the Association. A compliment that the Technical Section appreciates and will remember. The exchange of wit between P. B. and Geo. Carruthers was a case of diamond cutting "cairngorm".

Did any of the members see the look of anguish on Orville Bryant's face as he searched for cold soda water?

The waste liquor problem has now been definitely settled by the Quebec Commission.

Kellogg must be raised in Battle Creek. He climbed hills, played tennis, swam, ran races, and was fresh as a daisy all the time.

NOTE:—The Editor did **not** write these notes.

Writing Manilla is just the stock for Production order forms. Strength is a requisite, for Production Orders are handled over and over in the various shops before they finally reach the cost department for entry in the books.

A Student Apprentice in a Paper Mill*

By A. B. COPPING, Winner of the Essay Contest of the Technical Section.

Explanatory Note.

It having been decided by the management of the Brompton Pulp and Paper Company to carry on a series of investigations on various processes and operations practised at their mills at East Angus and Bromptonville, six students were taken on the strength of the Technical Service Department in addition to the regular staff. This party was under the direct supervision of the head of the Department, and its work was guided primarily by a committee consisting of the Assistant Manager, the Technical Service Head, Groundwood Superintendent, News Superintendent and two of the students. This Committee acted only in an advisory capacity and practically all of the details of the tests were left to the party itself.

A Tour of the St. Maurice Valley.

The writer, before coming to the Brompton Mills, was sent on a tour of inspection, investigation and instruction to the St. Maurice Valley Mills, especially with a view to becoming acquainted with the operation and installation of Voith Magazine Grinders—these are used to the exclusion of all other types at the Laurentide Mills. At the mills of the Belgo-Canadian Company an exceedingly good system of technical control was noted, and much help was obtained at the St. Maurice Paper Company at Three Rivers. An unsuccessful attempt was made to visit the plant of the Wayagamack, where, it is understood an excellent system of technical control is in operation.

Work to be Accomplished.

The work done during the Summer may be divided as follows:—

(1) Investigation of the existing conditions in the Groundwood Mills.
(2) Experimental work in the Groundwood Mills with a view to finding the conditions of grinding most conducive to the production of uniformly good stock for the manufacture of News print.
(3) Control of grinding by systematic stock examination when the above conditions were found.
(4) Investigation of the conditions surrounding the formation of the sheet in the News Mill, including the condition, flow and regulation of stock, white water, and such problems as waste, steam consumption, moisture in product, etc.

Allotment of Parties.

To this end, the party was divided into two crews, one of which bent its energies to the Groundwood problems while the other one looked after the News Mill.

The writer spent the first month of the time with the Groundwood crew and during this time tests were run in order to get an idea of the normal conditions of grinding, as practised in the Groundwood Mills of the plant. The remaining three months of the Summer were spent in the News Mill Investigation.

Tests.

The main tests used by the department were:—

Consistency of Stock.—This test, a universal one, consists simply of weighing a suitable amount of stock, which is then dried done-dry and re-weighed. The bone-dry weight divided by the original or wet weight is the consistency. It should be noted that frequently consistencies are given as air-dry. An air-dry consistency is one in which the dry stock is considered as containing 10 per cent moisture.

Sedimentation Test.—The tester used was the Fishburn Sedimentation Tester as described in "Paper" of October 11th., 1916, and was invented by a Brompton man, Mr. V. E. Fishburn together with Mr. O. L. E. Weber.

The tester consists essentially of an upright graduated cylinder, preferably of glass tubing about 3 or 3¼ inches in diameter, and 14-in. high. At the bottom of the cylinder there is a piece of 70 mesh Fourdrinier wire which is clamped in place by a hollow metal cone or funnel, which terminates in a short metal tube fitted with a piece of ¼-in. rubber tubing. An ordinary pinch cock is provided for the tube in order to release the water in the cylinder.

In the course of many tests during the Summer it was found that the long tube mentioned in the description of the apparatus in "Paper" is not necessary, and is liable to introduce errors by retaining pulp unless it is very carefully washed after each test. Consequently the long tube was discarded and a very short one used in its place. This substitution had practically no effect on the calibration of the instrument as was shown by a serious of tests run for this purpose.

The method of operating the apparatus is as follows:—

Dilute the sample of slush received to about .5 per cent consistency and mix well in a mixer. Pour into a quart fruit jar. Pipette 25 cc. of this into a weighed shallow can and dry on a hot plate for 30 minutes, being careful not to burn the pulp. Cover the can and cool the can in a dessicator. Weigh the can plus the pulp, and from this get the weight of the dry pulp.

e. g.:—Weight of can .. .. 34.0989 grms.
Weight of can and pulp .. .. 34.2221 grms.
Weight of dry pulp from 25 cc. .1232 grms.

$$\frac{.1232}{25} = .00494 \text{ grms. per cc.}$$

$$\frac{1}{.00494} = 202.5 \text{ cc. for 1 grm.}$$

The consistency to run the test is best at 1 grm. per 2,000 cc., and we need 1,500 cc., to fill the apparatus.

$$\text{Therefore } \frac{1500}{2000} \times 202.5 = 152 \text{ cc., pulp necessary.}$$

Dilute this amount with water to 1,500 cc., and use this in the tester.

Before introducing the sample into the cylinder, water is poured into the cylinder and allowed to run out by the pinch cock till it just covers the wire disk. The sample is then introduced into the apparatus and the cock instantly removed. When the top of the sample has reached the second graduation on the glass the time is noted, or the stop-

*Notes on Investigations of the Technical Service Department at the East Angus Plant of the Brompton Pulp and Paper Company May to September 1920.

watch started. The time is again noted when the stock has reached the bottom graduation. The time taken in this way is recorded as the Sedimentation Time for that particular sample.

Care must be taken that the water used is of a constant temperature as the test falls down unless this is done. In this connection a test was run to determine the effect of temperature on sedimentation time, the results of which follow.

Sample taken from flow-box of #2 Machine at 10.10 hours July 2nd, 1920.

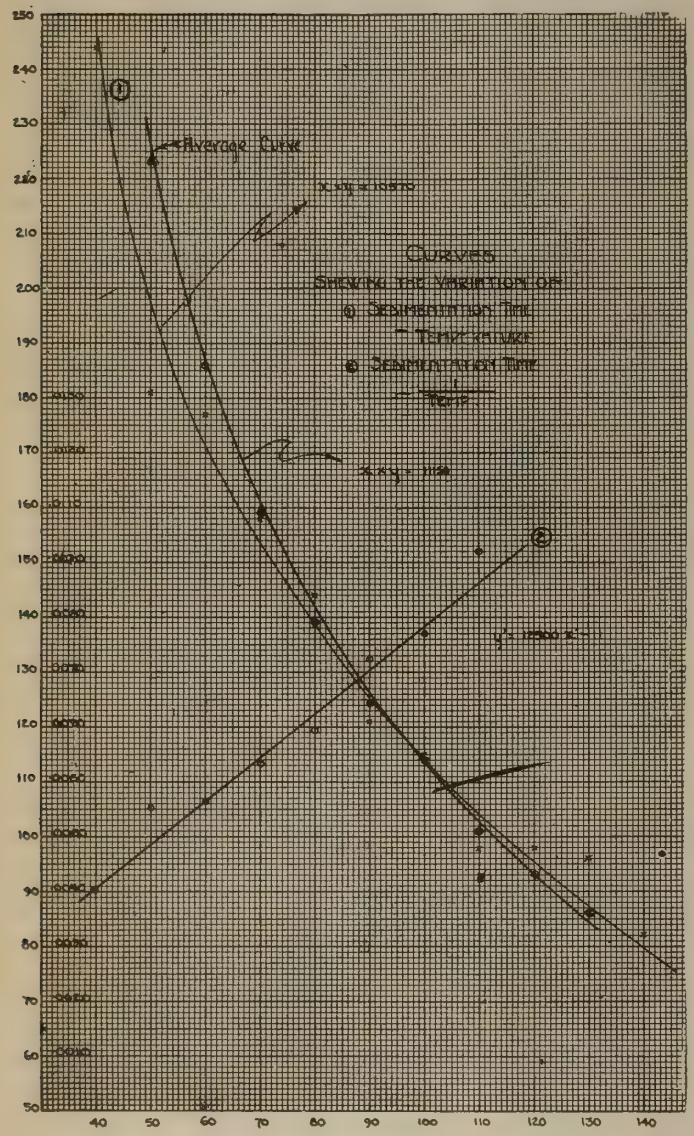


Fig. 1.

Bone-dry weight of pulp	No. of ccs. in 1500 at 1/2000	Temperature	Sed. Time	Reciprocal of Sed. Time
.929	161.5	40	244	.00409
		50	181	.00552
		60	177	.00565
		70	158	.00633
		80	144	.00695
		90	121	.00827
		100	115	.00870
		110	98	.01020
		120	98	
		130	96	

These results will be found plotted on the curves shown in Fig. 1, along with the reciprocal of time and an average curve for the purpose of showing how closely the results obtained agree with it. The equation of the curve was obtained by the following reasoning:—

Since the time decreases with the increase of temperature we can assume that the equation of the curves is the form

$$x \times y = k \quad \text{or} \quad \text{Temp.} \times \text{Time} = \text{Constant.}$$

$$x = \frac{k}{y} \quad \text{or} \quad \text{Temp.} = k \times \frac{1}{\text{Time}}$$

Let $\frac{1}{\text{Time}} = z$

Then $x = k \times z =$ equation of a straight line.

Now replotting Temp. as abscissae and reciprocal of time as ordinates we get curve #2.

$$y' = ax' + b \quad \text{or} \quad x = (k \times z) + b$$

$$a = \frac{dy'}{dx'} = \frac{50000}{4} = 12{,}500$$

b = value of y' when $x' = 0 = -11$;

When $4' = 0$, $x' = 34.3$

$y' = 1.25x' - 11$ is equation of reciprocal curve.

$$\text{Temp.} = \frac{12500}{\text{Time}} - 11 = \text{Equation of temp.—time [curve.}$$

or Temp. $\times$ Time $= 10{,}570$.

No attempt is made to counteract the expansion of water in these limits, nor for the expansion of the wire in heating, and therefore an error is unaccounted for.

Strength.—The ordinary Mullen tester is used, both in the News and Kraft mills. The operation of this machine is such that the sheet to be tested is held firmly in place over an orifice of one square inch area and broken by pressure transmitted by glycerin to a rubber diaphram. And indicator dial records the bursting pressure.

Basis Weight.—This is taken by the back-tender on the scales specially graduated for the purpose, so that the weight in pounds of 500 sheets of 24-inch x 36-inch is read directly by weighing a single sheet of that size.

Moisture in Paper.—Pending the arrival of a Williams Oven the moisture in the paper was obtained by weighing samples of paper as they were brought over to the laboratory in air-tight glass bottles. The paper was then put in the oven where it was allowed to dry for at least three hours, when it was again weighed. The loss in weight divided by the original weight gives the per cent moisture. Towards the end of August a Williams Standard Paper Moisture Tester was received and put into operation.

Microscopic.—The equipment of the laboratory included a microscope fitted with a plate camera, and these in addition to an enlarging machine built by a member of the summer workers crew gave an excellent opportunity for examining at close range, the quality of the fibres and the paper formed. Permanent records were made of certain types of stock for the purpose of comparison. Of the latter several will be found appendixed to this report.

Blue Glass Test.—This test was adopted by the Technical Service Department after due consideration of its merits and demerits, following observations on its use at the Groundwood mill of the Laurentide Company, as being the best test in existence for the purpose, viz.: The examination of slush for general quality of fibre. The apparatus used consists essentially of a piece of blue glass set in a suitable frame which will retain

water on the surface of the glass. When dilute slush is poured on the glass and viewed by indirect light its nature is shown up very clearly, and its suitability for the formation of a sheet is readily determined. Before definitely settling on the type of apparatus to be adopted experiments were tried with various forms, notably those in which the lighting arrangements differed. The type finally decided upon consisted of a tray containing four squares of glass set side by side and sliding under a small box which contained an electric light and a tin reflector. A circular hole was cut in the top of the box and was fitted with a reading glass. Thus four samples of stock could be examined and compared at

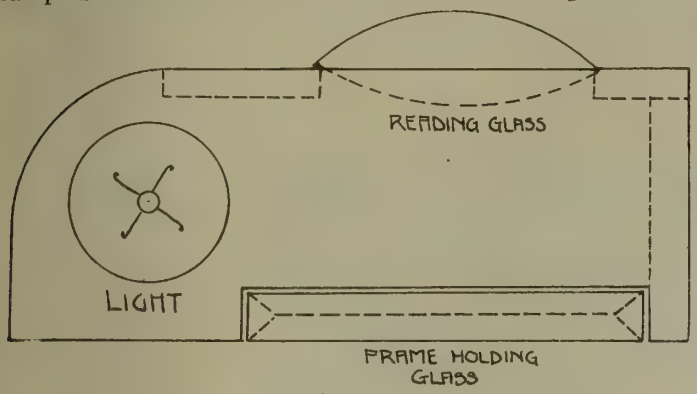


Fig. 2

the same time. Fig. 2 shows the arrangement of the instrument in its final form.

Lantern Test.—Examination of fibre as projected on a screen by a lantern was carried on for some time in conjunction with the Blue Glass but was later superseded by it.

An Assumption.

It is logical to suppose that if a mixture of groundwood fibres of a composition akin to the mixture of sulphite and groundwood now found in the flow-box of a news machine can be produced by technical control of the grinding and screening processes prior to the news mill, then newsprint paper can be made from groundwood alone.

Some Comparisons.

It is good mill practice to use 25 per cent sulphite and 75 per cent groundwood in the manufacture of newsprint paper. If one will look at the report of the News Print Service Bureau for the month of March, 1920, he will see that all of the twenty odd mills listed use more than twenty per cent sulphite with the exception of the Brompton Company which at that time was using in the neighborhood of eighteen per cent (18 %).

The report of the Canadian Export Paper Company's Cost Statement for the five mills under its supervision for the month of July, shows that the Laurentide Company, Belgo, Price Bros., and St. Maurice averaged over twenty-five per cent (25 %) of sulphite, whereas the Brompton Company was listed with 13·7 per cent sulphite. At the present time (September, 1920) the same company is using much less than this amount, and for several days has run successfully with a total of 8·3 per cent sulphite for news running at 660 feet a minute.

We assumed that if it were possible to obtain a mixture of groundwood fibres akin to the sulphite-groundwood combination, then newsprint paper could be made from groundwood alone. Old papermakers will tell you that if you run slow enough you can get a sheet of groundwood alone. Several International Paper Company men have solemnly assured the writer that it is impossible, because of extensive tests carried out in Glens Falls, N.Y., to make newsprint from groundwood alone.

Lack of Research.

During the last few years an extensive agitation has arisen among engineers and technical operators because of the hopeless lack of control in the pulp and paper industry. It is true that Mr. Robert B. Wolf has made a name for himself due to his original work, and also of his collaborator Mr. Hugh K. Moore, at the Burgess Sulphite Mill at Berlin, New Hampshire, but in the manufacture of mechanical pulp very little control work has been attempted, outside the work done by Mr. John Thickens, then chemical engineer, at the Forest Products Laboratories at Madison, Wisconsin, and lately undertaken in a few large news mills. And in the paper mills the old paper-maker reigns supreme. He has been taught how to make paper just as his father was taught how to make paper.

An Old Trouble.

The Fourdrinier machine of many years ago was, in principle and construction, although on a smaller scale, identical with the 940 foot a minute newsprint machine at Millinocket, Maine. The present day paper maker has a profound disuse for and dislike of the technical man, and it has been a hard problem for any engineer to introduce innovations in the paper mill. At the Brompton Mill we had a different condition. The Superintendent of the News Mill was an engineer, probably the only technical superintendent in the country, and, realizing the help he could get from our investigations, he gave us his hearty and helpful co-operation.

We begin in our hypothesis by assuming primarily that we always grind our wood in the same manner. We will explain a little later how we propose to do so.

Controlled Screening.

Let us examine first an ideal screening system.

If we have a uniform mixture of fibres at the bull-screens, then we attempt to screen always in the same manner. Therefore, we can expect, leaving the bull-screens, a stock which always contains the same proportion of long and short fibres. To carry the thing further, we try to screen uniformly at the fine screens, that is, we have the stock leaving the bull screens at say ·75 per cent consistency and we dilute, prior to the fine screens with a constant amount of white water, by a standardization of the valves, so that the stock always enters the fine screens at, say, ·45 per cent consistency. The high pressure white water showers in the screens is also controlled by standardized valves so that the stock leaves the screens at ·42 per cent consistency. If this is carried out we can expect, presupposing that the grinding was uniform, that the stock leaving the fine screens always contains the same proportion of fine and large fibres, and that the amount of tailings is constant. The tailings, and we always know the amount and the consistency, are rescreened through screens with the same openings as the fine screens. Whatever goes through, and our plan presupposes that always the same amount goes through, is number one stock. Whatever is rejected is sent to a Claflin refiner or a refiner of a similar type.

The refined stock is screened through a screen similar to the fine screens and the same process is carried on as before.

The idea of one type of fine screen does away with the possibility of losing our uniformity of longs and fines.

The next step is at the Thickeners. Here a constant head of stock back of the cylinder must be maintained because a constant amount of fines is being pressed through the cylinder and becomes white water, whereas a constant mixture is being gathered on the cylinder and removed to the decker chests.

The stock is then pumped over to the large storage chests in the news mill. Attached to the pump is a Trimbey Regulator. The principle upon which the operation of the Trimbey is based is that of the change in friction opposing the flow of stock of different consistencies, and is minutely explained in the pamphlet issued by the manufacturers. It may be stated parenthetically that a tendency was found of stock to overflow at times. This was remedied by the simple expedient of fitting a small plunger in the constant level box so that as it moved slowly up and down in the outlet pipe there was no chance of the flow being arrested by the accidental entrance of some insufficiently beaten stock or foreign matter.

A curve showing an actual test on the performance of No. 1 Regulator is attached.

We have now brought our stock from the grinders in our ideally controlled system to the point where it is regulated in consistency and here we leave it.

Formerly, before we decided that newsprint could be made without the addition of chemical pulp, the proper thing in the industry was to have a system of mixing chests. We will not discuss these because they are used at the present time in most up-to-date mills.

(The next instalment will take up Groundwood Control, etc.)

(To be continued.).

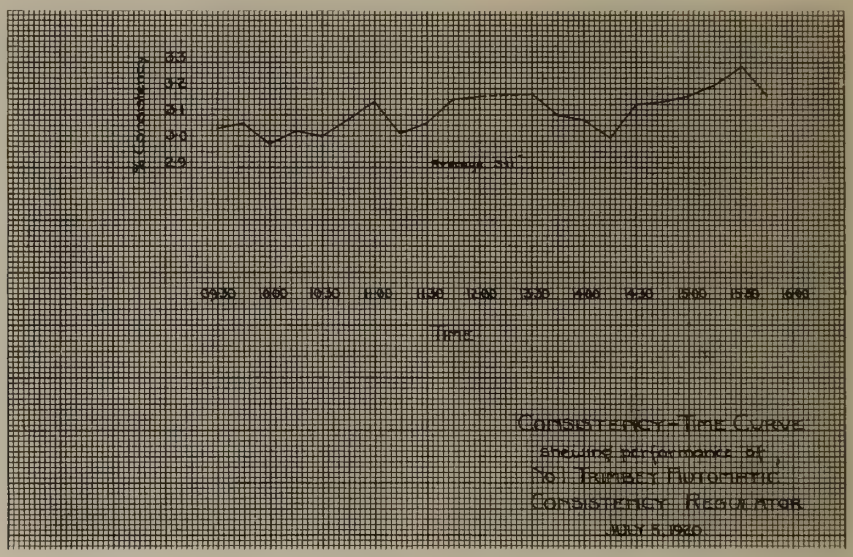


Fig. 3

HOW TO LINE UP A BOARD MACHINE.

In reply to the question on this subject in a recent number of the Pulp and Paper Magazine, the Editor has received the following:—

"We are interested in the question on lining up a board machine. This as you will probably appreciate requires a man of training and experience and is a matter which cannot be very well described in a letter, and we would strongly advise that the party who desires this information, if they actually require same, employ someone of experience to carry on the work, as it will undoubtedly be to their advantage.

Of course the basic principles of lining up any machine is to draw a line either through the centre line of the machine, or at any point parallel to it and square up all of the parts of the machine to this line. The line is usually run under the machine when same can be conveniently done, or if not over the top of the machine and plumb lines dropped, but the accuracy required should not be left to a novice, and we believe it can be best trusted to a man who has had experience. If we were to give actual detailed description of each and every move in the process, we do not believe results could be accomplished by an amateur, as there are certain parts on every machine, which require adjustment which only a competent experienced man is able to accomplish."

STRENUOUS WORK SEEING SWEDEN.

(Extract from letter from Mr. EDWARD BECK.)

"We arrived here yesterday after a week of strenuous traveling through Government and private forests. Our days have been very full. Here is a sample one: Arise at 5 o'clock, coffee and rolls served in room; motor about ten miles where we pick up the Forestmaster and are given additional coffee; motor some more to the Forestmaster's home which we reach at 10 o'clock and are given an elaborate "breakfast"; motor again with excursions into the woods running from ½ to 2 miles in duration; "lunch" about four o'clock in the afternoon and return to motor and tramping; arrive at another Forestmaster's about 11 at night where we get supper and a bed at about 12.30. Not every day is quite so full as that, but nearly so. One night we rode seventy miles after dinner at seven o'clock. It is quite light here at midnight so that night-driving involves no additional danger. We are being well treated everywhere and shown what there is to see. We went all over the Kramfors Company plants here today and leave tomorrow morning at ten o'clock for additional woods inspections."

A series of articles by Mr. Beck on "Forestry in Sweden" will begin in the next issue of the Pulp and Paper Magazine.

Another Successful Summer Meeting

On the 14th of June about thirty members and guests of the Technical Section, gathered at Montreal and departed for Three Rivers in two special sleepers. On Wednesday morning an entertainment committee consisting of C. King, J. T. O'Reilly and C. D. Jentz, Jr., representing the paper mills of that place appeared at the station and conducted the party to the hotel for breakfast. On extremely short notice because of the unable uncertainty as to whether certain features could be included, they had arranged a most enjoyable program.

A short walk from the hotel brought the party to the plant of the Wabasso Cotton Co., and a very thorough inspection of this excellent factory was made. The process was seen and explained from the opening of the bales of American and Egyptian cotton until the fibres were finally seen in beautiful snow white sheets, pillow cases and dress goods done up in neat and attractive bundles ready for use. An interesting feature was the electric boiler equipment which is used to maintain a steam pressure while manufacturing operations are stopped. It was pleasant to observe that the plant was running almost at capacity.

A Fine Pulp and Paper Plant.

The next point of interest was the new pulp and paper plant of the International Paper Co., which was described in the Pulp and Paper Magazine of June 9th. The officials in charge were most courteous and painstaking in their efforts to see that everyone in the party saw every point of interest and many new features of mill construction were seen and explained. It was the general opinion as expressed by many of the visitors that this plant is the last word in paper mill design and will prove to have an exceptionally low cost of production and maintenance. As the Vice President of one of the largest Canadian companies remarked: "It is a wonderful advantage for a company to have the opportunity of laying out the whole mill from the beginning on clear ground."

Since the information was collected for the descriptive article referred to it was noted that the pump house and filter beds are now practically complete, the third barking drum is in operation, a second pulpwood stacker has been erected, the foundations for the magazine grinders are set and the tank room is well under way, the paper machine room is housed in and the plant in general presents a much more finished appearance that at the time of the last visit of the editor. Paper makers will follow with interest the means employed by the designing engineers to obtain correct ventilation of the machine room and evacuation of the moist air without the use of hoods for the machines. From the explanation of the Superintendent of Construction their plan seems quite feasible.

Civic Luncheon a Delightful Function.

The party returned to the hotel at one o'clock and were received informally by civic officials and were entertained as guests of the City Council at a luncheon which was thoroughly enjoyed by more than forty guests. The committee had seen to every detail so the affair went off without a hitch. The chairman of the Entertainment Committee, Major Clement King of the International Paper Company, welcomed the guests to Three Rivers and expressed the pleasure of the companies at being honored with a visit from the technical men. He mentioned the exceptional advantages of the geographical position of the city and the very cordial cooperation and encouragement always given to industrial enterprizes by the city and the Province. He then introduced the acting mayor, Mr. Alfred Gouin. Mr. Gouin expressed regrets of the mayor at not being able to welcome the visitors but voiced the pleasure of himself and the Council in having the technical men visit the city of Three Rivers. He, too, emphasized the striking transportation facilities offered by the location of the city and ventured to predict that before many years Three Rivers will be the industrial centre of Canada.

The chairman then called on Mr. Percy B. Wilson, President of the Canadian Pulp and Paper Association who remarked on the very happy relations between the authorities and the industries in Quebec and expressed his appreciation of the delightful entertainment that the committee and the city had provided for the visitors. Mr. George Carruthers, Chairman of the Technical Section also was called on for a few remarks after which the Honorable Jacques Bureau, Representative of the district in the Federal House of Commons addressed the gathering. He remarked on the rapid growth of Three Rivers from an obscure village to a prosperous city of 30,000 inhabitants. He stated that the St. Maurice River represented greater potential horse power than Niagara Falls, and with the great forests of this water shed and the advantages of location for rail and ocean freight shipment and the presence of a contented, dependable and industrious population, the district—and he wished to speak for the whole valley—is sure to develop into one of the great industrial centres of the Dominion. The speaker dwelt at some length on the desirability of the Governmental policy which safeguards and encourages industrial development and individual enterprise. He spoke with delightful humor and his speech was not only interesting but very instructive.

Following the lunch a group of automobiles were ready to take the party on a sight seeing trip. These were supplied by the Chief of Police who led the procession, C. Jentz, J. Fortin, T. R. Argal, L. Morissette, G. H. Giroux, Dr. Germain and the Légaré Automobile Company. Most of them were driven by their owners. This feature was the contribution of the Board of Trade to the visit of the Technical Section and a number of other automobiles were on hand for the use of the party but were not required. This attention from the business men is but another evidence of the hearty cooperation of the people of Three Rivers in their desire to be accommodating and to work together for the good of their city. It may be stated here that the Chief of Police Emile Berthiaume was "the life of the party "during the trip around the city. At Cap Madeleine a visit was made at the plant of the Tidewater Shipbuilding Co. where the party saw under construction what were said to be two of the largest marine engines ever built on this continent. The visit to this enormous plant was certainly most interesting. On the return journey a stop was made at the plant of the Canada Iron Foundries, Ltd., where the visitors saw the excellent facilities of this company for making all kinds and sizes of castings. On the day of the visit the plant was running through an order of several sizes of iron pipe. An interesting point brought out in this visit was the successful use of concentrated waste

sulphite liquor as a binder in making the cores. This material is a by-product of one of the Canadian sulphite mills.

After supper in Three Rivers the party again took to the cars which had been parked at the station and left by the evening train for Grand'Mere. Here the Reception Committee under the Chairmanship of Mr. O. F. Bryant welcomed the party and a number of the visitors enjoyed a stroll about the town before retiring.

A Busy Day At Grand'Mere.

Thursday was a busy day for the visitors and every moment was profitably employed. After breakfast served in the diner, which the C. P. R. officials very kindly sent along with the sleepers, the visitors were divided into groups according to the parts of the plant to which they desired to give most attention. Information sheets had been distributed the day before which assisted the committee in arranging for guides and planning the trips through the mill so as to give the visitors the best use of their time. Interest naturally centered largely about the new high speed machines built by the Dominion Engineering Works and driven by the Harland Patent Interlock, speed controlled drive. An accidental break of the paper on one of the machines might have been staged for the entertainment of the visitors as it showed how a number of the difficulties involved in such a break can be handled with the electric drive. It is certain that a mechanically driven machine could not have been so easily and conveniently handled as was the case at this time. A number of the special features of the machine and the drive which have been already explained in previous articles in the Pulp and Paper Magazine were brought into play and furnished an exceptionally interesting demonstration for the members of the Technical Section.

Another feature of the mill which attracted a great deal of interest was the very well arranged and conducted department for wrapping, billing and shipping the huge rolls and bales of newsprint. Many of the visitors were also greatly interested in the wonderful way in which the Laurentide Company handles the social service work connected with such a large enterprise and the delightful opportunities for healthy recreation which are provided. After luncheon in the diner, for which the C.P.R. had very courteously provided special menus in honor of the Technical Section, the visitors did just as they pleased with regard to the manner of spending the afternoon. Some went back to the mill to investigate special features, others played tennis, some played golf, or watched those at play and some just sat around and enjoyed a quiet chat with a friend. During the afternoon a special golf match was played and this was followed by many of the fans.

In the evening the Laurentide Company entertained the Technical Section at dinner at the Laurentide Inn. While the guests were gathering and during part of the dinner the Laurentide Band provided an exceptionally fine program which was greatly appreciated and enjoyed. Between the courses of the dinner Mr. George Carruthers, Chairman of the Technical Section called for speeches from President Wilson, of the Pulp and Paper Association; Mr. George Williamson, President of the Technical Section of the Pulp and Paper Industry who extended a cordial invitation to attend the fall meeting of his association at Washington, Wilmington, Philadelphia and York Haven next October, and on Mr. John Stadler of the Belgian Industrial Company. In moving a vote of thanks to the Laurentide Company, the Belgian Industrial Company, and the industries and authorities at Three Rivers, Mr. J. N. Stephenson remarked that this was the sixth summer meeting of the Technical Section and that there had never been a wet day nor a dry meeting. The motion was heartily seconded by Mr. R. S. Kellogg, Secretary of the Newsprint Service Bureau, and was unanimously and vociferously passed.

The Industrious Belgians.

The special cars were taken to Shawinigan Falls on the evening train where the Reception Committee under Mr. Meerbergen and Mr. Chabot had provided refreshments in the meeting room in which the party gathered for a session of story telling and good fellowship until quite a while past sundown. On returning to the cars where a few of the party had retired, a self appointed quartette entertained (?) the visitors with a song, of which the editor, after much difficulty, succeeded in obtaining a copy. It runs as follows and is supposed to be sung to the tune of "Bubbles":

(1)

In the big mill,
The paper mill,
I'm working all day long,
Trying to make a decent sheet,
Believe me it is no song;
There's always something the matter,
Makes the boss mad as a hatter.

Chorus.

I'm forever having troubles,
Petty troubles all day long,
First its the screens, then the paper breaks,
Get off again the weight is wrong;
Always something doing,
Can't rest any more,
I'm forever having troubles,
And worse than I've had before.

(2)

If you make pulp,
You have no cinch,
You'll know what troubles are,
Making sulphite, making groundwood,
We have to suit your whim,
And if we don't do it always,
You lobsters refuse to use it.

Chorus.

I'm forever having troubles,
Petty troubles all day long,
First its the gas, then the pressure falls,
Get that too high and the yield is small;
Always something doing,
Can't rest any more,
I'm forever having troubles,
And worse than I've had before.

Naturally the party was not in motion very early on Friday morning but was in plenty of time to enjoy a delightful breakfast at the Cascade Inn as guests of the Belgian Industrial Co., and after that the visitors were conducted in pre-arranged groups by competent guides through all the departments of the mill. A great many

changes have taken place since the Technical Section visited Shawinigan Falls four years ago and the guests were interested and entertained by the explanations of the new construction work and the results which were being obtained. Many interesting features were described and the visit was most instructive.

The party again gathered in the meeting room when an address of welcome was made by Mr. Maurice Neilson on behalf of the company, and this was followed by a few remarks by Mr. T. B. Nuttall, of the firm of Bentley and Jackson, of England, and a member of the Technical Section of the British Paper Makers' Association. Mr. Nuttall gave Canada credit for having shown the way in regard to the organization of the Technical men in the industry and stated that the organization, of which he was a member, had followed largely the lead of the Canadian Technical Section. He observed that in his country as well as in Canada there was need for more and better elementary education and that the British Technical Section is planning to offer scholarships and to assist in every way the better training of paper makers along the lines of their vocation. He closed his remarks with a very cordial invitation to visit the meetings of the British Technical Section to be held in London.

The visitors were treated to an enjoyable auto trip around the city, again led by the chief of police.

A delightful outdoor luncheon was then served on the lawn and verandah of the Cascade Inn, and then the party left in their special cars by the afternoon train for Montreal, having finished what will be remembered as one of the finest meetings of the Technical Section which has yet been enjoyed.

CENSUS BUREAU REPORTS ON PAPER PRODUCTION.

The preliminary report of the census bureau on manufactures comparing the number of plants and the value of their products for 1919 and 1914 gives the number of paper and wood pulp plants reporting as 713 in 1919 as against 718 in 1914. The value of the 1919 product is given at $789,548,000, as compared with $332,147,000 in 1914. Other branches of the industry are reported as follows: Paper bags, exclusive of those made in paper mills, 75 plants as against 59 in 1919, and valued at $47,264,000 as against a 1914 valuation of $17,603,000; paper goods not otherwise classified, 305 plants, a decrease of five in five years, with a value of product of $101,473,000 as against $48,.871,000 in 1914; paper patterns, 19 plants as against 25 in 1914, and a product value of $1,528,000 as against $3,026,000 in 1914; pulp goods, 42 plants as against 24 in 1914, and a product valued at $24,257,000, as compared with $14,483,000 in 1914; wall paper not made in paper mills, 49 plants, a gain of one in five years, with a product valued at $23,095,000 as against $15,887,000 in 1914. The preliminary report is made to correction.

CHANGES FREIGHT RATES ON PULP AND PAPER.

The Interstate Commerce Commission has rendered a decision in the case of the rate on newsprint paper in carloads from Sault Ste. Marie, Ont., Fort Frances, Ont., and manufacturing points in Minnesota and Wisconsin to destinations in the west and southwest, finding existing rate unduly prejudical.

The commission has, pending hearings, suspended proposed increases in carload rate on pulpwood from South Carolina to Canton, N.C.

INDUSTRIAL FILTRATION OF COLLOIDAL SOLUTIONS.

The filtration of colloidal solutions, or even of suspensions, by current methods, presents great difficulties on account of the gradual clogging up of the pores of the filter and the accumulation of the residue. This requires a gradual increase in pressure; but the ultimate pressure attained is limited by the strength of the filtering cloths. These cannot withstand very long a pressure of 6 kilos per square centimeter (about 80 lb. per square inch), and require to be renewed quite frequently. Monel metal cloth, according to Gerhard Smith, cannot be made fine enough, and moreover it wears out quite rapidly. A further disadvantage of filter presses is the fact that they work intermittently and the deposit must be removed after each operation.

The main characteristics of Plauson's ultrafilter are that it works under very high pressure, which may reach 200 atmospheres (about 3,000 lb. per square inch), and that its operation is continuous.

The filtering surface is strengthened by means of a perforated metal cylinder which is surrounded by a series of metal gauzes of rather fine mesh. The effective mesh can be varied by suitably adjusting the pressure on the gauzes. As this is not yet sufficiently fine for filtering slimes or colloidal solutions, the pores must first be obstructed by means of a water suspension of the material to be filtered, or of asbestos, cement, plaster, etc.

Inside the cylindrical space in which the mass to be filtered is introduced, there is a rotating helical screw of such a diameter that the thickness of the deposit on the filter may be maintained constant at any desired thickness. The deposit becomes heavier as it descends through the apparatus and can be discharged at the desired consistency.

The liquid passes through the filtering medium (composed of the wire gauzes and the deposits) at a constant speed, since the thickness of the deposit, which constitutes the greatest obstacle to its passage, is also constant.

The wire gauzes can be replaced by perforated cylinders having preferably longitudinal slots.

Another method of constructing a filter capable of withstanding very high pressures consists in winding several layers of wire around a perforated cylinder. The liquid is forced to flow around the interstices between the wires, and these soon become clogged with the material to be filtered, which then acts as a filtering medium. By using a wire covered with cotton, asbestos, cellulose or paper, exceptionally active filters are obtained. The filters can also be impregnated with rubber, cellulose esters, etc.

British patent No. 155,834 (not yet accepted) of H. Plauson, Hamburg and J. A. Vielle, Westminster, shows the construction of the ultrafilter as described above.

One of the numerous uses to which this filter can be put is for the purification and sterilization of water. The sizes of the pores of the filter can be adjusted so that it will hold back not only the colloidal impurities, but even the bacteria, thus doing away with the necessity of the large settling tanks which are used at present.

A. P.-C.

(Dr. J. H. Frydlender, in La Revue Des Produits Chimiques, **24**, 181-2, March 31, 1921).

News From Europe

(A digest prepared for Pulp & Paper by Dr. Paul Bartholow.

The Market Position in France.

There seems reason to believe that the liquidation of stocks is practically finished. The volume of actual business, however, hardly warrants an optimistic feeling, for such business as is recorded mainly reflects an expectant attitude. The difficulty is to account for any "business" where all are vociferously braying, "nothing doing". The truth is that paper is consumed in ever increasing quantities; somebody, therefore, must be a buyer, but who is he? According to La Papeterie, there have been very large dealings in news print. The price is not revealed, but it is alleged that the Scandinavian countries are delivering news print in Paris at such figures that it costs 130 francs c.i.f. French port. Meanwhile French makers are offering paper on the same terms, which means that the consumer must pay four times what he did before the war. The manufacturer, on the other hand, who sells at such a figure is not meeting the cost of production. —LA PAPETERIE, May 10, 1921.

The Paper Trade and Prohibition.

Norway and Finland recently passed anti-alcohol laws which have exerted a decided check to the export trade of these countries. As the Papier-Zeitung says: "For the wood and paper-producing countries of the North, whose anti-alcohol rules have proved stumbling-blocks to the entry of French wines, the market in France is now due for a reprisal. In April France raised the coefficient of increases on the imports of wood and paper (with the exception of news print). In this way Finland was chiefly affected. Duties on goods imported from this country are four times as high as the duties hitherto in effect. The result is that, whereas Swedish paper bears a duty of 400, 300, and 600 francs, the same grades of Finnish paper pay a tax of 1800, 1200, and 2400 francs a ton. Sweden, it is to be noted, admits French wines. The outlook in Finland is therefore darker than ever, because in addition to its liquor policy it is undergoing a disastrous change caused by the world's crisis. In fact French markets are practically closed to Finnish wood and paper. Formerly France took about 26,700,000 francs' worth of these products from Finland. As Finland has no commercial treaty with France there is no immediate prospect of a lower duty on Finnish goods.

The Paper Trade in Italy.

The reading of Italian trade journals is depressing. The impression left is that business and industry are both discouraged by political conditions. In a leading article the Industria della Carta observes that "in the actual circumstances created as a consequence of the war it is no longer possible to draw a distinction between politics and that complex of phenomena, both technical and economic, which constitute the great and throbbing life of industry, commerce and labor."

The journal proceeds to dwell upon the absurdities and difficulties of the present European situation. To anticipate a general return of confidence would be premature with so many uncertainties ahead; it is evident from the cautious manner of hinting at these uncertainties that they must be too serious to divulge. Another factor, also, is the endless negotiations over the division of the old States of Europe. Formerly after wars, Europe possessed statesmen who had brains and knowledge and were not obliged to have one ear always at the United States megaphone. The consequence was that Europe then made peace and settled down, and avoided the anarchy which, under different names, now extends from Warsaw to Rome. This "anarchy," says the Industria is due to the spineless acquiescence of ministers who are too weak to govern." Such men deliberately accept power "which they have to renounce, while the apparent calm produced by their feeble and futile characters, really conceals the germs of revolution."

There is a lack of "harmony" or, in other words, anarchy, in Italy and other countries, a lack of harmony between capital and labor, but in Italy greatly intensified by the barren legislation of the Chamber of Deputies. A new Chamber is now elected. Will its work be an improvement? No one can tell, but it is clear that revolution may spoil the efforts of politicians who are trying to find a new industrial formula. "The industrial classes, the thousand of citizens who live by trade, the laboring classes expect from the Chamber a work of restoration and speedy return to the normal."

The Trade Understanding Between Italy and Czecho-Slovakia.

As compared with former times the business between Italy and the old Austrian states is conducted with a maximum of official interference on both sides. All this is made clear in the terms of the "commercial convention" with Czecho-Slovakia. The exchange of goods is always "contingent" upon various things—stability (for which obviously there is no guarantee), probable growth of industry, etc. For example, Czecho-Slovakia undertakes to deliver 50,000 quintals of chemical wood pulp to Italy provided production is sufficient, and 100 car loads of news print and 5000 tons of kaolin under the same conditions—in other words all or nearly all trade is contingent. Payments may be made in crowns or lire at current rates, but since the Czecho-Slovak crown has fallen to about a cent and a quarter business is doomed to partial or "contingent" failure. Such is the result of rash and foolish experiments in politics.—INDUSTRIA della CARTA, May 1921.

THE FAVORED TREE.

By F. H. MASON.

Had it been destined I should be a tree,
With power to choose the kind of tree I'd be,
I would not be an oak of massive spread—
The after life as furniture I'd dread;
Nor a mahogany—the polished state
Of later years would be too tame a fate;
Nor would I be an apple or a pear,
Supplying fruit as just a passing fare.
No. I would be a spruce of northern wood,
And I would be cut down, while young and good,
And mashed to pulp. And in the paper state
The Muse's dreams I would perpetuate.
Philosophers and writers of all kinds
Would trust to me the secrets of their minds;
And to posterity I would hand down
The brightest gems set in a golden crown.

Mr. McCarthy's report indicates that owners of pulp wood timber can come back after twenty-five years, secure more timber than was taken in the first cutting, and still leave a better stand than was left after the first cutting, if they protect their cut over lands from fire.

Canadian Vegetable Parchment Company, Ltd.

By A. R. R. JONES.

The Canadian Vegetable Parchment Company, Ltd., is in the unique position of having the only mill of its kind not merely in Canada, but in the British Empire. At its mill at Merritton, Ont., it manufactures genuine vegetable parchment. This is advertised under the trade name of "Purity Parchment"—and the name is a good deal more apt than are the trade names one sometimes sees given to other articles of commerce, inasmuch as it is a just description of the quality of the product which the company turns out.

For no indifferent paper comes from, or, indeed, is made in, the Canadian Vegetable Parchment Company's plant. The finish is the same each and every day—there is no change in it whatever, no matter what the cost of commodities may be. It is this resolute adherence to the highest possible standard of quality in its product that has given the company in the comparatively short time during which it has been operating —for construction of the Merritton mill did not commence until August, 1919—a reputation which many commercial concerns, much longer established, might well envy.

The plant at Merritton is exceptionally well planned and constructed, the arrangement of the various manufacturing units being notably well devised, while the machinery is all of the most modern and efficient kind. The buildings are of brick, stone and concrete construction. The shipping facilities are all that could be desired, sidings of the Grand Trunk, Canadian Pacific, Canadian National, and Niagara, St. Catharine and Toronto railways running right by the plant. Further, the mill has the advantage of an unexcelled water system from wells of water of a most suitable quality for the purpose required.

The company has under construction a second parchment machine, and this, when installed, will double up the present producing capacity of the plant which is 2,000 tons per year of genuine vegetable parchment. It is gratifying to learn, as the writer did in conservation, this week, with Mr. C. V. Syrett, the company's president, that the plant at Merritton is running night and day, with orders seven or eight weeks ahead. The parchment paper it produces is already favorably known in Australia and New Zealand as well as in this country in which rather more than fifty per cent of its output is used.

The parchment paper produced is used for the purchase of wrapping meat, poultry, butter, oleomargarine, lard, cheese, ice cream bricks biscuits and so forth. In this connection, it may be noted, as a satisfactory evidence of the manner in which the Canadian trade is backing up their Canadian enterprise, that the imports of parchment paper are sensibly diminishing each month. At one time nearly all the parchment paper used in Canada was imported from overseas, but, during the war, this trade became diverted from Europe and passed under the control of concerns in the United States. Frequently in the columns of this magazine, emphasis has been laid on the desirability of the use, by our Canadian manufacturers, of "Made-in-Canada" paper only. It ought to be self-evident that such manufacturers should give to the only Canadian concern making genuine vegetable parchment paper the same preference that they rightly urge the public generally to give to the commodities that they themselves manufacture.

This class of paper is difficult to manufacture and necessitates highly scientific operation. From the very first, the sheet produced was beautifully white, clean and strong and evoked from the Canadian trade hearty expressions of satisfaction, and, as has been stated, the company is resolved to adhere to the high standard of quality that it has set for itself. It should be mentioned that, quite recently, this parchment paper has passed quite a severe test at the hands of the Australian Government. In that country, more severe tests on parchment are the rule than obtain in any other, and samples of "Purity Parchment" sent to the Australian Government have called forth a very favorable report on its quality. Nor is this, in any way, surprising, for in the operation of its plant, the company imposes the most stringent possible tests at every step in the process of manufacture, as well as subjecting all raw materials to the most rigid examination.

The officers and directors of the company are as follows: Mr. Charles V. Syrett, president; Mr. Lauren H. Gardner, 1st vice-president; Mr. W. H. Howe, 2nd vice-president; Mr. Leo E. Charles, secretary-treasurer; and the other directors are Messrs. Charles F. Hubbs and H. J. Severance.

TUB SIZED, LOFT-DRIED PAPER.

Many buyers of paper have heard their Printer say, "This sheet is tub sized, loft-dried paper." There are also many who do not understand what the words really mean.

In the first place, paper is sized with a glue solution made from hides. This process gives to the paper a writing surface and also holds the fibres more firmly together, thus making the paper stronger.

There are two ways of sizing paper, says "The Crest": The size in the cheaper papers is mixed with the pulp before it goes over the paper-making machine and, in many cases, dries in hard lumps in the paper when going over the drying rolls.

The tub sized sheet passes through a tub of size after the paper is made and, consequently, receives an even coating of the size on the top and bottom surfaces This process insures a better surface and a stronger sheet.

There are also different ways of drying paper. The cheaper papers are dried as they are made on the machine. Others are air dried, passing on festoons until dry. The loft-dried sheet is hung up in lofts for weeks until thoroughly matured. This latter operation also makes the sheet stronger and gives it the crackle so pronounced in high grade bond and ledger paper.

Merton R. Sumner has been appointed Chief Engineer of Arthur D. Little, Inc., Chemists, Engineers and Managers, Cambridge 39, Mass. Mr. Sumner was formerly Chief Engineer for New England of Fred T. Ley & Company, Inc., in charge of about 125 construction projects and more recently was Chief Engineer of the Fuller Industrial Engineering Corporation, a subsidiary of the George A. Fuller Company.

General News

(Clipped from the Bulletin of American Paper and Pulp Association.)

Superintendents' Association Prospering, Has Fine Convention.

Important steps toward improving the field of opportunity for service to the paper industry by the superintendents were discussed during the annual convention of the American Pulp and Paper Mill Superintendents Association, in its three day session at the Waldorf-Astoria, New York, June 3 to 5.

Important discussions of mill problems, entertainment of the highest type, and plans for future cooperation to achieve greater efficiency in the mills were some of the features of the three days of meetings, and the association not only discussed mill problems, but also plans for making the association itself more helpful to the industry.

John H. O'Connell, of the King Paper Company of Kalamazoo, was advanced from first vice-president to the presidency, succeeding Fred C. Boyce, of Wausau, Wis., and other officers elected were:

First Vice-President—George K. Walker, Glens Falls, N.Y., of the Finch-Pruyn Company.

Second Vice-President—Nelson R. Davis, S. D. Warren Company, Cumberland Mills, Me.

Third Vice-President—A. O. Rolfe, Champion Coated Paper Company, Hamilton, O.

Treasurer—Peter J. Massey, W. F. Hall Printing Company, Chicago.

The association has become such a busy, important organization, that Mr. Massey was unable to undertake for another year the duties of Secretary, and a successor will be chosen by the executive committee.

Six divisional chairmen were elected as follows:

New York Division—C. T. Jewell, St. Regis Paper Company, Herring, N.Y.

Michigan Division—Edward T. A. Coughlin, Monarch Paper Company, Kalamazoo, Mich.

Northwestern Division—R. J. Cunningham, Northern Paper Mills, Green Bay, Wis.

Miami Valley Division—A. O. Rolfe, Champion Coated Paper Company, Hamilton, O.

Northeastern Division—N. R. Davis, S. D. Warren Company, Cumberland Mills, Me.

Canadian Division—W. A. Anderson, Kinleith Paper Company, Ltd., St. Catharines, Ont.

The Friday evening program was devoted to entertainment, while the Saturday evening banquet was made notable by an address on Americanism by United States Senator Frank Willis, of Ohio, who, as part of his address, urged the restriction of immigration to give American workmen a chance to work, and thus relieve the problem of unemployment.

The convention sessions began Friday morning, and continued through Saturday afternoon, with various problems of the mill superintendent discussed by speakers and from the floor as well. Sunday's program was one of entertainment.

Making National Study of Forest Problem.

Elaborate plans are being made by the Chamber of Commerce of the United States for the facilitation of the investigations by its committee on a forestry policy, on which the paper industry is represented by Dr. Hugh P. Baker, secretary of the American Paper and Pulp Association. The committee will hold a meeting in New York June 27 and 28, to discuss forestry problems in the east, and will probably hold a meeting in the region of the lake states about July 19 to meet those interested in that section. The committee will then make a tour of investigation to the Pacific coast, leaving the Chicago meeting for the northwest. The trip is the first ever made by any investigating committee of the Chamber of Commerce, and is evidence that the Chamber appreciates the importance of this problem, in whose solution the paper industry is taking an important part.

Conditions in the Paper Industry Abroad.

The French decree of June 16, 1920, relative to the prohibition of importation of pulp for news print paper, and of October 23, 1920, regulating import of paper in rolls have been annulled.

American paper contracts for Brazil delivery have suffered from German competition in addition to the problem of exchange; for German exporters are offering some grades 60 per cent below New York quotations, though it is doubted by some whether they can deliver according to contract. The result, however, has been cancellation of some American orders.

The manufacture of paper in Argentina is described in a report by Trade Commissioner Philip S. Smith, who says it is confined largely to wrapping, writing and colored papers and cardboard, all of which are fairly protected by import duties. Some newsprint has been made also. Importations of chemical pulp total 25,000 tons annually, and only one mill is known to be making pulp locally, this being from a species of willow on the islands of the Parana river delta. Pulp can be made from raw materials in the republic, but not in competition with the product of Sweden, Canada or the United States.

Describes Paper Mill Conditions Abroad.

The situation in the pulp and paper industry abroad is worse than in the United States and Canada. Mills have large stocks of both raw and manufactured materials, are cramped for capital and have no orders; consequently, they are almost without exception operating on short time," says Arthur C. Hastings, former president of the American Paper and Pulp Association, in an analysis of the foreign paper situation, in giving his conclusions based on his recent trip abroad. His report was written for the Writing Paper Manufacturers Association, but was so filled with interesting comment that it is herewith abstracted for the industry at large. He says in part:

"Under normal conditions the pulp and paper made in Norway, Sweden and Finland find a market in England, France and Germany, with a small percentage sold in the United States, but now both the paper mills and dealers in these countries, with the exception of Germany, are overstocked with pulp and paper bought on a high market.

"Germany is the 'fly in the ointment' and all the exporting nations are filled with forebodings as to what she will accomplish in her effort to 'come back.' The possibilities, as they see it, are as follows:

"All valuations in Germany that enter into the cost of living are about four times the pre-war rate. As the present value of the mark is 1½ cents in our money, or one-sixteenth of par value, and as the purchasing power in Germany is one-quarter of normal, a United

States dollar in Germany would, when converted into marks, have the same purchasing power as $4 has in this country. If, for example, the German paper maker, in order to dispose of his produce, is obliged to offer machine finish at 4 cents per lb., f.o.b. his mill, the 4 cents in our money has a value of 16 cents in his country when converted into marks, and on this basis he is really getting a splendid price for his produce, although sold here at a price which on its face appears to be ruinous. In other countries where the difference in exchange is not so much, the advantage to the German is not so great, but almost without exception it is sufficient to insure a price so low that no other country can profitably compete.

"In considering this situation it should be borne in mind that the German Government, either directly or indirectly, has subsidized all industries, which in effect reduces the cost of production, and as a further assistance to this end, has recently passed a law authorizing the cutting of wood for paper making from the German forests for a period of two years at a low price per ton of pulp. I understand it costs them 900 marks or at present exchange $14.00."

Descibes Testing Methods for Papermen.

Three recent publications of the Bureau of Standards relating to paper may be secured of the Department of Commerce, as follows:

Circular 107—The Testing of Paper, Feb. 12; 37 pages, 18 text figures. 10 cents.

Technological Paper 187—A study of test methods for the purpose of developing standard specifications for paper bags for cement and lime, by Paul L. Houston. March 21; 19 pages, 54 text figures. 5 cents.

Technological Paper 189—Method for differentiating and estimating unbleached sulphite and sulphate pulps in paper, by R. E. Lofton and M. F. Merritt. April 4; 18 pages. 5 cents.

Cost Association Already Beginning Plans for Fall Convention.

At a meeting of the Executive Committee of the Cost Association of the Paper Industry held at the Nyassett Club, Springfield, Mass., on May 17, it was definitely decided afte some discussion to hold the next convention of the Cost Association in Chicago, Ill. on Oct. 6 and 7, provided that these dates did not conflict with any other arrangement made by the secretaries of other associations. It having been ascertained that such was not the case, these dates have been duly decided on. The Secretary-Treasurer will be glad to receive any suggestions as to speakers for this convention. Speeches will be limited to about twenty to thirty minutes apiece, in order that there may be plenty of time for discussion of each subject when the speaker has concluded his remarks.

In the future the Cost Association will hold two conventions a year, one in May and one in October. Notices will be sent out shortly to all members proposing that the by-laws of the Association be changed to this effect.

Chester M. Clark, formerly head of the Corporation Department of Stone & Webster, Inc., and during the war secretary of the underlying company at Hog Island and assistant to Mr. Matthew Brush. the president of that corporation, has been elected treasurer of Arthur D. Little, Inc.

HISTORY OF THE STURGEON FALLS MILL.

(From the Spanish River News.)

There is always something interesting about the birth of a new industry and with it the establishment of a new town.

It is said that in the old days a politician in looking over the map of the province of Ontario took his indelible pencil and marked a line from Sault Ste. Marie through Sturgeon Falls, which at that time was nothing but a mass of heavy timber. This he pointed out should be a part of a transcontinental railroad. To-day the C.P.R. is probably built on this line.

The picture below is one of a saw mill built in the early eighties on the site of the present wood room. Some of our old settlers will recognize this mill as that of Martin Russell.

The story goes that in 1882 the lot was entirely covered with timber and included the falls belonged to James Holderidge, one of the first pioneers of this town. He sold the lot to John Clark, father of J. A. Clark, of this town. The property was sold with the condition that a saw mill would be put up at the falls which would use the power developed at this point.

Mr. Clark had brought his portable steam mill with him and as he wanted to use his own mill he sold the site of the falls to Renalder McConnell in 1883. Evidently he had Mr. Martin Russell in mind when he bought the property, for Martin Russell was the man who put up the first mill. Mr. Hugh Baxter bought this mill in 1886. The mill was then sold to Heath and Pageant, of Huntsville. They in turn sold the whole site and mill to the Imperial Paper Company, which was first under the management of a Mr. Brimmer. Later the mill was managed by Mr. Craig, who for a long time was a resident of this town. After a time the company became insolvent and the banks took the mill over. Shortly after this very little work was done at the mill for several years.

Many of the old settlers of this town will tell you that in spite of the fact that the mill was practically doing nothing, the whistle blew as merrily as it does to-day.

The Spanish River Pulp & Paper Mills, Ltd., bought this mill a few years ago and with experienced men cleaned up the mill and started the wheels turning over. Many replacements and improvements have been made since the present ownership.

The new and up-to-date paper machine, the new additional boilers and the new grinder room to be completed, together with the power development at Smoky Falls is a sure sign of progress both for the mill and the town. The increase in the number of new houses also shows that we are outgrowing our little town and must keep pace with the developments at the mill.

IMPORTANT WOOD BULLETIN READY SOON.

The pulpwood consumption under preparation by the United States Forest Service in co-operation with the American Paper and Pulp Association and the Census Bureau, is rapidly approaching completion, though the collection and compilation of the statistics has been a difficult task. The preliminary statement already sent to members of the association in a special letter from the association offices shows that the 1920 consumption exceeded the greatest previous record by *36,000 cords, or nearly 12 per cent and in value exceeded the amount paid in 1919 by $29,000,000 or 19 per cent. It was 37 per cent over the amount paid in 1918.

Technical Section

REVIEW OF RECENT LITERATURE.

A-13; A-15. Committee on Chemical Standards. The present ball mill method of determining the strength of sulphite pulp does not give comparable results when performed by different operators, and it is likely that the method produces results which may be considered more directly as a measurement of the effect of beating than as a true determination of sulphite strength. It is recommended that the question be referred to a committee on sulphite pulp for consideration and that this committee develop a method which wil give a true indication of the actual strength of sulphite pulp. The coal tar dyestuffs marketed in Canada are of very variable quality and it is recommended that the question be referred to a committee on sulphite pulp for consideration and that this committee develop a method which will give a true indication of the actual strength of sulphite pulp. The coal tar dyestuffs marketed in Canada are of very variable quality and it is recommended that a special committee be appointed to study the entire question of dyestuffs in relation to their use in the paper manufacture. It is recommended that a detailed study be made of methods which can be presented for adoption as standard for grading newsprint and wrapping papers, each of the following factors being taken into consideration—weight, finish, cleanliness, strength, formation, thickness, color, moisture. The methods officially adopted for the analysis of clay filler (water, color, fineness, elutriation, and plasticity) are briefly described.

A-15. Committee on Testing Moisture in Pulp. It is recommended that a committee should be composed from the English, American and Canadian Technical Sections and have power to decide as to which of the strip, disk, or wedge method of testing moisture in pulp, or if all three should be used in matters of testing dry pulp in rolls or bales.

A-15. Testing Sulphate Pulp for Strength. K. G. WILEN. **Pulp and Paper,** xix, 68-72 (Jan. 20, 1921). Address before Technical Section, Canadian Pulp and Paper Association.—A. P.-C.

B-3. Protecting Popler Trees from Borers. Pulp and Paper, xix, 30 (Jan. 6, 1921). According to the U. S. Dept. of Agriculture, the aspen borer can be controlled by either of two methods. The first consists in destroying the insect by cutting the brood trees, and the second, which is not practical in the forest but is applicable to shade trees, is the application of carbolineum or creosote to the egg scars. This should be done in October after the adults have deposited their eggs.—A. P.-C.

B-0. Paper and Forests. Pulp and Paper, xix, 58 (Jan. 20, 1921). Twelve years ago the United States forests furnished all the raw materials for the United States paper industry; while now a full third of the paper or papermaking materials used in the United States comes from Canada. Most of the mills are in the coniferous forest belts of New York, New England, and the Great Lakes where, at the present rate of cutting, the pulpwood cannot last more than 15 to 18 years. By means of a proper forestry policy, the New England, Middle Atlantic, and Lake States could supply the paper mills several times over with pulpwood if they were kept at work growing it.—A. P.-C.

C-0. Fire Prevention in Pulpwood by Means of Artifical Fog. F. J. HOXIE, Boston, **Paper,** xxvii, 15, 13-9 (Dec. 15, 1920); **Pulp and Paper,** xix, 5-7 (Jan. 6, 1921), 37-9 (Jan. 13, 1921). A large log pile fire presents an exceptionally difficult problem in fire protection and engineering, in that many times as much quick-burning fuel is present in a concentrated mass as is found in any form of building in which fires are commonly fought. The absence of walls and the exposed position and height of the log pile cause ideal draught conditions, so that the rate of combustion is ultimately limited by the velocity at which air for combustion can be carried away. If a fair sized pile should become ignited, there is practically no chance of mastering the fire after the first 10 to 15 minutes; and in such a case the best that can be hoped is to prevent it from spreading to other piles. The rate of combustion in fires of this nature is generally in the neighborhood of 25,000 to 30,000 per minute, liberating enough heat to evaporate about 25,000 to 30,000 gallons of water a minute. The wood may be protected in two ways: by making several separate piles, so that if one of them should become ignited the others may be protected; and by keeping the surface of the wood continually moist so as to prevent it from becoming ignited. The former method is more costly but may be employed when the quantity of wood handled is not too large. It is especially worth considering for the manufacture of chemical pulp from dry wood. In the case of very large piles the second method seems to be more promising. The method consists in spraying the pile with sufficient water to maintain the air in the immediate neighborhood of the pile saturated and the wood in the pile continuously wet. It has been calculated that about 60 gallons per minute ought to be enough, even in August weather, for a 10,000-cord pile. A permanent system which suggests itself as highly practicable where fixed conveyers are in use, is to attach half-inch pipe to steel cables from the conveyor to the ground at a sufficient height above the pile to prevent damage from the falling logs, the pipes being spaced about 20 ft. apart along the conveyor with heads about 30 ft. apart along the cables, these heads discharging half-a-gallon a minute each. Experiments are now under way at six large paper mills at least on the use of spray nozzles the object being to determine the most effective spacing arrangements of piping and capacity of heads. Results thus far indicate that 2 qt. heads as manufactured by the Spray Engineering Company, spaced 30 feet each and elevated 5 feet above the surface of the pile, will give satisfactory service with a pressure of 50 to 70 lbs. at the head. Half-inch branch pipes feeding 5 to 8 heads appears to be large enough. The main feed pipe should be large to supply monitor nozzles and to keep down the water velocity to prevent keeping sediment in suspension, which would clog the nozzles. Both methods of protection against fire have the further advantage of protecting the wood against decay also. The decay of wood is due to bacterial action, and the organisms

require a certain amount of moisture to develop. If there is either insufficiency or excess of moisture they cannot develop, so that the protection of the pile against decay is obtained by keeping the pile either too wet or too dry for the organisms to develop properly. —A.P.-C.

D-5. Process for Making Bright White Groundwood Pulp. Papier Markt (Dec. 1920); **Pulp and Paper,** xix, 12-3 (Jan. 6, 1921). The wood is subjected simultaneously to the action of a temperature of 100° Cent. and to a hydraulic pressure which may be as high as 10 to 13 atmospheres. When the pressure is lower, the time of the treatment must be lengthened. According to German patent 280,717, the wood is treated for several hours with hot water under pressure at a temperature of 100° Cent. or less; and according to German patent No. 315,679, it is treated with water at 80° cent. under a slight vacuum so that the water is continually boiling. The wood treated by any of the above methods, it is claimed, is much whiter and easier to grind.—A. P.-C.

G-8; K-12. Pulp Vat. Can. patent No. 207-485, AKTIEBOLAGET KARLSTADS MEKANISKA VERKSTADS, assignee of RUDOLF ERNST WAGNER, both of Karlstads, Sweden, Jan. 11, 1921. In a pulp vat and the like, the combination of a rotary strainer cylinder for gathering the pulp, and a press roller pressing against said cylinder and provided with peripheral grooves, notches, deep slots, or the like, for the purpose of rendering possible an increased pressing out of the the pulp sheet gathered on the strainer cylinder.—A.P.-C.

G-6; K-11. Cylinder Strainer for Woodpulp. Can. patent No. 207,484. AKTIEBOLAGET KARLSTADS MEKANISKA VERKSTAD, assignee of RUDOLF ERNST WAGNER, both of Karlstads, Sweden, Jan. 11, 1921. In a strainer cylinder for woodpulp and cellulose, the combination of a pulp container, a rotary cylinder divided into cells, a strainer cloth surrounding said cells and forming the outer surface of said cylinder, and upwards rotating portion of said strainer cloth above the horizontal plane through the axis of the cylinder forming one wall of said pulp container, a stationary suction box located in the interior of said cylinder within said cells and having a suction opening opposite the upper part of said portion of the strainer cloth forming a wall of said container, and a wall opposite the lower part of said portion of the strainer cloth, said wall forming a stationary bottom for the cells covered by said part, for the purpose that during the rotation of the cylinder the cells moving into the pulp container shall at first be closed and shut off from the suction box and afterwards placed into communication with said suction box when a filter layer has been formed on the strainer cloth over said cells by natural straining.—A.P.-C.

K-2. Recovery of Waste Heat. Can. patent No. 207,486, AKTIEBOLAGET KARLSTADS MEKANISKA VERKSTAD, assignee of RUDOLF ERNST WAGNER, both of Karlstads, Sweden, Jan. 11, 1921. A means for recovering heat leaving paper machines and the like, comprising in combination a collecting vessel for steam, air and water, rotary surfaces in said vessel partly submerged in the water in the same, means for collecting and conducting the waste steam and hot air from the machine into said vessel, means for removing cooled air from said vessel.—A.P.-C.

K-6. Preparation of Paper Pulp from Sugar Beets. Bull. Synd. Fab. Papier et Carton, xxii, 349-50 (Dec. 1, 1920). The pulp remaining after the extraction of the sugar is treated with lime water or other alkaline liquor, heated for half-an-hour to 80 to 100° Cent., and drained. If the pulp still has an acid reaction, it is subjected to a second alkaline treatment. The pulp is washed thoroughly, subjected to the usual mechanical treatment, and bleached. With 1 to 2 percent of available chlorine a cellulose is obtained which is suitable for the preparation of nitrocellulose. For the manufacture of cardboard, it is sufficient to bleach the pulp with SO_2. The raw material should be treated as soon as possible after it comes from the diffusers.—A.P.-C.

K-7. Beating — Today and Tomorrow. W. B. CAMPBELL, **Pulp and Paper, xix, 65-7** (Jan. 20, 1921). Brief historical sketch of the hollander. Numerous attempts have been made to improve beaters, but with the exception of the jordan, they have all gone to the scrap heap. The outstanding feature of the ordinary beater which has kept it in use so long is the facility with which it can be used to secure any desired result. The better known improvements to the hollander are the Rabus, Marx, and Niagara beaters, lava rolls and the jordan refiner. The latter is taking the place of the beater to an ever increasing extent; but it is unlikely that it will ever replace it entirely. Further improvements will likely be in the direction of increasing the speed of circulation of the stock and the rubbing surface by means of which hydration of the stock is obtained. By the use of a lava stone lining for the hood, and by bringing down the hood in front of the roll so as to return the stock immediately to the working space between the roll and the bedplate, the work of the beater might be done so quickly that the beater could be made continuous, the control being effected by adjusting the flow of stock to and from the beater. The recent researches of Miss Minor on the mechanism of beating are briefly summarized (see **Pulp and Paper,** xviii, 300, A-15, March 18, 1920, A-15, 497, L-5, May 6, 1920). Results of Kress and MacNaughton at the Forest Products Laboratory, Madison, Wis., and unfinished experiments being carried out at the Forest Products Laboratories, Montreal, Canada, tend to show that the production of a beater, other things being equal, is in proportion to the weight of fiber which passes under the roll per min., and that in any one beater the production per h.p. is constant over a considerable range of consistencies.—A. P.-C.

K-10. Rosin-wax Sizing Process. Can. patent No. 207,336, JUDSON A. DECEW, Montreal, Que., Canada, Jan. 11, 1921. A process which comprises incorporating with fluent paper stock, a sizing composition containing rosin size and wax, and an aluminium compound capable of precipitating the same, making the material into paper, drying the paper, and heating the same to a degree sufficient to melt the rosin oil alumina compound by passing the same between heated pressure rolls maintained at a temperature above 100° Cent., whereby the same molten material spreads itself, in fluid condition, throughout the body of the paper.—A.P.-C.

K-10. Aluminium Rosinate Sizing Process. Can. patent No. 207,337, JUDSON A. DECEW, Montreal, Que., Canada, Jan. 11, 1921. A process of sizing paper stock, which comprises treating the same in a fluent

(Continued on page 674.)

PULP AND PAPER NEWS

The fat is now fairly in the fire, so far as the printing strike in Toronto is concerned. Last Friday, the employing printers, at a meeting held in the Methodist Book Room, Toronto, unanimously reaffirmed their opposition not only to wage increases, but also to the forty-four hour working week and to the open shop. They, further, announced their intention of having no individual dealings with the unions. The negotiating committee, which, had been appointed, reported to the meeting in question that it had done all it could to reach a settlement of the question involved, but without avail, and it accordingly resigned as there seemed no further object to be gained in longer keeping it in being. Thus the issues are definitely joined. The breach between the employing printers and the strikers seems to have widened since the commencement of the strike. It now appears likely that the dispute will be a protracted one. Both parties evince a determination not to give way. One curious by-product (so to speak) of the strike should be noted, as it is unquestionably having the effect of hardening the employers' attitude of opposition to the strikers' demands: The employers claim that the contention that operation under strict trade union regulations restricts production is now receiving practical demonstration. One firm reports that, though operating on a reduced staff, by reason of the strike, its production is at normal. This claim is attracting a good deal of attention among employers in Toronto outside the ranks of the employing printers. The matter is one as to which we shall hear a good deal in the future.

Considerable interest, not unmingled with anxiety, is being evinced in pulp and paper circles—and, indeed, in commercial circles generally—in Toronto and district, as to whether the millions urgently needed to prevent liquidation on the part of the Riordon Company will be forthcoming. One big financial man, with an unsurpassed knowledge of Canadian commercial and industrial conditions expressed himself, this week, to the writer as being extremely apprehensive of what the sequel might be if liquidation should ensue in the case of this Company. "I am not speaking unadvisedly," he remarked with emphasis, "when I say that it is quite on the cards that liquidation in this case might be but the precurson of a number of business failures. For it is a salient and significant factor of the situation that more than $3,000,000 worth of unsecured debts are included in the Company's liabilities. Not all of the unsecured creditors may be strong enough in the financial vertebrae to be able to bear the heavy losses which would probably result from liquidation. Especially is this the case just now when many businesses are finding it all they can do to carry on at all in the face of such widespread business depression." That is one aspect of the matter. But, beyond that, it is felt by those whose finger is on the pulse of commercial conditions that the failure of a pulp concern of the dimensions of the Riordon undertaking would react most detrimentally on the pulp and paper industry, as a whole, inasmuch as it would tend seriously to impair public confidence in that industry's strength and stability. Not only so, but since the pulp and paper industry has now achieved so leading a position among the basic industries of this country, the failure of this concern would deal a blow to Canadian industry generally.

Last week, a block of Riordon timber limits, eighty square miles in extent, north of the Ottawa river to the west of Ottawa, was sold to Ottawa interests at $3,000 per square mile, making a total of $240,000. It is understood that one or two other small areas of the Riordon timber limits are under option to lumber interests, but sales have not at the moment of writing been made.

Representatives of the Spruce Falls Pulp and Paper Company, headed by the Hon. W. D. McPherson, waited on the Hon. E. C. Drury, Premier of Ontario, last Thursday. This Company had entered into agreement with the Ontario government with respect to paper mill and other construction on the townsite of Kapuskasing, in Northern Ontario. It is reported that, among other representations made to the Ontario Premier by the Company's spokesmen, it was alleged that the expenditures necessary to plant establishment had actually been four times the amount originally contemplated; and the Company asked for concessions with respect to time limits for manufacturing, should it find it impossible to comply with the time limit which ends on the 1st January. The Company was promised every consideration. It is said that work on the plant has been slowed up now for some time, and that active operations are being carried on only on the sulphite mill.

One cannot fail to be impressed with the very general sense among manufacturers in the Toronto district —and not least among those engaged in any branch of the pulp and paper industry—of the imperative need of industrial research in this country, and with their keen disappointment at the Senate's action in killing the bill for the Industrial Research Institute, last session. The general opinion among manufacturers undoubtedly is that, while manufacturers can fairly be expected to do some of the necessary research work themselves, yet the inspirational, as well as practical, results which would accrue from the activities of a central Research Institute, working along scientific and co-ordinated lines, would be an inestimable benefit to the industrial life of the country—especially at this stage of its partially arrested development.

UNDERWOOD RESOLUTION UP AGAIN.

A resolution by Senator Underwood, Democratic Leader in the Senate, creating a Federal Commission to confer with the Canadian Government on revocation of orders restricting wood pulp exports to the United States, has been favorably reported by the Senate Rules Committee. Five commissioners would meet representatives of the Dominion Government and the Provincial Governments of Ontario, Quebec and New Brunswick. If an agreement could not be reached, the commission would recommend action by Congress.

UNITED STATES NOTES

Labor troubles in and about Green Bay, Wis., are practically at an end. With the single exception of the Green Bay Paper and Fibre Company, whose mill is still tied up by a strike, difficulties that have interfered for weeks with operations in some of the larger mills, have been settled. The latest settlement reported from Green Bay is one affecting the plant of the John Hoberg Company. Operations were resumed in this company's mill a week ago when the striking employees returned to work under an agreement whereby they accepted a wage reduction of 16 2-3 per cent. It was said that the agreement was very similar to that accepted by striking employees of the Northern Paper Mills, which resumed operations a week before, after being hampered by a strike for more than twelve weeks. An early settlement of the Green Bay Paper and Fibre Company employees' strike is expected.

Officials of leading Maine pulp and paper establishments and a number of prominent foresters of the State have organized a forestry club, to be known as the Penobscot Forestry Club. The organization was effected at a meeting held recently at the Chamber of Commerce, Bangor, Maine. D. A. Crocker of the Eastern Manufacturing Company, was elected president, R. E. Pineo of Milo, timberland dealer, was elected first vice-president, H. B. Morse of the Orono Pulp and Paper Company, second vice-president, Shirley Rogers of the Northern Paper Company, third vice-president, and P. T. Coolidge of Bangor, Me., forestry engineer, secretary and treasurer.

Two bills are before the present session of Congress aiming at forest protection, but neither one is likely to pass without a sharp fight. One measure leaves protection to the States and one puts it on the national Government. In reality, both groups of conservationists believe sound policy would favor government control, but one of them accepts state control in order to overcome the opposition of the three great lumber producing States of Washington, Oregon and California.

The Forest Service of the United States Department of Agriculture gave a very succinct summary of the forestry situation in the United States in a statement it sent out broadcast in connection with the recent country-wide observance of Forest-Protection Week. "Three fifths of the original timber supply in the United States is gone," read the Forest Service statement. "There is now consumed annually more than 51 billion board feet of material of saw timber size, and nearly 5 billion feet is destroyed by fire, insects and other agencies. Our depleted forests are growing less than one-quarter of this total amount. Not only are the remaining virgin forests being cut heavily, but we are using up the second growth and small material on which depends our future supply. In all, the requirements of our population are close to 300 board feet per capita. The answer to the forestry problem is not to use less wood, but to grow more—to put our idle acres to work producing trees. The crux of the problem lies in preventing forest fires."

A. B. Borregaard, of Chistiana and Sarpsburg, Norway, one of the leading Scandinavian pulp manufacturers, is establishing an agency in New York City. Anthon Olafson, a director in the concern and also President of the Poland Paper Company, will be the executive head in the new branch office. The Borregaard Company has pulp mills in Norway, Sweden, Austria and England. Its reputation in the United States has been established through the extensive sale of its products on this side of the Atlantic for more than a score of years. Mr. Clarence P. Robinson has left a place in the chemical and pulp departments of Daniel M. Hicks, Inc., to take the position of manager of the sales department in the new agency. The opening of offices in New York marks the carrying out of Mr. Borregaard's idea that to do so would afford the means for dealing direct, giving the mills the lowest possible price consistent with the quality of the products, and at the same time, giving an opportunity for more intelligent co-operation.

Donald D. Conn, who is in Washington on behalf of the Northwestern Lumber Retailers and Manufacturers, has compiled data to show that the imposition of a tariff on lumber, pulp and pulpwood will prove detrimental to the trade interest of the United States. "The growth of Canada has been great and our exports to Canada have grown from $47,735,679 in 1873 to $801,100,700 in 1920," Mr. Conn states. "In 1919 the United States shipped to Canada 81.5 per cent. of the foreign purchases in that country. The large exports of United States products to Canada covered practically every branch of industrial endeavor in the United States. To cut off the exportation of lumber from Canada to the United States, which the proposed 25 per cent. ad valorem tariff on dressed lumber would do, would only serve to make it impossible for Canada to exchange commodities for commodities, and as a result our trade with that country could not be maintained on a sound economic basis. Such items as lumber, pulp, pulpwood, etc., which the United States is in dire need of, while depleting our own natural resources, should not be restricted in their movement from Canada, first because of our own selfish motives to obtain these products which can go to equalize the United States proportion of imports that Canada purchases."

A lease, giving access to one of the finest pulpwood tracts in the Adirondack region to the Hinckley Fibre Company, was signed last week by the Adirondack League Club and representatives of the paper company. A total of nearly $500,000 is understood to be involved in the deal which covers the lease of rights to cut valuable pulpwoods for a period of twelve years. The deal has been under consideration for over a year. The Hinckley Fibre Company will be assured a steady supply of pulp during the period over which the contract extends. Its supply of this necessity had become almost exhausted. The company is controlled by H. L. Paddock, and interests identified with the Oswego Falls Pulp and Paper Company of Fulton, N. Y. The latter concern will also be supplied from the Adirondack tract. The Adirondack Club will still occupy the tract, and it has been stipulated in the agreement that the cutting shall be done in conjunction with proper reforestation measures so that the scenic beauty of the section will in no way be impaired.

(Continued from page 671.)

condition separately with a solution containing a soluble aluminate and with a dilute solution of rozin size containing free rosin acid, the solutions being diluted to such an extent that the free alkali in the aluminate solution will not saponify the free rosin acid in the soap solution. See also Fr. patent No. 499,415, May 12, 1919, **Pulp & Paper,** xviii, 756, July 15, 1920.—A.P.-C.

K-12. Paper Web Carrier from Driers to Calenders. Can. patent No. 206,167, CHARLES E. POPE, Springfield, Mass., U.S.A., Jan. 4, 1921. The combination with the drying rollers and calendering rollers of a paper machine, and a scraper cooperating with the last of the drying rollers, of brackets attached to the machine forms and guide plates supported by said brackets arranged to form a guiding passage between said rollers, having an inlet opposite the scraper, and an outlet at the bite of the calendering rollers, and terminating remotely from the last drying roller to provide an open-ended unobstructed vertical space there-between, means for delivering currents of air at said scrapers for blowing a lead strip of the paper web across said space into and along said guiding passage and means for delivering other currents of air into said guiding passage above the aforesaid air currents, said air-currents being directed in the direction of movement of said strip and supporting the strip as it is moved along.—A.P.-C.

K-12. History and Future Development of Paper Machine. STUART D. LANSING. **Pulp and Paper,** xix, 109-11 (Jan. 27, 1921; **Paper,** xxvii, 23 (Feb. 9, 1921). Brief history of the evolution of the paper machine, and especially of the progress accomplished during the last thirty years or so. L. prophesies that paper will be made at 1,500 to 2,000 ft. per min. within a relatively short time, and that width and speed can be combined in one machine.—A. P.-C.

K-12. Grooved Press Rolls. Can. patent No. 207,483, AKTIEBOLAGET KARLSTADS MEKANISKA VERKSTAD, assignee of RUDOLF ERNST WAGNER, both of Karlstad, Sweden, Jan. 11, 1921. A roll comprising a roll body, and a roll jacket around said body provided with generally longitudinal grooves in its inner surface, and with circumferential slots in its outer surface, said grooves and said slots having such depths as to reach one another.—A.P.-C.

K-12. Cylinder Mould for Paper Machine. Can. patent No. 207,057, REGINALD RICHARDSON and JAMES L. KEY, co-inventors, both of Overton, England, Jan. 4, 1921. In a cylinder mould for paper-making machines, the combination shaft, a plurality of longitudinally arranged bars mounted for radial movement on the frames, a mould cover supported on said bars, and a ratchet wheel supported on one of said frames concentric with said mould cover adapted to engage said bars, said ratchet wheel being rotatably adjustable to actuate the bars.—A. P.-C.

K-12. The Hardy Stock Regulator. Pulp and Paper, xix, 147 (Feb. 3, 1921). Description of the Hardy regulator and of its method of operation.—A. P.-C.

K-12. Speed Interlock as Applied to the Paper Machine. F. G. WARBURTON, **Pulp and Paper,** xix, 59-64 (Jan. 20, 1921); **Paper,** xxvii, 22 (Feb. 2, 1921). An analysis of belt and rope drives on paper machines, showing their defects and the advantages of the electric drive, provided the relative speeds of the motors driving the different sections of the paper machine can be satisfactorily regulated. The interlock of speed control (particularly as installed in connection with the new Laurentide machines) is described in detail and its method of operation is fully explained. The efficiency of the speed regulation by this system was proved on Laurentide's No. 8 machine, when the speed was rapidly raised from 600 to 950 ft. a min. without breaking the sheet.—A. P.-C.

K-18. Fibers for Making Rough Pasteboard. Can. patent No. 207,131, RUDOLPH KRON, Gerseau, Switzerland, Jan. 4, 1921. A process for making cheap fibers which felt together not too densely, producing an absorbent spongy sheet sufficiently durable for application to the manufacture of rough pasteboard to be saturated with tar or bitumen for roofings, linings, or the like, which process consists in converting logs or other relatively large pieces of wood or ligneous or strongly siliceous plants into fibers without the use of alkalis or acids, by boiling with water or by steaming and subsequently rolling out, crushing, and grinding so as to obtain the natural cellulose fibers without deterioration and not weakened by chemical agents.—A.P.-C. (Same as Fr. patent No. 493,387. See **Pulp and Paper Mag.,** xviii, 58, Jan. 15, 1920).

K-18. Fiber-faced Concrete Wall. Can. patent No. 207,274, BROR GUSTAV DAHLBERG, assignee of HERBERT A. SULLWOLD, both of St. Paul, Minn., U.S.A., Jan. 4, 1921. The process of making a wall or roof of concrete which will be dripless on its surface which consists in providing a suitable form, placing the fibrous material known as "insulite" on the interior of said form, applying said concrete in a fluid condition directly to said insulite to form a bond therewith, and after said concrete has set removing said form, substantially as described.—A.P.-C.

L-6. Pulp Moulding Apparatus. Can. patent No. 207,534. The Keyes Fiber Company, Waterville, assignee of BERT R. WILLIAMSON, Fairfield, both in Maine, U.S.A., Jan. 11, 1921.—A.P.-C.

M.-O. Safety Valve for Pressure Cookers. Can. patent No. 207,103, WALTON C. FERRIS, Lincoln, Nebraska, U.S.A., Jan. 4, 1921. A safety valve for steam cookers comprising a bowl-shaped body having a valve-seat passage adapted to communicate with the cooker chamber and an external spiral thread, a cap fitted on the bowl and having a pin connection for engaging the spiral thread in the bowl, the said cap having a valve stem guide, a valve mounted in said guide and adapted to close the said valve seat passage, and a spring device connecting the valve with the cap whose tension is increased or diminished as the cap is screwed off or on the bowl-shaped body, the said body having provisions for the escape of steam, when the valve seat is open.—A. P.-C.

P-0. Tanks and Pipe Lines as Causes of Accidents. HOMER A. HOFFMAN, **Chem. Met. Eng.,** xxiii, 1023-5 (November 24, 1920). A study of the hazards involved in the use of storage tanks and pipe line distributing systems in chemical plants: together with a description of safe methods for the construction, cleaning and repairing of underground and overhead tanks and pipe lines.—A.P.-C.

R-12. Facts about Present Costs of Manufacturing Newsprint. Pulp and Paper, xix, 9-10 (Jan. 6, 1921). A review of the principal factors which affect the price of newsprint paper, including pulpwood, labor, transportation, mill supplies, losses and risks, showing that the economic readjustment which has been manifested in other industries is not yet evident in newsprint manufacture.—A.P.-C.

British Trade News

(From our London Correspondent.)

London, June 5, 1921.—The Anti-Dumping Bill, in which the British Paper makers want inclusion to save them from the debased exchange existing in Finland and Germany, was before the House of Commons during the past week. Several amendments were submitted and, notwithstanding opposition the Bill received a good Government majority. It is explained that a referee will be appointed who may decide the articles to come within the meaning of the Bill.

New Sunday Paper.

It is good to hear of new projects in these days of dullness and depression. The "Sunday Illustrated" is the title of a new paper which is to appear early next month. I am told that big plans are on foot for the venture and no expense is being spared. No doubt some of the newsprint sellers will benefit by the large circulation that is expected.

Thos. Owen & Co., Ltd.

The report of Messrs. Thos. Owen & Co., Ltd., Ely Paper Works, Cardiff, the big newsprint producers, states that the profit for the past year, after making due provision for taxation and reserves (and carrying £10,000 to the pensions fund) amounts to £25,113. After adding thereto the sum of £26,743 brought forward from last year there remained a balance of profit amounting to £51,856. From this interim dividends for the half year of 7½ p.c. free of tax on the ordinary shares and at the rate of 6 p.c. per annum on the preference shares have been paid, absorbing £17,250 and leaving £34,606 now available. The directors recommend that this be appropriated by the payment of a dividend of 5 p.c. free of tax on the ordinary shares, which will absorb £7,500 and a dividend for the half year at the rate of 6 p.c. per annum upon the preference shares, which will take £6,000. This will leave £21,106 to be carried forward.

The Miners' Strike.

There are no signs of the miners' strike coming to an end. Indeed the industrial situation is very grave just at the moment and the coal miners have been joined by half a million textile workers who object to their wages being cut down as the cost of living declines. There is also a feeling of unrest in the engineering trades. Many of the mills are now without coal and the work is suspended. So far no one seems to be able to patch up the difference between the coal miners and the mine owners. Between them they have dislocated all the trade of the country and nearly £40,000,000 has been spent on unemployment by those in authority. The whole atmosphere at present is unwholesome and the industries as well as the trade of the country are receiving a rude shock.

Newsprint Prices Down.

Producers of newsprint in the United Kingdom have decided to meet foreign competition by reducing their price. Quotations are now down to 5½ cents a lb. This means a serious loss as the paper is produced on pulp purchased at last year's rulings, and paper mill owners have no chance of recouping themselves in the face of foreign imports selling at less than the British cost of production.

Official View on Present Situation.

In the House of Commons Admiral Adair asked the President of the Board of Trade whether it is the case that the paper trade of the United Kingdom is seriously affected owing to the high prices of raw materials, chemicals and coal, and to the state of the exchange; whether the greater part of the paper mills are either shut or working very short time consequent on foreign competition, and, if so, will he consider including paper in the Safe Guarding of Industries Bill with a view to checking, at any rate, imports of paper from Foreign countries and so enable the British mills to continue in operation?

Sir P. Lloyd Greame, replying said a large number of paper mills are at present either entirely shut down or working short time, owing to the high cost of raw materials, the increasing supplies of paper imported from abroad and the decline in the demand. Insofar as foreign competition is from countries with depreciated currencies it is not intended to exclude from the provisions of financial resolution No. 2 relating to the safeguarding of industries any industries other than food industries.

Canadian Coal in England.

During the past week 5,600 tons of Canadian coal reached Hull. It will be used for industrial purposes. Further cargoes are on the water. This will give an indication of the state of affairs at present existing in the United Kingdom.

Lord Byng for Canada.

Canadians will be pleased to hear that Lord Byng has been selected as Governor-General of Canada in room of the Duke of Devonshire. General Byng commanded the "Byng Boys"—known as the Canadian Corps. During my service in France and Belgium, under General Byng, I met many Canadians who will be interested in the new appointment—and I am sure will give their old leader a Canadian reception.

SMOKE FROM THE PAPER STOCK FIRES.

There was strong suggestion, in evidence heard by the Fire Commission yesterday, as to the destruction of the premises of the Canada Paper Board Co., corner of William and Seigneurs streets, on June 4th, that the fire was caused, accidently or otherwise, by intruders getting into the place through the windows.

In fact, Mr. Robertson said that they had found it necessary to board up all the windows, and that the boards had been torn off by intruders on several occasions, his attention having been called to a repetition of this occurrence on the very day of the fire.

Mr. Robertson estimated the damage at $10,000 on the stock, covered by insurance, and $76,000 on the building, on which there was insurance of $45,000.

Found no Cause for Kander Fire.

No cause was ascertained for the fire which entailed a $10,000 loss in the premises of the Kander Paper Stock Co., 332 William street, at 12.08 a.m., June 7th.

The firemen stated that the second and third stories of the building were a mass of flames when they arrived on the scene and that it was impossible to decide where it had originated, although they inclined to the opinion that it was on the second floor.

Mr. Kander said they had $10,000 insurance on the stock. He mentioned that their present watchman, who had come well recommended, had succeeded one who was dismissed for sleeping at his post, about eight days ago.

Thumbed over by greasy, dirty hands, continually spattered by flying oil or water from the cutting tool, Production Tickets must be printed on strong, tough paper to withstand the wear. Writing Manilla fills the bill admirably.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 18th June.—Resumption of work at capacity at the plants of Price Brothers and Company and the Abitibi Power and Paper Company's plants is regarded as an encouraging development in the newsprint situation. For stocks had been running remarkably low by reason of strikes. At the end of last month, stocks were moving pretty freely out of the jobbers' hands, and this gave a considerably better tone to the market than had prevailed for some months previously. But this freer movement of jobbers' stocks seems to have been largely due to anxiety to get the printing jobs out before the strike, which is now on in Toronto and other places, became an accomplished fact. Thence, the better tone, which was observable at the end of last month, was of a spasmodic, and almost spurious, kind. And now that there is every indication here that the printers' strike, which it was at first anticipated would be settled in comparatively short order, may turn out to be a protracted affair, there is little present optimism in evidence among the trade as a whole. The resumption of work at the newsprint mills mentioned above should operate in the direction of obviating a rise in prices which would probably have come about had the complete shut-down continued for long. No further reductions are anticipated at present in the prices of book paper, bonds, ledgers and other standard lines. But the general condition of the market is dull and depressed.

PULP.—Some slight improvement in the demand for pulp has been evidenced just lately, but, on the whole, the demand continues to be of the "hand-to-mouth" description on which comment was made last week. The prevailing depression, alike in internal and in external markets, which characterizes nearly all businesses just now, is having its effect on certain grades of pulp and paper. Particularly is this the case with those which depend on publishing and advertising. The printers' strike is detrimentally affecting such lines, and, in addition, there is a tremendous falling off in the volume of general advertising owing to depressed business conditions. Some improvement, however, is to be noted in the kraft pulp situation.

TOILETS AND TISSUES.—In a talk this week with one of the principal manufacturers of toilets and tissues, the writer was informed that business in these lines can now be described as very good. Prices in these lines are today nearer to pre-war prices than in any other lines of paper. For example, the present price of 4 oz. toilet roll is $3.38 per case, delivered to delivery points, whereas the pre-war price of this line can be considered as having been about $2.80. The present tissue prices are as follows: No. 2 Manila tissue, 24 by 36, $1.30 per ream; Natural white, 24x36, $1.50 per ream; No. bleached white, 24x36, $1.95 per ream.

BOX BOARD.—There is absolutely no change in the box board situation, as reported last week. Prices continue the same. Things are moving slowly, and there is nothing much in the way of improvement in sight.

COATED PAPER.—On the whole, slackness continues to characterize the trade in coated paper. Some of the mills are reported to be doing a fair amount of business, though this is not the rule, and, even with these fortunate ones, the business done is too much on the light side. No substantial improvement in conditions seems to be expected in the near future.

WRAPPING PAPERS.—The tone of the wrapping paper trade continues much the same as reported last week. Prices remain unaltered and there is just sufficient business coming along to keep things moving slowly. Jobbers report some improvement in the demand in the rural parts.

MANUFACTURED STATIONERY.— The general tone of the business in manufactured stationery varies from the rather dull to the fairly satisfactory. Jobbers are, for the most part, buying only for immediate requirements, but many manufacturers are doing a fair amount of business, and there is a general anticipation that this will be considerably improved in three months or so.

RAGS.—The demand for roofing rags is the only substantial kind of demand in the paper-making rag market. The movement of this class of stock to the mills will probably be accelerated shortly, and, if so, there is likely to be a considerable rise in prices, as the stock of mixed rags is remarkably low.

NEW YORK MARKETS.

New York, June 18—(Special Correspondence)—The paper market has been essentially unchanged this week insofar as regards any important development or fluctuations in prices. That improvement is gradually taking place is evident on all sides, yet it must be said that buyers continue to proceed cautiously and that the pick up in trade activity is slow. Demand for certain kinds of paper is comparatively good; in fact, far better than it was not so long ago, but the aggregate movement of supplies into consuming channels is still considerably below normal and seems likely to remain so until next fall. Consumers in the United States of all descriptions of goods, whether it be paper or various other manufactured commodities, are not yet disposed to anticipate their wants, and are sticking to their policy of buying only as the need arises. As one of the leading bankers of the country stated several days ago, the business situation no longer hinges on the matter of prices—prices in most instances are today relatively below pre-war levels and in numerous cases under the cost of production,—but more on the need of a buying movement; of the regaining of confidence by the general public and a resultant willingness to look ahead and buy accordingly. That this condition will develop in due time is a consensus of opinion among business men, but it does not prevail as yet, and present indications are that it will take several months longer for the feeling of skepticism to be dissipated and the buying power be again instilled in the consuming public.

Further conferences have been held in New York this week between officials of the International Paper Company and representatives of the operativs in the mills of that company with a view of reaching a settlement



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in the strike situation which is holding the I.P. plants at a standstill. According to an announcement made last night, no decision has yet been reached, though it can be stated that matters look favorable for an early solution of the labor difficulty and a resumption of operations at the newsprint mills. There is little question that if the International comes to an agreement with the strikers that other newsprint manufacturers will fall in line and adopt similar measures toward ending the strike in their plants, so that the entire industry is intently watching the outcome of the conferences in this city. (Later: No agreement was reached.)

A fairly steady tone prevades the newsprint market. Consumption is declining somewhat, which is usually the case at this time of the year, but there is moderate activity in the open market while shipments on contract are moving forward regularly. Spot prices are holding at around 5 cents per pound on newsprint in standard rolls for prompt delivery, and although occasionally sales are reported at less than this figures, there is not much supply to be had at the cheaper prices. Sheet news is in rather slack demand and is quoted at about 5.50 cents on contract and at around 5.75 cents in the open market.

Fine papers are gradually showing more life but current buying is confined almost exclusively to immediate requirements, and writing paper mills are far from busily engaged. It is difficult to name prices on fine papers as quotations are so irregular and on such a broad range. A fairly good grade of sulphite bond can be purchased today at 12 to 15 cents per pound, while ledger papers are available at from 13 cents upward, with between 18 and 20 cents an average of quotations.

There is nothing of note new in the book paper trade. Mills are running chiefly on contract commitments and are quoting approximately the identical prices previously reported. Wrappings are in moderate demand and No. 1 domestic kraft wrapping is quoted at 6.50 to 7 cents per pound at the mill. Tissues are favored with considerable demand, especially coarse grades, and quotations rule steady.

Boards are firming and are moving in larger quantity almost every day. Prices on box boards evidently are at rock bottom and this apparently is attracting buyers, who are laying in supplies not only for immediate wants but also to cover forward needs. Plain chip board is quoted at $35 a ton at mills by a majority of producers, with transactions reported ranging down to $30, while filled news board is bringing from $32.50 up to $37.50 a ton f.o.b. mills.

GROUND WOOD. Open markets trading in ground wood is of rather limited dimensions. Buyers are coming into view off and on and are absorbing fair-sized amounts of pulp, but in the aggregate business involves a comparatively light tonnage of ground wood. One reason for this apparently is that consumers look for the strike of newsprint and pulp mill workers to be settled soon, thus leading to a larger available supply of mechanical pulp, which prompts them to hold aloof in covering other than direct requirements. Board mills are among the leading buyers at present in the spot market. Prime spruce ground wood is fetching around $30 a ton f.o.b. grinding plants, with occasional sales reported at a few dollars under this basis. It is stated that Swedish manufacturers are offering ground wood at prices comparing very favorably with domestic quotations, and that some orders are being placed on the other side for pulp for shipment to this market.

CHEMICAL PULP.—Prices on chemical wood pulp are easy and, according to reliable information received in the trade, are sagging off to lower levels. Bleached sulphite of domestic origin, it is stated, is being offered in some quarters down to 5 cents per pound at pulp mills, while reports have been heard of sales of domestic easy bleaching sulphite at less than 4 cents, of news grade sulphite at 3.50 cents and of domestic kraft pulp at close to 3 cents a pound. Quotations on foreign pulps are proportionately down, bleached sulphite being offered at 5.50 cents and less, easy bleach at 4.50 cents and kraft at 3.50 cents ex the dock on this side. The downtrend in prices naturally is causing paper manufacturers to refrain from buying unless in pressing want of supplies. Now and then reports are obtained of orders being placed in Sweden or Norway, but little buying of consequence is being done by Americans in Scandinavia, while demand for domestic pulp is of rather narrow compass. There are many who believe that pulp prices are near the bottom, yet few consumers appear willing to back up this belief by placing orders for sizable tonnage.

RAGS.—The paper making rag market is far from active. In some respects, particularly as regards roofing stock, there is a fair volume of business current, but taken as a whole the market is devoid of notable activity. Quotations on roofing rags are firm and incline upward, with dealers asking 90 cents to $1 per hundred pounds on No. 1 packing and 75 to 80 cents on No. 2 packing, but other grades mostly tend lower and buyers have no great difficulty in getting supplies at recessions from the figures named by packers. New cuttings are especially weak, and offerings have been

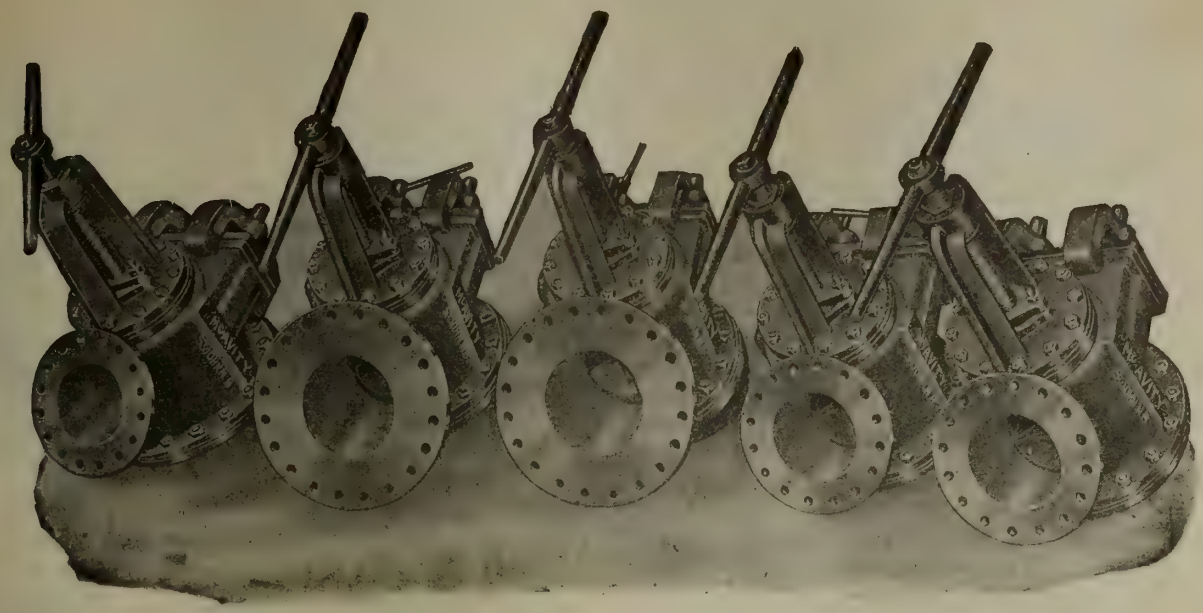
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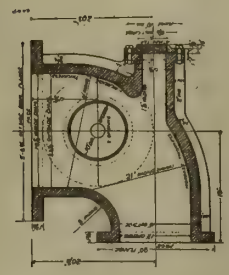




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reported at the following levels: No. 1 white shirt cuttings, 9 cents a pound; fancy shirt cuttings, 5.75 cents; blue overall cuttings, 6 cents; new light silesias, 5.75 cents; unbleached muslins, 8 cents, white lawns, 8 cents, and washables, 4.50 cents. Old No. 1 repacked whites are offered by dealers at 5.25 cents with few takers, while repacked thirds and blues are available to mills at 2 cents and less.

PAPER STOCK.—Old paper prices rule fairly steady and some grades which are in extra good demand and which are in apparently light supply are moving upward in value. No. 1 old kraft is a particularly strong item, and dealers assert they are refusing to accept mill orders at 2 cents a pound f.o.b. New York, asking 2.25 cents, while white news cuttings are held a around 1.75 cents at shipping points. Shavings are relatively firm in price at 2.25 to 2.50 cents on No. 1 soft white and around 3 cents on No. 1 hard white, while old flat magazines are quoted at a cent per pound. Mixed paper is bringing 30 cents a hundred at shipping points and is moving in slightly larger tonnage, whereas folded newspapers are scarcely wanted and are available at close to the same price named on mixed stock, offerings by dealers at 35 cents being quite numerous.

OLD ROPE AND BAGGING.—Paper mills have let up in their buying of old rope but dealers appear to have old commitments to cover and prices hold steady at an average of 4 cents per pound at shipping points for manila rope in No. 1 condition. There is no improvement in scrap bagging and prices are strictly nominal, with offers of No. 1 scrap freely made at a cent to a cent and a quarter per pound. Gunny also is dull and uncertain in value.

News From Our Advertisers

HAVE GREAT FAITH IN CANADA.

Something of the Plant and the Product being turned out by the Niagara Wire Weaving Company, Limited, at Niagara Falls, Ont.

The modern factory of the Niagara Wire Weaving Company, Limited, at Niagara Falls, Ontario, completed last year, is the result of a United Sttes' manufacturer believing in the future growth of Canada and wishing to serve the enormous Canadian trade they had built up during the past years, from a central plant right on the ground.

In 1919, Mr. Hamilton Lindsay, President of the Lindsay Wire Weaving Co., who is one of the most widely known and best informed men in this industry, organized the above company. He personally supervised the construction and equipping of the new plant, incorporating therein all the latest methods and machinery which were the results of years of experience and improvement in the Lindsay Wire Weaving plants.

The first unit was started in the fall of 1919 and completed in March, 1920. It is of full mill construction, 232 x 80 feet, two stories, with wings. In designing the building emphasis was placed on light conditions and the placing of the machinery in positions to produce best results.

In starting operations five looms were brought from the Lindsay Cleveland plant in sizes up to 240 inches. In the Canadian Company's own machine shop at the plant additional looms have been built continuously since that time, until to-day two-thirds of the unit is equipped, and the balance of the machinery is in process of construction and erection.

The Company were fortunate in being able to draw on the parent company for the experienced help and for the heads of its various departments. The manager, Mr. E. J. Buell, is a graduate of the Case School of Applied Science in Mechanical Engineering, and held a responsible position for some time in the Lindsay plant at Cleveland.

With the most modern machinery and experienced help the Company is turning out a high grade product in every respect. From the time the wire is received in the factory till it goes out in the finished product, every effort is made to retain the life in the wire and send out a product that will give large tonnage and long service to the user. Throughout the entire process the wire is subjected to rigid inspection. After it is completely woven and seamed, it is run through a special finishing process taking from three to four hours, so as to be sure that the wire runs true and to avoid any possibility of a defective wire leaving the factory. Extra large cores are used so the wire will



Plant of Niagara Wire Weaving Co.

lie as flat as possible when it is put on the machine in the mill. In packing especially heavy boxes are used to prevent springing, and the whole is encased in felt to protect the surface of the wire.

The Company's product includes Fourdrinier Wires Cylinder and Washer Wires and Dandy Covers, as well as all grades of brass and phospher bronze wire cloth which is used in connection with the making of paper. The wires are made in any width up to 240 inches, which will accommodate any present or proposed paper machine in Canada. The Company also carry large stocks of cut cloth in meshes from 14 to 100, so as to be in a position to give immediate shipment to the Canadian paper mills.

The National Aniline & Chemical Co. has brought out a new dye called Niagara Blue R, which is suitable for coloring paper, chip board, etc.

Owing to increased activities and extension into a fully equipped engineering works manufacturing all classes of steel plate work and handling mechanical repairs of every description and also boiler repairs, the St. Lawrence Welding Company have in order to make their name more representative of the field they are covering, changed their name to St. Lawrence Welding & Engineering Works, Ltd. No change will take place in the personnel of the firm. A. M. Barry, Vice-President and General Manager, remains in active charge. The head office and works are located at 138-140 Inspector St., ontreal.



Passenger Car Shop



On the Angus Shops of the C.P.R.—

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Left: Freight Car Shop

Below: East End Extension of Passenger Car Shop



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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., June 30th 1921. No. 26

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

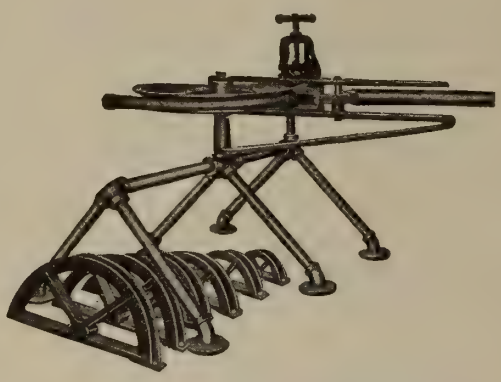
J. NEWELL STEPHENSON, M.Sc., Editor.

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EDITORIAL

TIME TO GET READY.

A year ago few people thought possible the rapid and general depression that has such an unfortunate effect on general business conditions in Canada and the United States. Even in Great Britain and Europe there were hopes that a recovery would progress in a satisfactory manner. The delay on the part of Germany to accept the inevitable results of her military failure and to begin payment of the indemnities fixed by the Allied Commission has seriously retarded the stabilization of European business and economic conditions. The out-cropping of old jealousies in Southeastern Europe, besides the depreciation of currencies practically throughout that continent, as well as in India, and the difficulty of arranging credits with Australia have all been factors tending to increase the difficulties of carrying on the usual volume of international trade. In Great Britain, where Canada had reason to expect an increase in general business, and particularly in pulp and paper dealings, there has been a most unfortunate upset in general conditions brought about to some degree by the factors just referred to, but precipitated and aggravated by the stoppage of coal mining and the consequent disruption of nearly all manufacturing operations.

The effects of the war are by no means over, and the past six months have seen a great deal of suffering on the part of the working man and enormous losses to manufacturers and merchants. The world generally was pretty well stocked up with high priced materials, the cost of which was principally the result of high wages paid during the war. European countries found that with their depreciated currencies they could undersell the product of labor in foreign countries. The threat of this competition and the rather rapidly increasing supply of labor foretold the necessity of wage reductions. The idea of decreased earnings while the price of commodities remained high brought about a general decrease in purchases, and this very soon was reflected in diminished manufacturing operations and consequent increases in unemployment. Along with this came a restriction of credit and the abandonment of construction work and planned extensions. The curtailing of such operations was also influenced, and is still influenced, by the attempt to maintain wages at war levels.

Conditions have shown marked improvement since last spring, due principally to the recovery of confidence on the part of the public. There is, however, a long way to go. It is quite generally expected that trade will pick up noticeably during the fall. We can all help to bring about the recovery by going on as if we fully expected conditions to continue to improve. It is only by taking such an attitude that conditions will improve. With the return of confidence, and in the anticipation of something akin to prosperity, we may expect money to be more easily available. This will mean that construction programs can be proceeded with and building operations go forward. It is not too late to start building now, and anything like a general resumption along these lines will be like the casting of a stone into a smooth pond of water—the ripples extend to the shores on every side—and activity and employment will increase in all lines of industry. A reduction in wages to a degree dependent upon the ability to sell the product of labor in competition with conditions elsewhere does not mean that it is done for the selfish profit of the manufacturer but may, and should, mean that it is his last step in bringing his business to a condition where he can afford to resume operations and give employment to something like a normal force.

Nobody wants to experience another winter and spring like the seasons just past. There is bound to be some lag in the general recovery of business and consequently considerable unemployment and hardship. All this, however, can be materially alleviated by immediately giving thoughtful consideration to measures for increasing opportunities for labor, and thus starting in motion again the unending cycle by which money earned and spent by each will gradually find its way around the whole circle of business relationships and transactions and come back again to the starting point. Both the manufacturer and user of paper has his part to play in the general scheme of modern business. It is to be greatly hoped that each one will do his part to bring about better conditions during the coming winter by taking careful thought and making careful plans now.

EMBARGO RESOLUTION BACK AGAIN.

It is with no great surprise that we learn that the United States Senate has passed a resolution authorizing the President to open negotiations with Canada so as to bring about, if possible, an arrangement whereby pulpwood may flow unrestricted to the mills across the line. The measure has been sent to the House of Representatives where it will undoubtedly be passed without any great objection. Practically the same bill was passed by the last congress, but failed to become

a law because it was not signed by President Wilson. There is hardly any doubt that President Harding will complete the steps necessary to its enactment.

That, however, is but the first step in proceedings. We fail to understand how there can be any hope of ultimate success in such an undertaking. A commission will doubtless be appointed, and they may visit the Provincial and Dominion authorities considerably to their enjoyment, but also at considerable useless expense to the United States Government. The attitude of the Provinces in regard to restrictions on pulpwood cut on crown lands has been plainly and forcefully stated by the authorities on numerous occasions. The tendency is rather to tighten up than loosen up on the regulations. It is a point in human psychology that arguing a matter frequently results in even firmer conviction that one is right in his opinion. That is quite likely to be the case in arguing the matter of pulpwood exportation. The more light that is thrown on the conditions of the forest and the present and future drains on this great natural resource of the Dominion will most certainly result in strengthening the attitude of the Provincial Governments toward careful conservation of Canadian forests. In fact, it will be very surprising if a discussion of this matter does not result in going beyond the restrictions already imposed upon crown land wood and laying an export tax on pulpwood cut from freehold lands.

It is absolutely necessary to Canada's future that the forests be maintained at their highest state of efficiency, and this will require the expenditure of far larger sums in administration and protection than are being spent at the present time. An export tax will be a considerable source on such income. The final argument to our mind against the advisability of reopening the pulpwood discussion at the present time, is the nature of the permanent tariff bill which is now before the Congress of the United States. The provisions of that bill, as predicted in reports, are not likely to put Canadians in a frame of mind where they will be in favor of voluntarily giving any ground whatever in the way of letting down on the regulations with regard to exporting pulpwood.

COBWEBS.

A humble suggestion to the Salons in London: The British paper mills are threatened with extinction because foreign paper is placed on the English market at prices below the domestic cost of production. Since a maximum price was set during the war, why not take the war's effects into consideration and now fix a minimum price that will give the mills a "living wage?"

Imports of woodpulp into the United States for April were only about half the amounts a year ago.

Friend Beck writes on a post card showing a street in Ornskoldsvik, Sweden: There is a large sulphite mill here, with what is said to be the biggest digester in existence—capacity 25 tons, also a couple of revolving digesters. They have 10,000 tons of bleached sulphite stored up and no market—conditions typical of the trade here.

The Broke Hustler says that Arthur Hoyt caught a fish that "ran over 3 feet and weighed over 20 pounds." We don't believe a fish can run.

The Federal Trade Commission says that 4,968 machine hours' lost time in newsprint mills in May, due to "Other reasons," includes 5,030 hours due to labor conditions.!

In our story of the Technical Section trip, we neglected to mention that the official welcome to Grand 'Mere was extended by Mr. F. A. Sabbaton. He expressed at the dinner what everybody had been doing all day for the visitors. On the same occasion, Mr. John Stadler, of the Belgian Industrial Company, intimated that there would be something doing in Shawinigan Falls. He is some prophet; perhaps his altitude gives greater vision.

Exports of newsprint to the United States in April, 1921, were 56,883 tons, only 422 tons less than in April, 1920. The total was 64,783 as against 60,098 a year ago, due to heavier shipments from Germany and Scandinavia.

320 TONS A DAY AT LAURENTIDE.

Mill production at Grand Mere went forward still another notch during May, to the greatest output yet recorded there, when an average of 320 tons of newsprint daily was established on all machines. This exceeds the best previous figure, that for April, by about 12 tons a day. The increase was chiefly to enhanced efficiency on the part of the new machines, numbers eight and nine, which accounted for 100 tons of the the daily production between them. For several days the two big creations turned out nearly their maximum capacity, or at the rate of about 140 tons daily. In April, these machines averaged a total of 100 tons daiy.

The efficiency leadership went to number seven with 90·9 per cent, with number five in second place with 90·3 per cent. Number nine led the new machines with 75.7 per cent, with number eight at 65.9 per cent.

WHO WANTS A PICTURE?

The picture of the group of technical section delegates at Shawinigan Falls is fine. We are advised that copies can be had at one dollar each. Send your greenback to Mr. Daucey, Belgian Industrial Company, Shawinigan Falls, Que. The picture will be reproduced in Pulp and Paper Magazine next week.

Grinding Tests of Average Infected and Sound Pulpwood*

By JOHN S. BATES.

The mill experiments described in this paper were carried out in May, 1920, at the Jonquiere Mill of Price Brothers & Co. Limited. The main object was to compare the yields of groundwood pulp from average, infected and sound pulpwood. At the same time various measurements of the wood and tests of the pulp were made.

During the week previous to the runs over five cords each of infected wood, sound balsam fir and sound spruce were sorted from the regular supply coming from the block pile. The two-foot blocks had been stored for about a year with some of the bark still on. The selected rotten wood was discolored brown to the extent of perhaps 35 or 40 per cent of the total wood mass, although no particular estimations were made. Some punky blocks were present, but in general the infected portions were still firm. Heart rot was the most common, while sap rot was noticed in some cases where the bark had remained on the blocks. Nearly all the sorted rotten wood proved to be balsam fir, so that true comparison should be with sound balsam fir. The average wood used for comparison was about half balsam fir and half spruce, with perhaps 5 or 10 per cent of the total mass showing signs of infection.

* This is the second paper on the use of decayed pulpwood. The next will be "Cooking decayed wood by the Soda Process", by E. Sutermeister.

On the day of the tests the sorted piles of special wood went in turn to the knife barkers and from there to the grinder room. The first run was made on regular average pulpwood already in the grinder room. Five cords of rossed wood were ground in each run. These cords were measured in the regular racks, each of which was supposed to represent one-quarter of a cord. Of the twenty racks of wood used in each case about six were specially examined. The two-foot blocks were first counted and then weighed twenty or thirty at a time on a Fairbanks scale. Each block was immersed in water held in a special cylinder to determine the solid volume directly. As less than one-third of the wood was measured in detail, some of the average figures are not very accurate. To obtain an idea of moisture content, blocks were taken at regular intervals from the conveyor and a disc sample of each block was cut by circular saw for oven-drying, although this method of sampling was not as fair as might be desired.

Six grinders were employed and records of the grinding conditions were taken. The pulp was pumped as usual through the bull screen and rotary screens, the tailings being refined in a Jordan. The "regular" pulp of Nos. 1 and 2 grades was weighed in laps from the wet machines, while the screenings were weighed in laps from a separate wet machine. The pulp was sampled throughout for average moisture content in order to

WOOD AND PULP MEASUREMENTS.

	Run No. 1 Average Wood	Run No. 2 Infected Wood	Run No. 3 Sound Balsam	Run No. 4 Sound Spruce	Runs Nos. 3 & 4 Combined
WOOD USED.					
Species, approx. balsam fir, %	50	95	100		50
Species, approx. spruce, %	50	5		100	50
Measured wood, cords	5	5	5	5	10
2-foot blocks per cord	246	212	196	174	185
Estimated average diameter, inches	6	6.5	6.7	7.1	6.9
Solid volume per cord, cu. ft.	90.0	89.0	92.2	87.9	90.0
Wet weight per cord, lbs.	4026	3858	3884	3985	3935
Average moisture, %	47.2	51.9	50.2	41.1	45.6
Oven-dry weight per cord, lbs.	2130	1855	1940	2340	2140
Oven-dry weight per cu. ft., lbs.	23.6	20.8	21.0	26.6	23.8
Oven-dry weight per standard cord of 95 solid cu. ft.	2245	1975	1995	2530	2260
PULP YIELDS.					
Air-dry regular pulp per cord, lbs.	1934	1696			1870
Air-dry screenings per cord, lbs.	221	238			325
Total air-dry pulp per cord, lbs.	2155	1934			2195
Total air-dry pulp per standard cord of 95 solid cu. ft. lbs	2273	2064			2316
Yield of total oven-dry pulp based on over-dry wood by weight, %	91.1	93.9			92.3
Freeness tests at 0.4% and 20° C. Unscreened stock from grinders		196	270	180	
Screened stock to wet machines	87	98	116	91	

GRINDING CONDITIONS.

	Run No. 1 Average Wood	Run No. 2 Infected Wood	Run No. 3 Sound Balsam	Run No. 4 Sound Spruce
Six stones (5 Lombard, 1 Empire) each given one burring during the day.				
Average diameter 45.3 inches.				
Average speed of stones, r. p. m.	240	258	257	256
Average water pressure, lbs. per sq. in.	52	54	53	53
Average temperature of pulp in grinder pits, ° F.	157	160	153	146
Total time of grinding, hours	3	2¼	2½	3½

calculate the weights of air-dry pulp (10 per cent moisture). No measurements were made of bull screenings and white water losses. After each run the system was allowed to wash clean, but sufficient time was not allowed after the third run so that the pulp yields from sound balsam fir and sound spruce had to be combined in the calculations.

The quality of pulp in each case was determined by general appearance, microscopic examinations, freeness tests and action on the paper machine. The freeness tests were made in the Green drainage tester at an oven-dry consistency of 0.4 per cent and a temperature of 20 degrees Centigrade. The paper machine trials were carried out on newsprint mixtures containing about 27 per cent of sulphite with the machine running about 575 feet per minute.

Summary of Results.

The results are summarized in the tables and the more important conclusions are discussed below.

The measured cord averaged about 90 cu. ft. of solid wood, with some variations from run to run. Owing to the presence of numerous blocks noticeably under 24 inches in length and considering the rather rough method of estimating cordage in quarter-cord racks, it was considered that the measured cord was lightly smaller than the true cord of 128 cu. ft. Assuming that the normal or "standard" cord of rossed pulpwood is equivalent to 95 cu. ft. of solid wood, the wood and pulp figures calculated to this uniform basis have been added in the tables for comparison with the figures based on cords as measured. In fact, the cord is such a variable and uncertain measure that care has to be taken in interpreting the results of wood tests.

The most significant variations in the wood measurements were the differences in the weights of actual wood per cord and per cubic foot of solid wood. The oven-dry (moisture-free) weight of infected wood per cu. ft. (20.8) was only slightly less than that of sound balsam fir (21.0 lb.) showing that decay had not caused much loss of wood substance. The infected wood weighed about 12 per cent less than average wood (23.6 lbs.). Sound balsam fir was 21 per cent lighter than sound spruce (26.6 lb.), while average wood was about midway between the two.

The yields of groundwood pulp were almost directly in proportion to the weights of actual wood. The air-dry pulp per measured cord was least from infected wood at 1934 lbs. and highest from sound wood at 2195 from average wood, 93.9 per cent from infected wood was about 90 per cent of the yield from average wood, so that the apparent "shrinkage" was 10 per cent. On the other hand the yields of oven-dry pulp based on oven-dry wood were all about the same, 91.1 per cent from average wood, 93.9 per cent from infected wood and 92.3 per cent from sound wood. Although some of the measurements were subject to slight inaccuracies, it may be said in general that the total quantities of pulp varied in direct proportion to the dry weights of wood, with yields of about 92 per cent on the oven-dry weight basis. The infected wood therefore yielded better than was expected.

The grinding conditions were normal and fairly uniform throughout the runs. The time of grinding was a striking factor, the infected wood being ground in 2¼ hours while the sound spruce required 3½ hours.

Quality of pulp was a secondary consideration in the tests but some of the observations were of interest. The pulp from infected wood was decidedly brown in colour, while the spruce pulp was certainly the best in general appearance. Miscroscopic examination showed the infected pulp to be a mixture of coarse fibres with a large amount of fine wood flour, whereas the other pulps were less extreme in variation of fibre sizes. The freeness tests showed little difference in drainage properties between infected and average pulps, but the balsam fir fibres were considerably freer than the rest.

The newsprint paper runs gave practical tests of quality in relation to action of the groundwood pulps on the paper machine. A beater was furnished with spruce groundwood and about 27 per cent of regular sulphite; on the paper machine the stock ran well with no breaks and the paper produced was of good color. Under the same conditions the balsam fir groundwood mixture caused a number of breaks and the stock was rather "soft", although the paper tested almost as well. Infected pulp was mixed with an equal quantity of average groundwood in the beater along with the usual proportion of sulphite. On the paper machine the stock was slow and sticky, and there was considerable difficulty in taking the wet sheet off the couch roll to the presses. There were many breaks and very little finished paper was produced. The paper made tested surprisingly well, but was decidedly brown in color. The quality of infected groundwood is therefore much inferior for papermaking. If rotten wood has to be ground, it appears that the pulp should be mixed in small amounts with the regular supply of groundwood.

As a guide to the storage qualities of the different pulps, some twenty laps from each run were placed in a damp kiln where the conditions were favorable to the growth of fungi and moulds. After six months the laps of infected groundwood were much worse and some were so weak that they fell to pieces on handling. By contact the infected pulp had carried the fungus action into some of the average laps adjoining, and in these cases red rot had seriously affected the regular groundwood. The sound balsam fir and spruce pulps were still in good condition. The results were sufficient to point out the danger of infected groundwood spreading decay through a pile of pulp in storage.

In conclusion the writer wishes to acknowledge the co-operation of Mr. W. Finnegan, Groundwood Superintendent, and all others who assisted in the grinding tests.

CANADIAN MONEY O.K.

A judgment of interest to Canadian business men whose dealings involve the somewhat tangled question of "gold coin" payments has been rendered in connection with a dispute between the Somerville Paper Box Company, London, Ontario, and the American Chicle Company.

By the decision the Canadian concern is successful in an action brought by the American Chicle Company for payment in gold or United States funds of $50,000 due on a mortgage made ten years ago. This mortgage agreement called for payment in "lawful money of Canada or gold" if demanded.

Because of exchange conditions, the United States firm demanded gold in repayment. Orders-in-council in Canada, however, prohibited the export of gold from Canada and authorized banks to meet demands for gold with paper only. The London concern thereupon tendered full payment in Canadian money which the American Chicle Company refused to accept.

The court denided that the Canadian Company was within its rights and the judgment sets forth that payment in Canadian funds satisfies the debt.

A Student Apprentice in a Paper Mill

By A. B. COPPING, Winner of the Essay Contest of the Technical Section.

(Continued from Page 659)

The outline of stock routing, and control, has been made on the supposition that we can produce uniform stock in the grinder room and here we run against what appears to be, and in truth is, a formidable problem. To begin with, there is always present the animosity of some old timers towards anything that savours of theory or which may add to their duties. Then there are the mechanical difficulties to be encountered and such uncontrollable features as the qualities of stones and wood.

Let us view for a moment the situation. We have a certain type of grinder in good state of repair. Assuming that the wood we get is of good quality, what variable factors can make for good stock? The principal ones are, temperature of grinding, pressure, and condition of the stone.

Lengthy investigations were carried out on the effects on the stock of various temperatures and pressures and it was found that no appreciable difference was made by altering either of these conditions from the average practice of the mill, though automatic recorders for both these factors were deemed highly advisable. The conditioning of the stones was then looked into, and here was found the greatest source of variation. All stones differ in texture and should be treated accordingly. Here becomes apparent the absolute necessity of some form of supervision of the quality of the output, or in other words, the examination of the stock made by each stone in the mill at intervals or at least one hour throughout the twenty-four which comprise each day.

The Blue Grass test already described is one which, with a certain amount of practice on the part of the operator, fills the need and thus at all times the man in charge of the grinding operations knows to quite an accurate degree the condition of the stone by the type of fibre it is producing, and if he sharpens the stones according to the dictates of this test a better and more uniform stock will be produced.

The usual practice of some foremen in sharpening is to do so by instinct—and though any of them will tell you that it is not good to let a stone run more than about eight hours without some attention, several cases of long runs were noted; one being of a stone running as long as forty-two hours without being touched. Such an occurrence would not be possible if a sharpening record were kept and a copy left by each foreman for his successor.

A Definition of Paper-making.

The idea of paper-making in a nutshell is that fibres are put into water and then some of the water is removed through a wire screen, the fibres forming a mat on the wire, the remaining water being removed by pressure and evaporation.

Dyes.

Groundwood in its natural state has a yellowish color—papermakers call it a natural color—and in order to destroy that yellowish tinge and give to the paper at times a pure white, again a blue-white, aniline blue dyes (generally a mixture of Prussian blue and Methyl Violet) are added. The small quantity added has no effect, however, on the formation of a sheet.

Alum.

Again, Alum is added — about .5 per cent by weight. The purpose is primarily to harden the pitches which are especially prevalent when groundwood has been heated too much during the grinding process and which is always present when balsam and jack pine are introduced. (Also to set, or fix, the color, — Editor.)

If pitch is present and alum is not used, the wire becomes clogged by a resinous deposit and there is also this same resinous deposit on the jacket and press felts, and all the suction boxes become filled up with the pitchy mass. Modern practice has taught the paper-maker to remove this objectionable deposit by an extraordinary liberal use of kerosene which extracts the resins.

Alum also tends to give the individual tracheids a somewhat brittle character which indeed helps in the formation of a sheet. It prevents to a degree what the papermaker calls a soft stock, which is difficult to remove from the presses and consequently causes low production.

Foaming.

If too much alum is used there is a tendency for the stock to foam at the flow box and even at times on the wire. Foam also is caused by an abundance of hard pulp mixed with ordinary slush stock, viz:— groundwood pulp that has been subjected to the sun's rays becomes burnt and is hard to beat up. Even though the Jordan is set hard these particles cannot all be removed, and beating against one another cause the foam.

Free and Slow Stock.

Because of the variations in the conditions of the stock, we have the following considerations — in the summertime a papermaker will say that the stock is free because it sheds its water too quickly, i. e., before coming to the suction boxes. The expert papermaker wants water left in the sheet at the suction boxes. In this way he forms his sheet. He will tell you that, due to the temperature difference the stock is slow in the winter time, i. e., it is loath to shed its water, and at times all the water cannot be removed at the suction boxes and the sheet is too soft to be taken off the presses, due to the amount of water present.

In the summer time, in order to bring the water to the suction boxes, the machine tender will advance his apron beyond the slice and lower his slice and build up a high speed behind it. Thus the water shoots out at a much faster rate than before, all the water is not taken out at the table rolls and the water is thus carried to the suction boxes. In the winter time the apron is moved back of the slice, the Fourdrinier is lowered a little, the slice is raised and a lower head is carried back of the slice. Thus the table rolls tend to remove a greater quantity of water because the stock comes on to the wire at a slower rate and a greater depth of film. Another measure employed by the machine tender is to stick

a steam pipe in the wire pit to free up the stock. However, no attempt is made at temperaure control.

White Water.

An influencing factor on the freeness and slowness of stock as demonstrated by Fishburn is White Water.

In this matter some work was done during the summer using the Fishburn Tester. A sample each of White Water, Sulphite, Stuff Chest (Box) Slush and Groundwood were obtained and the Sedimentation Time noted as various percentage mixtures of Sulphite and Groundwood, Stuff Chest Slush and White Water were used. The results obtained are tabulated, and an example given on the curves in Fig. 4.

A few years ago most mills had an utter disregard for the re-use of white water and consequently the fibre wastes were enormous. Now, most mills have a haphazard method of white water control but the losses are still enormous.

Shrinkage.

The average papermaker pays very little attention to sewer losses — his one aim is production, and he is inclined to disregard the few old tons of good paper-making material that daily is going out to the river. Weirs are in place at all the outlets of the sewers in the Brompton News Mills and a daily report is made to the Superintendent of the tonnage lost in this way. In addition to this, the individual losses at all the points feeding the main sewers were investigated by placing weirs of a type suitable to the separate cases in the various lines of flow. Thus the total loss per day was analyzed and causes of excessive loss could be readily traced by measuring the flow at these points and comparing the results with those obtained when conditions were normal. The data collected in this manner was found very useful on many occasions when problems dealing with the available white water were dealt with.

Learning the System.

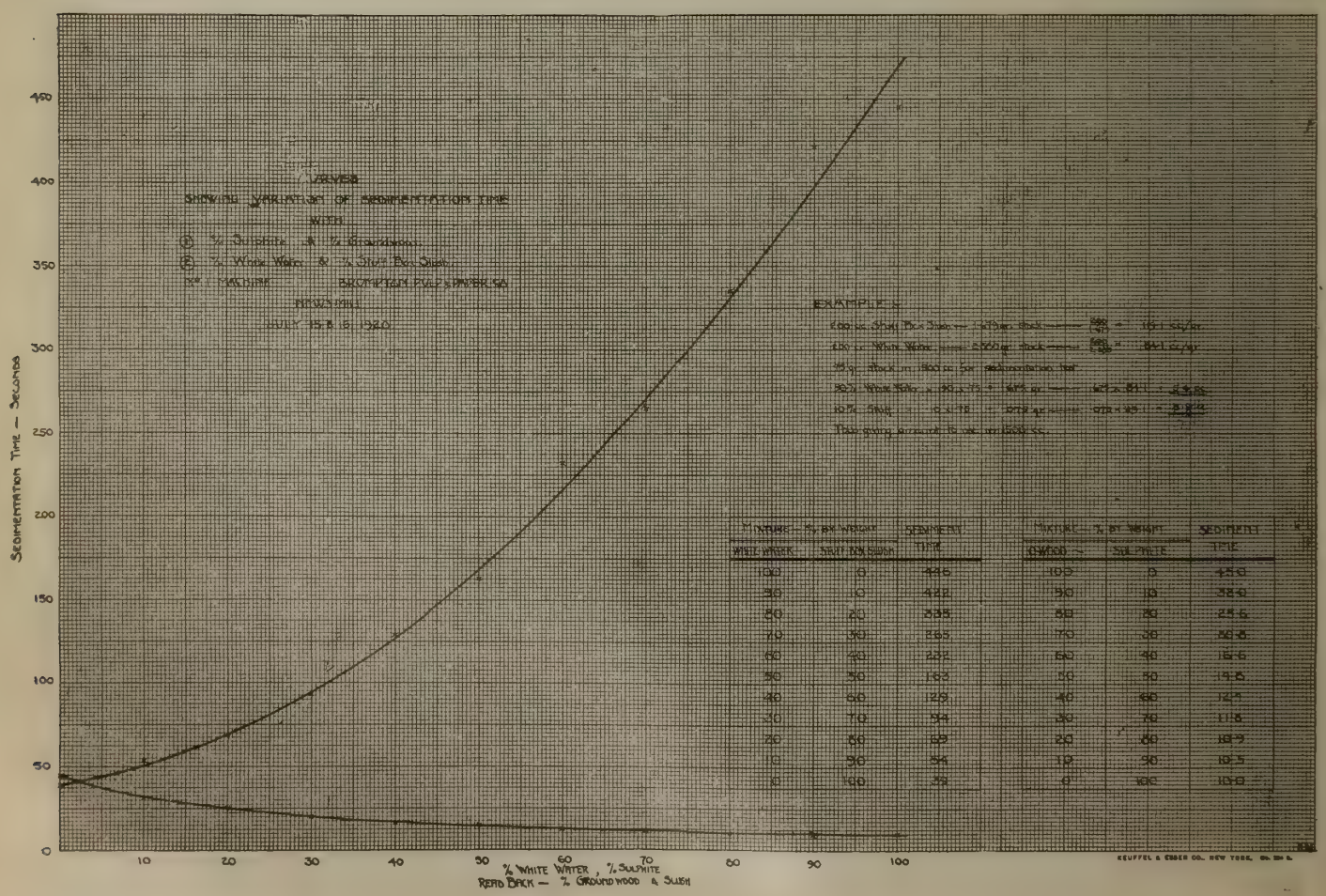
It was realized that, in order to make an intelligent investigation in a mill, those investigating should become thoroughly familiar with the existing conditions and, in our case, with the machine, particularly as regards the flow of the stock. To this end, nearly a month was spent around, over and under the machines. The whole process was watched, and during this time, sketches showing the locations of the more important piping systems were made and colored. These were not done to scale — their purpose being merely to aid in memorizing the system. Three of these are appended to the manuscript (not reproduced here): (1) Stock Routing # 1 Machine. (2) Stock Routing # 2 Machine. (3) White Water System.

As many factors as possible, affecting the running of the machines, were looked into — no definite order being observed, as it was found necessary to co-operate with the work of the groundwood crew.

The following tests, widely varied in character, but all bearing on the mill operation, are quoted as examples of the work done in the news mills.

Efficiency of Save-All.

A Brompton Company type Save-All was found to be working in an unsatisfactory manner and a test of its efficiency was made with the following results: —



24-8-20.

Waste running to Sewer 58.9 cu. ft./Min.
$= 58.9 \times 62.5$
$= 3{,}680\#/\text{Min.}$

Consistency of Waste $= 0.2485\%$ (bone-dry)

Amount Fibre lost $= 3680 \times \frac{.2485}{100}$
$= 9.125\#/\text{Min.}$

Savings $= .695$ cu. ft./Min.
$= .695 \times 62.5$
$= 43.4\#/\text{Min.}$

Consistency of Savings $= 3.53\%$ (bone-dry)

Amount Fibre saved $= 43.4 = \frac{3.53}{100}$
$= 1.53\#/\text{Min.}$

$\therefore$ Total Fibre entering Save-All $= 9.125 + 1.53$
$= 10.655\#/\text{Min.}$

Efficiency $= \frac{1.53}{10.655} = 14.35\%$

Recommendations were made which corrected the faulty action of the machine.

(To be concluded.)

BUSINESS SITUATION IN THE U.S.

Business, at the beginning of 1921, faced three primary obstacles to the conduct of affairs on anything like a normal plane. Commodity prices were still in many cases grossly inflated. Wages were still on a war basis. The banking position was obviously strained. These obstacles are not to be regarded as entirely overcome, but much progress has been made.

Six months ago it scarcely seemed possible that by this time prices for many raw materials would have reached a point of approximate stabilization; that wage reductions would have been accepted by workers in widely diversified industries in the realization that they were just and necessary, and finally that the banking position as a whole could have improved to the extent indicated by the substantial reduction in the borrowings of reporting member banks at the Federal reserve banks. Such borrowings have declined nearly 40 per cent. from the maximum reached last fall.

Sentiment with respect to business will naturally fluctuate in times like these. The reaction from the spurt in spring business has caused disappointment. The end of the premature revival in the automobile industry and the renewed downward movement in the prices of some commodities, notably sugar and petroleum, have been factors in bringing about a spirit of pessimism which is not entirely justified when the improvement in fundamental conditions is considered.

On the other hand, it is unwise to expect other than quiet business during the summer months. Satisfactory recovery can come only after a protracted period, during which price liquidation must be completed as to manufactured and semi-finished goods and confidence in the future restored. Closely connected, too, with domestic business is the state of trade abroad and especially in Europe where political considerations must be a powerful influence in shaping the future. But in this direction also encouragement may be found in the fixing of a definite schedule of reparations payments as well as the now plainly discernible determination of most of the peoples of Europe to resume productive enterprise as rapidly as possible.—Bulletin National Bank of Commerce in New York.

GARDEN CITY PAPER MILLS COMPANY, LTD.

By A. R. R. JONES.

Pretty nearly ideal locations are those of the two plants of the Garden City Paper Mills Company, Ltd., situated at St. Catharines, Ont. and Merritton, Ont., respectively. They possess the great advantages of abundance of power, contiguity to large consuming and manufacturing centres and a favorable situation generally in respect of efficiency combined with economy in paper manufacturing.

At its No. 1 plant at St. Catharine's the Company manufactures extensive lines of various grades of paper. These include toilet paper, tissue, fruit wraps, manifold waxing papers, strong lightweight wrappings, lightweight carbonizing papers and various other lightweight specialties. A highly popular line turned out from this plant is that of folded towels. This folded towel is known as "The Northern" and it is used extensively not only in lavatories, bath-rooms, etc., but also very widely in garages, both public and private.

This No. 1 plant is situated on Lock Seven, Old Welland Canal, at which point the Company owns a first-rate water power. The machinery installed, which includes an 84 inch Harper Fourdrinier, is all of the most modern and efficient kind. This, together with the admirable arrangement of the mill, has resulted in making the plant a model of which a modern tissue and toilet paper mill ought to be.

The No. 2 plant, which is at Merritton, is the "Converting Plant," and here is produced a range of lightweight wax papers—a department which is in process of development on a largely increased scale.

The capacity of the two plants is for 3,500 tons per year. Both plants are working full all the time—a highly gratifying state of affairs, at the present time, and one which is, no doubt, largely attributable to the satisfaction given by the Company's products. The shipping facilities are excellent. Under the progressive management which characterizes the Company's operations, and which makes it a prime factor of policy to maintain unimpaired the highest standard of quality in its output, the Company's products enjoy a high reputation not only in Canada but in many other countries as well.

Mr. Lauren H. Gardner is president and general manager of the Company; Mr. R. E. Myers, vice-president; Mr. Charles V. Syrett, secretary-treasurer; and the other directors are Messrs. H. J. Severance and Leo. E. Charles.

PULP AND PAPER IN SWEDEN.

In the wood pulp market there is no noticeable change. A number of Swedish pulp mills have now decided to follow the example of their Norwegian colleagues, to suspend production or to restrict it to a fraction of the former output in anticipation of a rising market in the course of the summer, when these measures will have had time to make their effects felt.

As far as paper is concerned, there is still a lively demand, especially for news, with the result that stocks are about to be emptied; but owing to the large supply so far, prices remain low. This fact in conjunction with the strike is checking the operations of the Norwegian mill owners, who are taking up an attitude of extreme caution, as they are disinclined to commit themselves to operations on a somewhat larger scale. —C. E. SONTUM, in T. & C. Weekly Bulletin.

ASSOCIATION FOOTBALL AT THREE RIVERS.

A splendid contested game was that which took place at Three Rivers between the Wayagamack Pulp and Paper Co. Football Club and the Tidewater Shipyard Club, Wayagamack running out winners by 5-0. Ewen kicked off for Wayagamack before a large and enthusiastic crowd. Wayagamack scoring through Thompson after 5 minutes of play. Tidewater took up running after but met a rock-like defence in Hamilton and Ormrod, Wayagamack came back again and Carlin handling the ball in the penalty area Cameron scored from the penalty kick the second goal for Wayagamack. Tidewater made desperate attempts to reduce the lead but without success, half-time arriving with the score 2-0 in favor of Wayagamack.

The second half opened up with Wayagamack having advantage of the wind and soon made tracks for the Tidewater goal and it was easily seen that the Wayagamack forwards would make trouble for the Tidewater defence. Cameron playing a star game at out-side left, Hunter, Stewart and Ewen scored this half and Wayagamack run out easy winners by 5 to 0.

For the winners the whole team played well and executed some pretty passing movements, Tidewater apparently tired the second half but their defence never gave up.

A pleasing feature was the large crowd that turned out to see the game, this is the first year of the League since the war, and shows the game is still very popular.

Baseball in the St. Maurice Valley moves apace. On the 19th the Grand'Mere team beat the International Mill by a score of 18 to 1 and put Grand'Mere on a par with the Three Rivers team for first place in the league.

Mr. William Whyte is on his way to Japan in the interests of Ayers Limited and Niagara Wire Weaving Company.

Mr. Charles R. Van de Carr, Jr., superintendent of the Laurentide paper mill, who has been in poor health for some time, was operated on for appendicitis at the Royal Victoria Hospital, Montreal, and at the present time is improving rapidly.



Chief Emile Berthiaume, Police and Fire Dept's., Three Rivers.

QUEBEC MAKES MOST OF CANADA'S GROUNDWOOD.

In the year 1920, a total of 827,982 cords of pulpwood were produced in Quebec, having a value of $10,163,515. In the finished manufacture, Quebec consumed 1,085,278 cords of the raw material, leading all the other provinces by a wide margin. An average of 2,078 pounds of pulp per cord was secured throughout the year, the average maintained in the sulphite process was 1,042 pounds per cord, and in the sulphate process, 1,145 pounds. The actual output of groundwood pulp was 493,520 tons, or 79·50 per cent of the Dominion capacity. The province of Quebec produces more than forty per cent of the Dominion's finished pulp.

The extensive supplies of raw material, the province's wealth of water powers in proximity to the forests, the excellent transportation facilities of all kinds with adequate shipping facilities, have all contributed to make the pulp and paper industry so important in Quebec, whilst the provincial embargo on the export of pulpwood cut on Crown lands in a raw, unmanufactured state has compelled manufacture in the province with the establishment of mills, and so built up a purely Canadian industry of prime importance. Activity is not confined to one or more localities, but its sphere is as broad as Quebec's woods are extensive, touching into every corner of the province.

The rapid expansion of the industry in Quebec can be judged from the extensions which the year 1920 witnessed. At Chandler, the Saguenay Company increased their output from 80 to 130 tons per day. At Grand Mere, the Laurentide Company installed two new newsprint machines, giving a total daily capacity of about 350 tons of newsprint and 60 tons of boards. At Quebec, the Hammermill Paper Company established itself. At Clarke City, the Imperial Paper Mills and the Amalgamated Press took over a plant and enlarged its output. The Howard Smith Company brought their output up to 100 tons per day. Price Brothers, by adding a new machine, increased their newsprint output to 300 tons a day. Construction of the International Company will increase output to 200 tons of pulp and the same amount of paper. The Brompton Company has nearly completed a new groundwood mill of 100 tons daily capacity and, in addition, has secured new tracts containing 1,000,000 cords of pulpwood. The Belgo-Canadian made important additions to their plant, and increased output. The Wayagamack Company brought their production up to 115 tons of kraft per day, and added 2,000 square miles to their timber limits.

Outlook for 1921.

What 1921 will bring to the industry is foreshadowed in anticipated developments. The Three Rivers Pulp and Paper Company, incorporated last year with a capital of $4,000,000,will commence activities this year. The International Paper Company's plant at Three Rivers is nearing completion, and will have a daily capacity of 200 tons of pulp and 200 tons of paper. Price Brothers, Limited, also have a new development at Saguenay, Quebec.

The province of Quebec, both through its Government and the large corporations operating plants in the province, is following a sane policy of forestation, having wisely profited by the experience of older countries. Quebec is treating her forests not as mines of inexhaustible resources, but as crops to be resown after harvest.—C.P.R. Bulletin.

British Trade News

(From OUR LONDON CORRESPONDENT.)

London, June 11, 1921.

This is the centenary year of Bertrams, Ltd., Sciennes Engineering Works, Edinburgh, the well-known papermakers' engineers, and the historical event is being celebrated in true Scottish style. The other day the workers enjoyed a pleasant trip through Highland scenery and Mr. Milne, the managing Director, told them that, in addition to defraying the expenses of the outing, the Firm had decided, in honor of the occasion, to pay the employees a day's wage. Needless to say, the news was received with much joy and the chairman of the workers' committee returned thanks, pointing out that such an action showed the good relations that existed between employers and employees in the works, particularly at a time like the present when the country was afflicted with so much regrettable unrest.

The Fight to Protect Paper.

The fight to get paper included in the Safeguarding of Industries Bill, now before the House of Commons, is still going on and the Bill is, step by step, gradually becoming law—the measure not yet receiving any setback from opposition sources. To refresh Canadian memories I must state that there are two camps in existence at present, viz. those who do not want paper included in the Bill and those who do. In other words the consumers are on one side and the producers on the other, the latter contending that they simply want to be protected against countries with debased rates of exchange such as Finland, Germany, and one or two other foreign producing centres, who were underselling the British product. Newsprint was one of the chief topics. The consumers, who include some of the newspaper owners, say if newsprint and other papers are included their cost of production will go up considerably and they want open competition to keep the British price down to a reasonable level. Today British newsprint is 5½ cents a lb. for contracts and foreign 5 cents, so we are gradually getting down near pre-war rates. The papermakers contend they are not afraid of open competition, but they cannot compete against countries whose finances are in a state of chaos. Here is part of their case why they should come under the Bill, which advocates 33 1/3 per cent duty on articles imported and produced below the cost of a British article:—

Delivery Period: Foreign mills—three to 10 weeks, subject to "force majeure" and other uncertainties, restrictions and obstacles. British mills—Definite delivery date, usually within a week from date of order.

Convenience: Foreign mills—Large stocks of all sizes used have to be carried to guard against shortage due to uncertain delivery period. This involves heavy rent, interest and insurance on inactive sizes. British Mills—No dead stock, sizes actually required are delivered as and when required.

Economy: Foreign Mills—Interest on advance payments; Rent and Insurance on stocks carried; Extra haulage to and from store; Damage in transit from frequent handlings and injury to edges of sheets and reels cause great losses of time on presses. Time is money; overtime is double money. British Mills—Actual saving £2 to £3 15s. per ton; Deliver in good condition and you pay 5 or 6 weeks after you have the paper ready for use.

That is the case put forward today by the British papermakers.

The Newsprint Consumers Case.

The consumers say it is quite clear that paper can be included in the Bill if the articles are sold (a) at prices below the cost of production or (b) at prices which by reason of depreciation in value in relation to sterling of the currency of the country in which the goods are manufactured, are below the prices at which similar goods can be profitably manufactured in the United Kingdom. This is one point admitted in favor of the papermakers. The consumers then ask: "Who is to decide where the paper has been produced, if imported, what was the cost of production, what was the state of the currency at the time of production, and the cost of similar paper 'profitably manufactured' in the United Kingdom?" To put a question like this to the intelligence of papermakers shows what little knowledge the consumers have of the paper industry existing in their own country and it is such people the producers are up against. Then they ask: "Who is to find out with any accuracy the cost of production of paper in Finland, Sweden, and Norway; would it not require separate Commissions? They forget the information is in London and that for the past 50 years British papermakers are competing with foreign made paper, scientifically and otherwise, and that what is not known in the British Mills is not worth knowing. The papermaker has not been like the consumer of newsprint—thirty years behind the times; he has gone on shrewdly with research work and studied the markets and the foreign producers and his results have not been acclaimed from the housetops. No doubt there is great activity on the part of consumers to keep the market open for fair and unfair competition; but then it must be remembered that a paper industry employing over 53,000 workers—and more than half of them idle at the moment—must be protected in some degree from debased rates of exchange and it is only this protection British producers ask. There is no other country in the world that woul stand the policy that is going on in England today and it is for Canada's benefit also that the Bill should be passed. The consumers, therefore, have not made out their case yet. They only complain that their paper will cost them more and they have not yet proved where the extra cost will come in—they have only passed resolutions up and down the country asking Parliament not to put paper in the Bill and they have utterly failed to understand and interpret the present economic and international position as a whole.

The "Newspaper World" (the mouthpiece of the newspapers) asks: "How can anybody decide judicially under (b) that Swedish paper manufactured from Swedish pulp by the aid of Swedish water power, was improperly sold in this country at a price lower than paper made in this country from similar Swedish pulp?" The paper adds that the problem is too deep for the simple mind.

It is subjects like this the British papermaker has to contend with. One would think there was no Papermakers Association (or Customs) in existence.

Coal Miners Strike May Soon End.

Since I started writing these notes a ray of sunshine has suddenly appeared in the industrial darkness overhanging the paper industry. The coal miners and mine owners have been in consultation, as a result of which a ballot is to be again taken on the questions of

resuming work at a reduced wage or remain out on strike in order to press for better terms. Conferences have been held up and down the country and it remains to be seen now how the rank and file of the miners will take things. The outlook at the moment looks hopeful. The engineering trades are now threatening to cease work, The men in the industry, however, are not so wicked in demanding what they think are their rights as the miners are and a round table conference may sooth matters for the time being.

Wages Trouble Brewing in Paper Industry.

I have come to the conclusion that a big strike is like a contageous disease—it spreads to all classes. The workers in the British paper mills are now unsettled. As I pointed out some time ago the scheme of fixing wages according to the rise and fall in the cost of living is the root of all the evil. Men who were earning £5 a week 18 months ago cannot understand why they should drop down to £4 and £3—as the cost of living falls—and consequently they will stand out for the £5 or strike for it. This is only an illustration I give, as the fall in wages is not so great as from £5 to £3. But in the case of the paper workers the employers say that during the past 12 months the cost of living has gone down, trade is bad, some mills are closed, and there must be a cut in the wages sheet. Now the workers say the reduction in their wages is too large and if they will not accept it they expect to be locked out. Negotiations are taking place and possibly some way will be seen out of the difficulty. The open door for conferences and negotiating is a great policy in industrial disputes and no doubt wise heads will be called in.

"To reduce my money, means that I cannot live and keep my wife and four children," said a paper worker to me the other day. "It is true living has gone down slightly," he added, "but it was done in this way: they reduced sugar per lb. and what my family gained on that reduction had to be paid out on vegetables. Before the war you never heard of anyone buying vegetables by the lb., except certain classes, but now everything is sold by the lb. Money speaks and I know what it costs to live now and what it did 12 months ago. I am out for no reduction in my wages." This is the spirit of obstinancy the employers are up against.

Pulp and Paper Situation.

In the paper market wholesalers, merchants, agents, as well as the manufacturers, are going through a period of exceptional dullness, and unemployment in the mills is very high. Producers are hoping that when the miners get their difficulties settled there will be a nice revival in trade. The cardboard, strawboard, and other similar lines have received a rude shock by the cotton workers strike and business is at a standstill.

There is no life in pulp market as yet. Some good shipments, on contract, are arriving from Canada. Prices are about as follows:—

Bleached Sulphite, £35; Easy Bleaching £26; Sulphite, newsprint quality, £23; Unbleached Soda £25; Soda Kraft, £22; Groundwood, moist, £7 (dry, £14) per ton.

THE FIRST PULP MILL IN ALASKA.

The Alaska Pulp and Paper Company has erected a pulp mill of two four-pocket grinders in Snettisham Arm, in the Tongass National Forest, near Juneau. Power is derived from Tease Lake, a short distance back from shore, and consists of a flume and pipe line direct to a Pelton wheel on the same shaft with the grinders. About 2,000 horsepower are secured. Construction began last May, and the first run of pulp came off the wet machine on January 24th. It is not the plan of the company to manufacture paper at this time, but merely to demonstrate the feasibility of the manufacture of pulp in Alaska. For the present, the pulp will be shipped to the states for manufacturing into paper, and later a paper mill may be erected.

The forest service has made an initial sale of 100,000,000 feet of spruce and hemlock timber to the company. This timber is in several tracts close to the mill, and will be sufficient to meet their requirements until such time as they can increase their capacity.



A general view of the plant is shown above. --Courtesy News Print Service Bureau.

Technical Section

REVIEW OF RECENT LITERATURE.

A-16; R-13. Committee on Mechanical Standards. The committee reports the results of its investigations of acid-resisting bronze, antimonial lead, and bearing metals. With regard to acid-resisting bronze all castings must be free from flaws, dross, porous spots, and the furnaces free from scale, sand or loam. An increase in lead above 5 per cent does not fulfill any useful purpose; the strength and toughness rapidly decrease while the acid resisting qualities are not materially affected. Any effect of this constituent is probably due to the fact that a high percentage of lead makes it difficult to obtain a sound casting, with the result that acid eats its way into the interior of the casting, quickly disintegrating it. The addition of tin, up to 20 per cent, gives an alloy possessing great strength and hardness. An alloy containing over 10 per cent of tin has a very complex freezing point curve; between 10 and 20 percent, there being no less than three distinct freezing points. This means that such an alloy solidifies in three separate portions, thus accelerating the tendeny to segregations with the consequent decrease in strength and ductility. The presence of phosphorus in the bronze, up to 0.1 percent, has a very marked effect on its properties, greatly increasing its strength and toughness and also notably facilitating the founding. It is recommended that in any specification for bronze the presence of not less than 0.05 percent phosphorus should be insisted on. The suggested specifications for acid resisting bronze are as follows: copper, 84.5 to 85 percent; tin 9.5 to 10.5 percent; lead, 4.5 to 5.5 per cent; phosphorus, not less than 0.05 percent; impurities, not more than 0.5 percent. A few acid resisting metals sold under trade names were also examined. "Meco" and "Aterite" contained chiefly copper, nickel, and zinc, with a small addition of lead, iron and silicon. They have a satisfactory tensile strength (about 40,000 lb.), the hardness of 25 to 30 points (Shore scale). They are both affected to some degree by moist SO_2-gas, but appear to possess notable acid-resisting qualities. Their present market price does not allow them to compete with the copper-tin-lead alloys. "Promet Branze" (a copper-zinc alloy) is very strong and tough, but owing to its high zinc content is hardly suitable for sulphite mill work.

As antimonial lead is used principally for lead piping, the composition to be used will be determined principally by the physical requirements of such piping, which are that it does not collapse under its own weight, and that it does not creep, sag or bend under exposure to the pressure and temperature of the digester gases. On the other hand, it should not be brittle. The alloy containing 10 to 11 percent of antimony best fills these conditions. Below 10 percent of antimony the tensile and compressive strengths of the alloy decrease rapidly and while more plactic it is very soft. By an addition of more than 11 percent antimony no advantage is gained, as above this percentage the alloy rapidly becomes brittle. It is furthermore extremely difficult to obtain homogeneous castings with antimony present in proportions above this percentage. Good foundry practice is necessary in order to obtain a homogeneous alloy, and it is recommended that the necessary chemical and physical tests be included in the specification for antimonial lead.

The investigation of bearing metal was confined to white metals alloys and consisting in an investigation of the physical characteristics of two babbits which seem to be extensively used by some of the pulp and paper mills, and of three metals (sold under trade names and not on an analysis basis) thought to be of considerable interest. The compositions of the metals investigated are tabulated, together with their hardness (Shore scale), tensile and compressive strengths, and also their relative cost based on the present market prices of the metals of which they are composed. The results are briefly discussed, attention being particularly drawn to "Frary metal", which consists essentially of lead containing small amounts of calcium and barium, and which showed up very well under some tests to which it was subjected by the U. S. Bureau of Standards.—Abstract of report in Pulp and Paper, Jan. 20, 1921.

A-15. Pulp Evaluation as Affected by the Fiber Ratio in the Test Sheets. C. L. BACHELDER, **Paper,** xxvii, 11 (Nov. 17, 1920). The method of determining the strength of pulp as actually carried out has a number of objectionable features, such as a personal equation, a machine direction to the fibers, and an uneven sheet. An even sheet is defined as "one having for every fiber running in one direction an equal number of fibers running at right angles to the first." Such a sheet may be called a 100 per cent sheet and should test the same in all directions. But in the preparation of hand sheets, this is not obtained, and fiber direction is not eliminated. In the method generally used the pulp to be tested is beaten in an experimental beater or ball mill and then made into hand sheets. The sheets are then tested for strength, usually by the "pop" test. In this method it is important that the pulp be always prepared in a uniform manner. The consistence of the stock and the number of passes of the mould in the vat depend on the required thickness of the sheet. The manipulation of the mould in the vat has some influence on the formation of the sheet, but in most cases the formation is not as good as on the machine. A manipulation which gives excellent results is as follows: the mould was sunk to the bottom of the vat, and after the stock had been stirred thoroughly but carefully in order to eliminate any currents which might affect the formation of the sheets, and after time had been allowed for the violent agitation to cease, the mould was raised vertically. It is recommended to make hand sheets on a suction mould. It requires no great skill or training to operate the apparatus, and a number of samples can be turned out in a short time. The inaccuracies arising from personal equation, machine direction, and uneven sheets are reduced to a minimum; the only apparent cause of error is in stirring the stock and causing it to circulate in currents. The experiments described led to the following conclusions: (1) The fiber direction is the controlling factor in strength tests. (2) Before a sheet can be called uniform the fibers must be uniformly

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UNITED STATES NOTES

Figures announced by the Federal Trade Commission show that production of newsprint was considerably less in May than in the corresponding month a year ago. The total output for the month is given at 78,868 net tons, compared with 129,230 tons a year ago. Shipments during the month amounted to 82,776 tons, against 128,080 tons in May, 1920. Stocks on hand at the end of the month were 31,198 tons, an increase as compared with 22,823 tons a year ago. Standard news production is reported as 73,181 tons, against 118,906 tons, shipments at 75,806 tons, against 118,832 tons, and stocks on hand at 26,956 tons, compared with 20,-159 tons in the same month of the previous year.

Oscar Gumbinsky, of Oscar Gumbinsky & Bros., the big Western paper stock concern, succeeds the late Frank H. Millman as president of the Eddy Paper Company, Three Rivers and White Pigeon, Mich. Mr. Gumbinsky has been associated with the manegement of the Eddy Paper Company since its founding on a smal scale in 1906, and his shrewd handling of part of its affairs contributed no little toward the growth of its business so that the concern is now one of the largest paper manufacturing establishments in Michigan. Mr. Gumbinsky is regarded as one of the keenest paper mill executives in America, and he has a natural aptitude for financial and organization work. Another change in the Eddy Company management affects the position of general manager which has been tendered to A. B. Thomas, former general manager of the MacSimBar Paper Company, Otsego. Mr. Thomas takes the place of Charles E. Nelson, who resigned recently. Mr. Nelson, it is understood, will enter the sales department, taking charge of sales and distribution in the Chicago territory. Alfred Plummer, widely known in the Middle West's boxboard field, has been appointed general sales manager.

Joseph C. Sibley, of Franklin, Pa., a former resident of Florida, has written an interesting letter to the press in which he seeks to have the attention of the American publishers and of the Government authorities directed to the possibilities for producing pulp for paper making from the scrub palmetto. Mr. Sibley believes that once this problem is practically solved, Florida can supply the paper needs of all America from her abundant growth of the palmetto. Another correspondent, E. J. Whitehead, of Westfield, N.J., in endorsing Mr. Sibley's suggestion, points out that the palmetto reproduces so rapidly that the fields it covers can be cut over year in and year out.

A preliminary statement of the Forest Service of the United States, co-operating with the Bureau of the Census and New York State in a census of timber cut for wood-using industries, shows that New York State cut 411.000,000 feet in 1920 valued at $20,000,000, or nearly double the value of the 1918 cut. Hemlock retains first place in quantity, closely followed by maple. Both hemlock and spruce lumber were less in quantity than in 1919, the decrease in spruce being probably due to the demands of the pulp mills for this species.

Negotiations aiming at a settlement of the strike in the score or more of large paper mills which have been tied up since May 1, and in some cases since May 11, are again being carried on between representatives of the paper workers and the manufacturers. Both sides incline to the view that terms for ending the strike will be agreed upon within a very short time. It is believed that the International Paper Company is prepared to effect a compromise on the matter of wages. The management is demanding a cut of 30 per cent, while the workers are insisting on a raise of 10 per cent. The result of the conference now going on may be a reduction of 20 per cent. Several other companies have already terminated strikes in their plants on this basis. According to a recent statement by the company their wage cost per ton of paper is $22.88, with the wage scale now in force. On this basis a thirty per cent reduction would mean a saving of $6.86 a ton; 20 per cent reduction would mean a saving of $4.58 a ton. The company recently cut its newsprint price $15 a ton for contracts on the quarter commencing July 1, or from $110 to $95 a ton.

Washington B. Venderlip, who has been in Siberia for the Russia Development Syndicate, arrived in New York last week, announcing among other things that he has a concession to 10,000,000 acres of spruce timber land on the Murmansk coast, which, if properly worked, will reduce the price of newsprint paper from 50 to 75 per cent. He described the tract as a submerged forest. One reason why it would so greatly reduce print paper costs, he said, is that pulp made from it on the ground will provide cargoes for vessels returning to the United States from nearby ports. It will be necessary for the United States to enter into a trade agreement with Russia before the concession can be fully utilized. (Working submerged timber sounds "fishy" to us.—Ed.)

Addressing the annual convention of the Southern Newspaper Publisher's Association last week, E. W. Barrett, editor of the Birmingham (Ala.) Age-Herald, said that the mountains and foothills of the South have an inexhaustible supply of spruce pine, from which satisfactory newsprint can be manufactured much cheaper than from Northern wood. He exhibited copies of his publication printed on paper made from spruce pine cut on Yellow Creek, near Warrior River, Ala. Experts are said to have declared this paper—made from wood shipped to Northern mills—the equal in every respect of the newsprint made from Canadian spruce.

A particularly interesting bit of assistance to owners of pulp wood land was given by the American Paper and Pulp Association when O. M. Porter, Assistant Secretary of the Association, was loaned as a technical forester to make a rough preliminary reconnaissance of some valuable timber lands in northwestern Maine. His brief survey showed that the land contained considerably more value in standing timber than had been supposed, and he advised in reporting on the conditions, that a forester be engaged to handle the property, after making a complete and accurate survey of the entire tract.

PULP AND PAPER NEWS

The strike of Toronto printers, pressmen and bookbinders is now broken, so far as the bookbinders are concerned. Large numbers of the latter have applied for their old jobs, but, while many have been taken on again by the firms with which they were employed prior to the occurrence of the strike, quite a considerable number have found that their old jobs are filled, and so they go to swell the ranks of the workless. The officials of the striking printing unions declare that the defection of the bookbinders will not have any serious effect upon their membership. But it is obvious that it can scarcely contribute to the strike's prospects of success.

Reference has been made, before now, in these columns to the very general resentment at the Toronto strikers' demands displayed by business and commercial men in the city who are either unconnected or else very remotely connected with the printing industry. In such quarters, the men's demands are generally regarded as preposterous. It is, perhaps, the demand for increased wages which comes in for most denunciation on the ground that it has been made at a moment when economic conditions require that production costs be lowered. At the same time, if there are any Toronto manufacturers, or chief executives of manufacturing concerns, who regard the idea of a forty-four hour working week with favor, the present writer, who has discussed the matter with scores of them, has not come across any. In a general way, the line taken is that a forty-four hour working week is not much more than sufficient to keep a man in health. Even those who reluctantly concede that, in some industries, the work may be of so arduous a nature that forty-four hours at it in any one week are possibly as much as a man can put in with full benefit to his employer and with full credit to himself, are among the foremost to deny that by any stretch of imagination, the work of a printer can be numbered among those arduous industries. They say that it "does not take it out of a man" to the same extent as many other callings where a forty-four hour working week is not in vogue. Thus, from commercial and business circles generally, the employing printers are being admonished to stand firm in their resistance to the men's demands. That, by the way, is just what they look like doing.

Highly successful was the annual convention of the Canadian Paper Box Manufacturers' Association which was held, last week, in the Royal Connaught Hotel, Hamilton, Ont. The atmosphere of optimism respecting future conditions pervaded the whole of the proceedings. In the course of an excellent paper, Mr. Walter Trum, president of the Metropolitan Paper Box Manufacturers' Association, of New York, predicted that the worst of the slump was over and that all that was now needed to ensure a satisfactory trade revival was aggressive salesmanship and loyalty on the part of the manufacturers to their customers. The same spirit of optimism inspired the various papers read by delegates relating chiefly to the trade. Mr. Charles T. Reid presided, and Controller Calvin Davis welcomed the convention on behalf of the city of Hamilton.

Speaking of this convention, special mention should be made of the talk given, by request, by Mr. A. L. Dawe, secretary of the Canadian Pulp and Paper Association. The talk centred mainly around the possibilities of extending the use of packages and boxes throughout Canada. This is a subject to which Mr. Dawe has devoted considerable thought and attention. It is to be hoped that his talk which was very interesting and instructive, and was highly appreciated will be fruitful of results in the requisite direction.

Representatives of the Boston banking firms interested in the financing of the Riordon Company,Ltd., arrived in Montreal last week and stayed in the city over the week-end. The firms with representatives among the visitors were Harris, Forbes and Co., E. H. Rollins and Sons and Parkinson and Burr. The visitors conferred with the management of the Riordon Company.

Information regarding the recent operation of two of the principal paper companies is of a highly favorable character. The Laurentide Company had a record output in May, while sales of the Brompton Pulp and Paper Company have increased each succeeding month, from $540,000 in January to $1,050,000 in May.

The Toronto Women's Press Club will issue in the late Autumn a small book of verse. All the contributors to the book will be members of the Club.

In the cup competition, Shawinigan beat Laurentide by 1 to 0 in a hard fought football game on the 18th. This gives Shawinigan the right to play Wayagamack in the final to be played on July 9th.

The new transformers at East Angus will be ready to be cut over on July 1st. They will receive current at high voltage from Shawinigan Falls and step it down to a working pressure of 2,200 volts. This installation was required in connection with the new groundwood mill. The new boiler house for the Brompton sulphate mill is now in full operation and running smoothly. All the machinery for the new groundwood mill is in place and it is expected that operations will commence about the middle of July.

Mr. George Chahoon, Jr. was prevented from attending the dinner at Laurentide Inn in honor of the visit of the Technical Section as he was on his way back from Quebec where he met Mrs. Chahoon and daughters Miss Mary Elizabeth, and Miss Margaret on their return from England and the Continent.

Mr. William McE. Bowden, head of the Laurentide Logging Division, who was badly shaken up in the recent hydroplane "crash," is now able to walk some distance without great effort and is able to go out of doors for short periods. His progress, while somewhat slow, is steady. Captain W. R. Maxwell, the injured pilot, is back at his duties at the air station.

The company 'planes have been doing photographic work since the forest fires in this vicinity have been extinguished. Previously the thick smoke pall obscured most of the country and made photographic work impossible.

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distributed. (3) Such a condition cannot be obtained when the hand mould is manipulated as under the present method. (4) The suction mould does eliminate many of the undesirable factors, and the result is a sheet more nearly perfect than can be made by any of the other methods described. Fiber direction in the sheet was studied in the following manner. To 23lb. of furnish of 50 per cent bleached aspen soda and 50 per cent spruce sulphite was added 0.165lb. of the same furnish which had been colored blue. After this was well mixed in the beater, it was dumped into the stock chest; part was then run over the machine in a regular machine run, and part was drawn off from the chest to be made up later into hands sheets. A granite sheet was obtained, the blue fibers of which were easily distinguished with the aid of an eyeglass.—A. P.-C.

A-0. Polysaccharides. I. The methylation of starch. P. KARRER. **Helvetic Chimica Acta.** III, 5 (1920); **Paper,** xxvii, 11 (Nov. 17, 1920). Theory of the constitution of the polysaccharides such as dextrin, starch, and cellulose. The starch grain and the cellulose fiber are considered as being "crystalloids" in which certain directive forces are still present and which arrange the molecules according to a definite law into crystal-like compounds. A starch crystalloid may be caused to form a colloidal solution by pulverizing, soaking, etc., but the dissolved particles always consist of many molecules. True solutions may be obtained from the starch by preparing such derivatives as are naturally soluble in water or other solvents. The solubility of this derivative is the cause of the "depolymerization" which follows solution—or better say the destruction of the crystalloid. The preparation of the methyl derivatives of starch is taken to prove the above theory.—A. P.-C.

E-2. Fusel Oil from Sulphite Alcohol. RUDOLF SIEBER. **Woch. Papierfabr.,** li, 35 (Sept. 4, 1920). Brief discussion of the composition of the fusel oil obtained by the distillation of sulphite alcohol. The yield of fusel oil is always much less from sulphite alcohol than from bewery alcohol, owing to the very small amount of nitrogenous material in the sulphite mash; but the principal constituents are always alcohol of the amyl and hexyl series. It also contains an appreciable amount of borneol, which is most probably derived from the resinous portion of the wood. —A. P.-C.

E-2. Methyl Alcohol from Lignin. EMIL HEUSER and HANZ SCHMELZ. **Cellulose Chemie.** 1, 6 (Oct. 22, 1920; **Paper,** xxvii, 11 (Nov. 17, 1920). Translation by CLARENCE J. WEST. See **Pulp and Paper,** xix, 138 (Feb. 3, 1921).—A. P.-C.

F-1. A Rapid Method of Control Analysis of Sulphate Liquor. C. K. BERGMAN, **Finsk Pappers-Och Trava-rutidskrift** (Nov. 15, 1920), **Pulp and Paper,** xix, 11-2 (Jan. 6, 1921). Sulphate liquors contain Na_2CO_3, NaOH, Na_2S, and small quantities of sulphite and silicate of soda, which can generally be neglected. An alkalimetric titration with methyl orange as indicator gives:

I. $Na_2CO_3 + NaOH + Na_2S$

while with phenolphthalein as indicator we have

II. $\frac{1}{2}Na_2CO_3 + NaOH + \frac{1}{2}Na_2S$

An iodometric titration gives

III. Na_2S.

And an alkalimetric titration with phenolphthalein as indicator, after addition of an excess of barium chloride to precipitate the carbonates, gives

IV. $NaOH + \frac{1}{2}Na_2S$

If **a, b, c, d,** are the volumes of standard solutions required for the titrations I, II, IV, and III, respectively, we have from I, II, IV:—$Na_2CO_3 = 2(b—c)$; $NaOH = 2b—a$; $Na_2S = 2(a—2b + c)$.

From I, II, and III we get:—$Na_2Co_3 = 2(a—b)—d$; $NaOH = 2b—a$; $Na_2S = d$.

From I, III, and IV, we get: $Na_2CO_3 = a — c — \frac{1}{2}d$; $NaOH = c — \frac{1}{2}d$; $Na_2S = d$.

The presence of silicate and of sulphite of soda introduces an error; but a correction can be applied by determining these separately by one of the known methods. The use of I, II, and IV has the advantage of requiring but one standard solution. Most of the mills merely determine the "causticity", i.e. 1006-a.—A. P.- C.

F-0; K-17. Book Paper from Southern Pines and Gums. SYDNEY D. WELLS, **Paper,** xxvii, 12 (Nov. 24, 1920). See **Pulp and Paper,** xviii, 1286 (Dec. 16, 1920).—A. P.-C.

K-10. Rosin and Rosin Sizing. E. SUTERMEISTER. **Paper,** xxvii, 13 (Dec. 1, 1920). A study on the sizing efficiency of different grades of rosin. From the results obtained and from observations made during the tests described in the paper, the following points are brought out: (1) It appears that the sizing value of the rosin increases in passing from the darker to the lighter grades, though the difference in favor of the lighter grades is hardly enough to justify any great difference in price. (2) The sheets as made for these tests were not calendered and in comparing them for color no difference could be detected in those sized with W.W. and with D rosin. With calendered sheets where more rosin is used this might not hold true, but it is believed that any difference in color would not be serious enough to prevent the use of the lower grades provided the dirt could be sufficiently reduced. (3) The separation of rosin which occurs when the size emulsion stands three or four days does not seem to have any harmful effect on its sizing quality, nor does the clear emulsion from the mill have a much greater sizing power than the milky and opaque emulsions from the laboratory-made size.—A. P.-C.

K-18. Paper Box Board Manufacture. JOSEPH S. SLATER. **Paper,** xxvii, 14, (Dec. 8, 1920).. A general review of the great saving in wood effected by the paper board industry which utilizes to a very large extent fibrous waste material, of some of the many uses to which paper board is being put, of the advisability of the mills making their product directly into containers, of the merits and demerits of various methods of defibering the waste paper, of recent advances in the methods of drying (Sturtevant system), with a brief mention of various mechanical features of the board mills.—A. P.-C.

K-23. Blotting and Filter Papers. G. SCHUMANN. **Papier Markt** (Jan. 1, 1921); **Pulp and Paper** xix, 131 (Feb. 3, 1921). Blotting and filter papers must be made from raw materials having porous, open structure. The chief ones used are wool and cotton fibers, and aspen soda pulp. The most satisfactory is cotton, while aspen soda is used in the manufacture of inferior grades of blotting papers. The desired properties can be developed and improved in three ways: (1) fermentation or maceration (2) Refrigeration (3) grinding in a hollander with sharp knives. Cylinder machines are generally used, rather than fourdriniers, and the drying should approximate air drying as far as possible.

The manufacture of filter paper requires the use of especially pure water, supplemented by washing with hydrochloric or hydrofluoric acid to eliminate all mineral matters. Aspen pulp can be used for inferior grades of blotting papers, but must be mixed with a stronger fiber. Bleached beech pulps yield exceptionally soft and porous half-stuff; but the wood must be carefully sorted before cooking on account of the frequent presence of resinous and waxy bodies.—A. P.-C.

L-7. Paper Textiles. W. F. SCHAPHORST (Copyright, 1920). **Paper,** xxvii, 13 (Dec. 1, 1929). Brief review of the various methods of making textiles from paper and pulp in Germany and in Scandinavia during the war and of the probability of these paper textiles competing with the exportation of cheaper clothing from the United States.—A. P.-C.

O-3; P-0. Pure Drinking Water for Industrial Plants. ARTHUR W. BUSWELL, **Paper,** xxvii, 13 (Dec. 12, 1920). In 1915 the Supreme Court of Wisconsin rendered a decision that the furnishing of a contamined drinking water supply as an "Accident" within the meaning of the Workmen's Compensation Act, and in consequence a large corporation in the Middle West recently paid $60,000 in settlement of suits for damages filed on account of sickness and death of employees resulting from contaminated drinking water furnished in its factory.—A. P.-C.

P-5. Accident Records in the Paper Mill. R. H. GUERRANT, **Paper,** xxvii, 11 (Nov. 17, 1920). Proper accident statistics help to determine the causes of accidents and enable the concentration of efforts toward remedying the conditions responsible for accidents. A satisfactory method for keeping accident records should comprise at least five essential points: (1) See that injured men report promptly; (2) Make a good record of every man reporting for treatment; (3) Notify the proper departments; (4) Get all the information for the accident report; (5) Notify the departments when the man is able to resume his work. The statistics thus obtained serve to show the causes of accidents, the extent of the disabilities, and the frequency and severity rates so that the comparisons may be established between different mills in the same industry, or even between the different industries. The frequency rate is defined as the number of lost time accidents which occur for each million hours worked, and the severity rate as the number of days lost per one thousand hours work.—A. P.-C.

R-1. Ontario Pulp and Paper Industry. W. L. EDWARDS. **Paper, xxvii, 11 (Nov. 17, 1920).** Historical sketch of the development of the industry in Ontario since it was founded in 1825 until the present day, with an outline of the improvements and developments projected for the coming year (1921).—A. P.-C.

R-1. The Paper Mills of the Pacific Coast Region. Paper, xxvii, 12 (Nov. 24, 1920). Brief enumeration of the pulp and paper mills of the Pacific coast in Canada and the United States.—A. P.-C.

R-1. Wilmington and the Chemical Industry. Chem. Met. Eng., xxiii, 1083-5 (Dec. 1, 1920). Abstracts of papers read at the Nov. 19, 1920, meeting of the American Chemical Society giving outlines of the various chemically controlled industries (exclusive of explosives) in the vicinity of Wilmington, including finishing of cotton goods, manufacture of glazed kid leather, lithophone, vulcanized fiber and papermaking.—A.P.-C.

R-2. New Cellulose Periodicals. Paper, xxvii, 11 (Nov. 17, 1920). **Cellulose-Chemie. Wissenschaft Beiblätter zu der Zeitschrift "Der Papierfabrikant".** Issued as a supplement to **Papierfabrikant,** edited by EMIL HEUSER, Darmstadt. **Zelstoffchemische Abhandlungen.** Published monthly by CARL HOFMANN, Berlin, SW 11, Germany, edited by CARL G. SCHWALBE.—A. P.-C.

R-2. Committee on Abstracts and Publications. Arrangements have been made for abstracting the British paper trade journals, while attempts are being made at a similar arrangement for Scandinavian journals. Cooperation with the American committee is being continued.—A. P-C.

R-5. Canada's Pulp and Paper Industry in 1920. A. L. DAWE, secretary, and EDWARD BECK, of the Canadian Pulp and Paper Association. **Pulp and Paper,** xix, 33-5 (Jan. 13, 1921). Compiled from the annual review numbers of the Montreal **Gazette** and the Toronto **Globe.** General review of conditions in the industry, of the reorganization of a number of the older companies, of the organization of new ones, and of the developments and improvements which are proposed for 1921.—A. P.-C.

R-5. Paper in Argentina. World's Paper Trade Review, Jan. 7, 1921, lxxv, 9, p. 16.—Argentina is still importing the finer grades of paper from the United States by the high rate of exchange has resulted in placing many orders in Germany and Sweden where prices and deliveries are more favorable. Most of the printed wall papers however are being imported from England, prices and deliveries being far better than in the United States and Canada.—A. C.

R-7. Superintendent is the Keystone of the Industry. M. G. ARGY, **Pulp and Paper,** xix, 54-5 (Jan. 20, 1921). Address of the temporary chairman at the organization meeting of the "Eastern Section of the Canadian Division of the American Pulp and Paper Mill Superintendents' Association", giving a brief outline of the organization of the Canadian Division showing the great advantage to be derived both by the industrial members and by the pulp and paper industry as a whole from the Association, and typifying the superintendent as "the keystone of the arch of industry", as he is the connecting link between Capital and Labor.—A. P.-C.

R-11. The University and Industry. General Sir ARTHUR CURRIE, K.C.M.G., **Pulp and Paper,** xix, 95-7 (Jan. 27, 1921); **Paper,** xxvii, 23 (Feb. 9, 1921). Address at the luncheon of the Canadian Pulp and Paper Association, Montreal, January 21, 1921.—A. P.-C.

R-13. Annual Meeting of the Pulp and Paper Association, Montreal, Jan. 21, 1921.— **Pulp and Paper,** xix, 99-108 (Jan. 27, 1921); **Paper,** xxvii, 22 (Feb. 22, 1921), 23 (Feb. 9, 1921). Texts of the address of GEORGE CHAHOON, Jr., retiring president, in which are reviewed the outstanding events affecting the association, and the reports of the chairman of the newsprint, mechanical, pulp, book and writing, board, woodlands, coated paper, felt paper, wrapping paper, and technical, sections and of the transportation department.—A. P.-C.

R-13. The Forest Products Laboratory (U.S.A.) and the Paper Manufacturer. OTTO KRESS, Paper, xxvii, 13 (Dec. 1, 1920). Brief description of the work being done for the pulp and paper industry at the Forest Products Laboratory, Madison, Wis.—A. P.-C.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 25th June.—The strike among the printers in Toronto, which it was indicated, last week, shows every prospect of being a protracted one, so far as the arriving at a settlement by agreement is concerned, still continues to exercise a depressing effect on most departments of the industry. The book-binders have given in and gone back to work—those of them who can get it. Local 91 of the International Typographical Union, last Friday, made public an offer it made to the Toronto employing printers, which their organization (the Toronto Typothetae) rejected on Wednesday in last week. The offer was to the effect that the men would return to work with the understanding that the forty-four hour week prevail, that $35.20 be the minimum wage, and that shop practices and working conditions as understood in the old agreement be maintained. The offer also provided that if a satisfactory wage scale could not be mutually agreed on, an arbitration board should be appointed to determine the wage question between $35.20 and $40, and that the contract should be for a year from the 1st June, 1921. Probably the employing printers did not take long in deciding to reject this offer—indeed their rejection of it caused little surprise among the striking printers. For it is now fairly clear that, if there is to be a settlement by agreement at all, it will be on terms very different from those just summarized as constituting the offer made on behalf of the men. But, though there may not be any settlement by agreement, there are plenty of keen observers who think that the strike will "peter out"—in fact, that it is already "petering out." According to Mr. W. A. Sutherland, secretary of the employers' organization, fifty per cent of the positions of the pressmen have been filled, and there are 227 compositors at work in shops of the Typothetae. Further, firms sympathetic with the Typothetae are said to be witholding work until the latter organization gets its own way over the matters in dispute. On the other hand, the strikers express themselves as being still confident of victory. But, however, the dispute may end, there can be no question that its continuance is having a very detrimental effect on most departments of the paper industry—and this, too, at a time when, for various other reasons, trade is abnormally quiet in so many branches of it. Altogether, as regard trade conditions, as compared with those reported on last week, it is pretty much a case of "As you were!" At outside points, it may be added, business is somewhat better than in Toronto itself.

Pulp.—"If anything," observed to the writer the representative of one of the big pulp mills, "there has recently been some improvement in the demand for pulp. But it is not of a kind to inspire much optimism. Business is still very far from normal. Stocks in the hands both of the mills and jobbers are still being reduced far too slowly."

Book Paper.—The only buying of any account that is taking place in the book market, and that of bonds and ledgers, is just for immediate requirements. Stocks are being kept down to the minimum. No further reductions have taken place, on the whole, in these and other standard lines. But there is a certain want of fixity of price.

Waste Papers.—Business is still stagnant in the cheaper grades of waste papers. But a little business is being done in the better lines of the white shavings.

Wrapping Paper.—The business doing by the jobbers is reported as being very light. Prices have undergone no alteration.

Toilets and Tissues.—The trade in these papers is reported as continuing to be good. There has been no alteration in prices.

Manufactured Stationery.—On the whole, the demand is still away below what it ought to be, but yet many manufacturers are continuing to do a fair amount of business—though always on the light side.

Box Board.—In this market again, buyers are buying only for immediate requirements. No big orders are coming along. Prices remain unaltered.

Greaseproof and Glassine.—There is little business doing in these lines, and there have been no recent changes in price.

NEW YORK MARKETS.

New York, June 25.—(Special Correspondence)—Conditions in the paper market continue very much the same as previously reported and there have been no developments of note this week. Demand is still limited, consumers and jobbers alike confining their buying to supplies immediately and actually needed, and yet activity along certain lines appears to be broadening with the general situation, as expressed by a prominent member of the trade in New York, "looking upward rather than downward."

It is not altogether surprising that demand is no more active at present than it is, as this is the time when paper consumers as well as paper manufacturers and jobbers are compiling mid-year inventory, which naturally places a check on business. Most of the shipments made from mills to other than contract customers at present are from stock, and paper manufacturers are trying to reduce their stocks of both finished and raw product to as great an extent as possible, which has a quieting effect on manufacturing operations. There is a common belief in the trade that as soon as the inventory-taking season is over demand for most kinds of paper will pick up, while some traders are of the opinion that a good many paper users will come into the market to cover the bulk of their fall requirements early, thus stimulating business to an appreciable extent.

Conferences held in New York last week by officials of the International Paper Company and delegates of the papermakers' union with a view to coming to some agreement on the wage dispute failed of success, and the strike situation at newsprint mills remains unchanged. It was hoped that a settlement would be reached on the points at issue, but after conferring on Thursday, Friday and Saturday, the conference broke up and the mill workers' representatives departed for home Saturday night. It is now problematical which side will make the next move toward patching up the matter. That newsprint mills are



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seriously affected by the strike of operatives can be seen in the report of the Federal Trade Commission covering the print paper industry for May which shows that last month production of newsprint by United States mills dropped to 78,868 net tons, a decline of 36,540 tons, or roughly about 40 per cent, from the output of the same mills in April. It is obvious that with production at this low point it will not take very long for available stocks of print paper to be liquidated, and unless the strike is settled and mills resume operation, there is every likelihood of a dire shortage of print paper arising.

The tone of the spot newsprint market is steady and most of the sales made to transient buyers are at 5 cents a pound at mills or better. Here and there reports are received of a sale at less than 5 cents, but it is doubtful that sizable lots can be obtained at such figures, and indications are that supplies offered at the low levels represent distress holdings which sellers are willing to accept anything for in order to move. No further change has been announced in the contract basis, and there is not likely to be while present conditions obtain in the industry where consumption is running considerably in excess of the production.

Book paper mills are moderately busy on contract orders from publishers but fresh demand is slow in developing. There is no alteration in quotations on book papers. Wrappings are moving in routine fashion and mainly in small quantities at former price levels, No. 1 domestic kraft bringing between 6·50 and 7 cents per pound f.o.b. mills. Tissues are quotably steady at around 95 cents basis on No. 1 white tissue, and coarse tissues are meeting with a steadily improving demand.

Box boards are firming in price though they are still to be used at recently prevailing quotations. Some manufacturers are holding for $35 a ton on plain chip board, yet purchases have been recorded this week at $32·50 and even $30 in some few cases, while filled news board is available at $35 to $37·50 per ton at mills. Paper box makers are far from deluged with orders for their product but they are getting more business than for some time and are not hesitating to buy board when needing it, with the result the general complexion of the market is changing for the better.

There is nothing of importance to report in fine papers. Demand at best is narrow, and the buying being done is against direct wants, while quotations are on a broad range—so broad, in fact, that it is difficult to say what constitute actual market price levels.

GROUND WOOD—Mechanical wood pulp holds quotably steady at around $30 a ton f.o.b. grinding plants for spruce ground wood of prime quality for prompt shipment, and the market has developed no new turn of apparent importance. Board mills are buying in spasmodic style and on the whole are absorbing a fair volume of pulp, and there is also some demand from manila, tissue and newsprint mills, but in spite of authoritative reports that current production is considerable under normal owing to the strike of mill workers, unfavorable water conditions, and the like, buyers do not seem to experience difficulty in locating all the supply desired. There is a feeling that unless the strike of mill operatives is settled, ground wood may become very scarce later in the summer, but this is having no material influence on prices at the moment.

CHEMICAL PULP—The tone of the chemical wood pulp market is at best easy, and there is little show of important activity in any corner of the trade. Consumers are coming into view as buyers only when in immediate need of supplies, and even then are searching the market for pulp at the cheapest prices, which obviously has a softening effect on values. It is a hard matter to name accurate prices. Reports have been heard of domestic bleached sulphite selling at as low as 5 cents a pound and of domestic easy bleaching being offered at less than 3·75 cents and No. 1 domestic kraft at 3 cents. Probably small lots can be obtained at these low figures but the probabilities are higher prices would have to be paid for sizable tonnage. News grade sulphite is about the firmest grade in the market and producers are mostly demanding at least 3·50 cents a pound at pulp mills for this description of sulphite. Thehe is practically no trading in imported pulp and prices are mainly nominal.

RAGS—The outstanding development in the rag market is the slowing up of demand for roofing stock. Those mills which earlier in the month were quite active buyers are now mostly ignoring offerings, with the result prices on roofing rags have come down slightly, dealers now being willing to sell No. 1 satinets at 80 to 85 cents a hundred pounds at shipping points and No. 2 packing at 70 to 75 cents. The remainder of the market rules exceedingly quiet. New cuttings are little wanted by paper mills and are available, with the exception of several grades like unbleached muslins and white lawns, at lower prices than those asked by dealers. Old rags are moving slowly. Writing paper manufacturers are buying few old whites or thirds and blues, and prices are irregular and easy. No. 1 repacked whites are offered at 5·25 cents a pound f.o.b. New York, No. 2 repacked at 3·25 cents, repacked blues at

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PAPER STOCK—Some grades of old paper hold steady in price and are moving toward consuming plants in fairly good volume; others are scarcely wanted by mills and are tending lower in value. Old kraft paper still leads in demand and dealers are asking 2.10 to 2.15 cents a pound at shipping points for No. 1 packing. Soft white shavings have firmed up somewhat and are held at 2.25 cents as a minimum, with some packers asking a quarter of a cent higher. No. 1 mixed paper is sought in a little larger quantity by board mills and is bringing 30 to 32½ cents per hundred f.o.b. New York. Folded newspapers on the other hand, are in slow demand and are readily available at 37½ cents New York. Flat stock is a trifle down in price, No. 1 old books and magazines being offered at 90 cents a hundred, and mixed books at 70 cents.

OLD ROPE AND BAGGING—Old manila rope is quotably steady at 4 cents per pound f.o.b. New York, and although mills have stopped buying to an extent, there is a fair movement on back orders and the market appears to be fairly well cleaned up on supplies. Old bagging has not improved its market position and rules exceedingly dull, with No. 1 scrap bagging offered at $1 per hundred pounds, roofing bagging at 60 cents and No. 1 gunny at $1·25 cents.

NEWSPRINT PAPER REVIEW FOR MAY, 1921.

The effect of the strike on the production of newsprint in the United States is shown by the following extract from the report of the Federal Trade Commission:

	Number of Mills.	Production.	Stocks on hand end of month.
		Net tons.	
Total Newsprint—			
May, 1921	87	78,868	31,198
May, 1920	92	129,230	22,833
May, 1919	70	105,819	27,084
May, 1918	66	111,242	26,122
Total (5 mos.) 1921	—	528,678	31,198
Total (5 mos.) 1920	—	629,244	22,823
Total (5 mos.) 1919	—	556,245	27,084
Total (5 mos.) 1918	—	527,626	26,122
Standard News—			
May, 1921	69	73,181	26,955

Note.—Above figures for total newsprint do not include hanging paper.

The average production of total newsprint and standard news, based upon the total combined production for the years 1918, 1919 and 1920, amounted to 113,925 tons of total newsprint and 10,650 tons of standard news, for a period corresponding to May. The actual production amounted to 78,868 tons of total newsprint and 73,181 tons of standard news, which for total newsprint was 30 per cent below the average for the three-year period and for standard news about 28 per cent below the average.

The production of newsprint for May, 1921, compared with May, 1920, shows a decrease, amounting to 39 per cent for total newsprint and about 39 per cent for standard news.

The production for May, 1921, compared with May, 1919, shows a decrease of 25 per cent for total newsprint and a decrease of 24 per cent for standard news.

The decrease of production for May, 1921, over May, 1918, amounted to 29 per cent for total newsprint and 22 per cent for standard news.

Mill stocks of both total newsprint and standard news decreased during May, 1921.

Stocks of rolls in the hands of jobbers at the end of May were 156 tons less than the stocks in the hands of the same jobbers at the beginning of the month. Stocks of sheets were 419 tons less at the end of May than at the beginning of the month. The net decrease in the total stocks of newsprint in the hands of jobbers at the end of May amounted to 575 tons.

Commitments to sell roll news were 3,884 tons greater than commitments to buy. Commitments to sell sheet news, were 722 tons less than commitments to buy. Total commitments to sell both rolls and sheets were 3,162 tons greater than commitments to buy.

Publishers' stocks decreased 20,613 tons during the month. The average daily tonnage used during May was 38 tons less than the average used in April.

Seventy-eight publishing concerns held about 72 per cent of the tonnage on hand at the end of the month.

Publishers' stocks and transit tonnage on May 31st represented slightly less than 45 days' supply at the existing rate of consumption.

The domestic consumption of standard news, by metropolitan dailies using between one-half and three-fourths of a million tons annually, for May, 1921, when compared with May, 1920, shows that the consumption for the month of May, 1921, was practically the same as for May, 1920, and increased slightly less than 8 per cent for May, 1921, over May, 1919.

The imports of newsprint for April, 1921, were 4,685 tons more than for April, 1920. The exports for April, 1921, were 1,789 tons less than for April, 1920.

The imports of groundwood pulp for April, 1921, were 3,729 tons less than for April, 1920. The exports of domestic wood pulp were 751 tons less than for April, 1920.

Average Prices Paid by Publishers.

The weighted average price of contract deliveries from domestic mills to publishers during May, 1921, f.o.b. mill, in carload lots, for standard news in rolls was $5.248 per 100 pounds. This weighted average is based upon May deliveries of about 39,000 tons on contract involving a total tonnage of approximately 600,000 tons of undelivered paper manufactured in the United States.

The weighted average contract prices based on deliveries from Canadian mills of about 21,000 tons of standard roll news in carload lots, f.o.b. mill, in May, 1921, was $5.497 per 100 pounds. This weighted average is based upon the May deliveries on contracts involving about 270,000 tons of undelivered Canadian paper.

The weighted average market price for May of standard roll news in carload lots f.o.b. mill, based upon domestic purchases totaling about 7,000 tons was $5.056 per 100 pounds.

He who has conferred a kindness should be silent, he who has received one should speak of it.—Seneca.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., July 7th, 1921. No. 27

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Published every Thursday by the Industrial and Educational Publishing Company, Limited. Garden City Press. Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

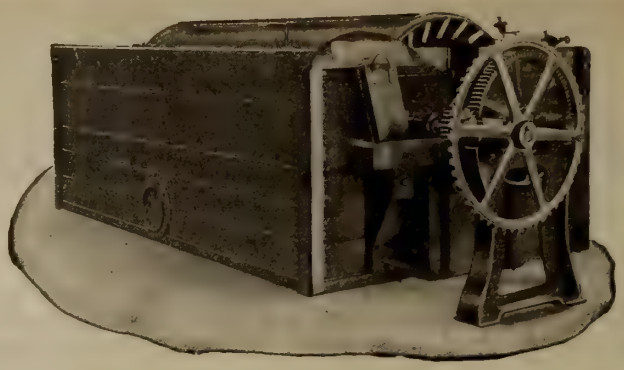
Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

THE UNITED STATES TARIFF.

No one who reads the terms of the Tariff Bill introduced last week in the United States Congress will accuse Mr. Fordney and his confreres of being impartial to the interests of the American paper maker. The bill not only provides for a high duty on the kinds of paper and paper products accustomed to the protecting shade of the tariff wall, but carries a kick for any country that may presume to protect its own industries by encouraging the conversion at home of its own resources. It can hardly be called a coincidence that the items which are nominally on the free list, *if* there is no export restriction on such products on the wood used in making them, and the materials on which the American newspaper publisher depends for his paper supply. It is significant too, that standard news and wood pulp constituted 92.7 per cent of Canada's total export of paper and pulp in May, and the States took 78.9 per cent of these exports. These items are on the free list, *provided* that the country from which they come, or any subdivision of it, does not impose any tax or restriction on the export of such product or the raw material of which it is made. The bill even provides that, in the case of pulp, if there isn't enough of this to be punished, the penalty passes on to newsprint. The penalty is really a joke, when one consider that this is to take the form of a duty of 10 per cent *ad valorem* on newsprint and wood pulp. This duty, say on 5 cent paper, would add ½ cent per pound. The American publishers will, no doubt, cheerfully pay this extra price for the privilege of buying good Scandinavian or German paper — and, of course, the same increase on American made paper so as to help their countrymen pay for their (joint) folly in depleting their own forests.

The blight even extends to other printing paper. This is saddled with a duty of 1 cent per pound plus 10 per cent *ad valorem* any way, but if imported from a country that values its pulpwood enough to place restriction on its use, there is an additional 10 per cent put on.

Other papers do not seem to call for any apparent discrimination as regards the country of their origin. Many of these are not made now in Canada in sufficient amounts to disturb paper makers in the Dominion with respect to the market in the States. Also, since the newspaper is not vitally interested, there is not likely to be much audible objection to the duties involved. The duties on items of some interest here are, briefly:

Boards, 10 per cent *ad valorem.*

Coated paper, 5 cents per pound.

Tissues, weighing less than 8 pounds per ream, 6 cents and 15 per cent; above 8 pounds, 5 cents and 15 per cent.

Waxed paper, grease proof, etc., 2 cents and 15 per cent.

Writings, Bristols, etc., 3 cents and 15 per cent.

Plain envelopes, 5 per cent.

Plain hanging, 10 per cent.

Blotting, 2 cents and 10 per cent.

Wrapping, 23 per cent.

Papers, not specially provided for, 23 per cent.

Perhaps the high duty on Wrapping Paper is an indirect way of protecting the newsprint manufacturers; many of whom have changed news machines to other grades.

It is safe to say that Canadian newsprint manufacturers are not greatly worried over the tariff. The American Press has been, for many years, the successful champion of duty free newsprint. The matter of pulpwood restrictions is as broad as it is long. The cost of their paper is not affected. Adding 10 percent to the cost of Canadian paper will not make the cost of wood to the American mill a cent less. And the chance of dropping the provincial forestry regulations is so remote that the American publisher might just as well begin his campaign for free paper unless he is magnanimous enough to pay a bounty to the American paper mill as recompense for his insistence in the past for newsprint at such a ridiculous price that the forest was sacrificed to meet it.

With regard to the extent of the application of the Penal Clause, it would be interesting to learn whether any European countries have any regulations covering the export of raw woods, and also how the paper mills like the idea of an import duty on pulp, which would be giving a handicap to the mill making its own pulp.

COBWEBS.

Mr. G. C. Piche, Chief Forester for Quebec, has returned from an inspection of forestry operations in France and Sweden. The Province has sent several talented young men to study forest practice in Europe. All of which is in the direction of adding to the life and value of the Canadian forest.

The account of the meeting of the Canadian Paper Box Manufacturers' Association had to be postponed till next issue.

Exports of pulpwood in May 1920 were 1-3 less than in May 1920, in cords.

WHAT THE KODAK GOT.



TECHNICAL SMILERS.

(From left to right) Mr. George Carruthers, Chairman Technical Section; Mr. Percy B. Wilson, President, Canadian Pulp and Paper Association; Mr. A. L. Dawe, Secretary, Technical Section and C. P. & P. A.



THE BIG RED AUTO.

Chief Berthiaume is not taking these "criminals," Geo. Carruthers, Chairman Clem. King of the entertainment committee and "P. B." Wilson to jail, but is personally conducting the Technical Section around Three Rivers and Cap Madeleine.



RIGHT ON THE JOB.

Twenty-five seconds after Chief Berthiaume sent in the alarm, this company of fire fighters was on the spot, 10 seconds later the crew from another station thundered by. People in Three Rivers are proud of their police and fire departments.

BUSH FIRES BAD IN ONTARIO.

Cobalt, July 5.—Bush fires sweeping over Northern Ontario have already claimed two lives and caused losses of property running into millions of dollars. New Ontario is menaced by another conflagration such as visited the country ten years ago, and only early rain can save it. Trainmen coming south from Porquis Junction brought news of the first casualties. Near Holland station, two young men whose names were unknown, seeking to escape the advancing flames, entered a dugout and were burned to death. The fires are reported to be particularly menacing in the vicinity of Timmins and Iroquois Falls. In the lower Abitibi region, 50,000 cords of pulpwood were licked up by the flames yesterday, according to reports.

A considerable quantity of pulpwood, as well as railway property, has been burned at Hearst station, and in the region of Englehart a great quantity of timber has been destroyed.

Smoke from the Ontario fires has been noticeable in the vicinity of Montreal.

G. C. PICHE RETURNS.

Quebec, July 4.—G. C. Piche, chief of the Forestry Service of the province, has returned after spending two months in Europe, the guest of the Canadian Pulp and Paper Association, touring France, Belgium and Sweden, spending a full month in the latter country to study the forestry organization.

"The trip was very well organized and a great benefit to those who wished to study the forestry questions, and I think that the information I have gathered is most precious," said Mr. Piche. "Sweden's forestry organization has been in operation since 1827, and, though not the oldest in Europe, it is a very progressive one. The forests in Sweden are very carefully looked after, and the process is most modern.

"In France the forestry students who have been sent there by the province are getting along very well and are considered among the best pupils. They will certainly be of great use when they return here."

Newsprint is the bright spot in trade figures for May, in spite of the strike; while shipments for May fell off, the total for two months is ahead of last year. There is a comparative drop, however, because new equipment is not fully employed.



ARRIVAL AT THREE RIVERS.

At the left are Mr. W. Adamson and Harry Kay from Bury, England; in the center are "Jawn" O'Reilly and See-Dee Jentz, with the smiles; Sec. Dawe (hatless) is not selling shoelaces, but distributing T. S. pins.

Provisions of the Fordney Tariff Bill with Respect to Paper and Timber Products

Sections of the Fordney Tariff Bill, introduced in the House of Representatives on June 29, 1921, with respect to paper and paper products and wood and the manufactures thereof, are as follows:

FREE LIST.

The Free List includes:

News Print Paper.

Par. 1658. Standard news print paper: Provided, That whenever the President shall ascertain as a fact that any country, dependency, province, or other subdivision of government forbids or restricts in any way (whether by law, order, regulation, contractual relation, or otherwise, directly or indirectly) the exportation of, or imposes any export duty, export charge of any kind whatever, either directly or indirectly (whether in the form of additional charge or license fee, or otherwise), upon printing paper, wood pulp, or wood for use in the manufacture of wood pulp, he may by proclamation declare such ascertainment setting forth the facts; whereupon, and until said proclamation shall be revoked, there shall be levied, collected, and paid upon standard news print paper, when imported either directly or indirectly from such country, dependency, province, or other subdivision of government, a duty of 10 per centum ad valorem, and, in addition thereto, an amount equal to the highest export duty or other export charge imposed by such country, dependency, province, or other subdivision of government, upon either an equal amount of printing paper or an amount of wood pulp for use in the manufacture of wood pulp necessary to manufacture such printing paper.

Wood Pulp.

Par. 1609. Mechanically ground wood pulp, chemical wood pulp, unbleached or bleached: Provided, That whenever the President shall ascertain as a fact that any country, dependency, province, or other sub-division of government forbids or restricts in any way (whether by law, order, regulation, contractual relation, or otherwise, directly or indirectly) the exportation of, or imposes any export duty, export license fee, or other export charge of any kind whatever, either directly or indirectly (whether in the form of additional charge or license fee, or otherwise), upon printing paper, wood pulp, or wood for use in the manufacture of wood pulp, he may by proclamation declare such ascertainment setting forth the facts, whereupon, and until said proclamation shall be revoked, there shall be levied, collected, and paid upon mechanically ground wood pulp and chemical wood pulp, unbleached or bleached, when imported either directly or indirectly from such country, dependency, province, or other subdivision of government, a duty of 10 per centum ad valorem, and, in addition thereto, an amount equal to the highest export duty or other export charge imposed by such country, dependency, province, or other subdivision of government, upon either an equal amount of wood pulp or an amount of of wood necessary to manufacture such wood pulp, or an amount of printing paper ordinarily manufactured from such wood pulp.

Par. 1640. Rag Pulp.

Logs, Bolts, Etc.

Par. 1682. Wood: Logs and round, unmanufactured timber, firewood, handle bolts, shingle bolts, gun blocks for gunstocks, rough hewn or sawed or planed on one side, sawed boards, planks, deals, and other lumber, not further manufactured than sawed, planed, and tongued and grooved; clapboards, laths, ship timber; all of the foregoing is not specially provided for: Provided, That if there is imported into the United States any of the foregoing lumber, planed on one side or more sides and tongued and grooved, manufactured in or exported from any country, dependency, province, or other subdivision of government, which imposes a duty upon such lumber exported from the United States, the President may enter into negotiations with such country, dependency, province, or other subdivision of government, to secure the removal of such duty, and if such duty is not removed he may by proclamation declare such failure of negotiations, and in such proclamation shall state the facts upon which his action is taken together with the rates imposed, and make declaration that like and equal rates shall be forthwith imposed as hereinafter provided; whereupon, and until such duty is removed, there shall be levied, collected, and paid upon such lumber, when imported directly or indirectly from such country, dependency, province, or other subdivision of government, a duty equal to the duty imposed by such country, dependency, province, or other subdivision of government upon such lumber imported from the United States.

Par. 1683. Woods: Sticks of partridge, hair wood, pimmento, orange, myrtle, bamboo, rattan, India, malacca, joints, and other woods not specially provided for in the section in the rough, or not further advanced than cut into lengths suitable for sticks for umbrellas, parasols, sunshades, whips, fishing rods, or walking canes.

DUTIABLE LIST.

The provisions for duties upon paper and paper products and articles made of wood are:

Schedule 13.—Papers and Books.

Par. 1301. Printing paper, not specially provided for, one-fourth of 1 per cent per pound and 10 per centum ad valorem: Provided, That if any country, dependency, province, or other subdivision of government shall forbid or restrict in any way the exportation of (whether by law, order, regulation, contractual relation, or otherwise, directly or indirectly), or impose any export duty, export license fee, or other export charge of any kind whatsoever (whether in the form of additional charge or license fee or otherwise) upon printing paper, wood pulp, or wood for use in the manufacture of wood pulp, the President may enter into negotiations with such country, dependency, province or other subdivision of government to secure the removal of such prohibition, restriction, export duty, or other export charge, and if it is not removed he may, by proclamation, declare such failure of negotiations setting forth the facts. Thereupon, and until such prohibition, restriction, export duty, or other export charge is removed, there shall be imposed upon printing paper provided for in this paragraph, when imported either directly or indirectly from such country, dependency, province, or other subdivision of government, an additional duty of 10 per centum ad valorem and in addition thereto an amount equal to the highest export duty or other export charge imposed by such country, dependency, province, or other subdivision of government, upon either an equal amount of printing paper or an amount of wood pulp or wood for use in the manufacture of wood pulp necessary to manufacture such printing paper.

Par. 1302. Paper board and pulpboard, including cardboard, and leather board or compress leather, not laminated, glazed, coated, lined, embossed, printed, decorated or ornamented in any manner, nor cut into shapes for boxes or other articles and not specially provided for, 10 per centum ad valorem: Provided, That for the purposes of this Act any of the foregoing less than nine one-thousandths of an inch in thickness shall be deemed to be paper; sheathing paper, roofing paper, deadening felt, sheathing felt, roofing felt or felt roofing, whether or not saturated or coated, 10 per centum ad valorem.

Par. 1303. Filter masse or filter stock, composed wholly or in part of wood pulp, wood flour, cotton or other vegetable fiber, 1½ cents per pound and 15 per centum ad valorem; indurated fibre ware, masks, composed of paper pulp or papier-mache, manufactures of pulp, and manufactures of papier-mache, not specially provided for, 23 per centum ad valorem.

Par. 1304. Papers commonly known as tissue paper, stereotype paper, and copying paper and all papers not specially provided for in this section, weighing not over eight pounds to the ream of four hundred and eighty sheets on the basis of twenty by thirty inches, and whether in reams or other form, 6 cents per pound and 15 per centum ad valorem; if weighing over eight pounds and less than twelve and one-half pounds to the ream, 5 cents per pound and 15 per centum ad valorem; crepe paper, 6 cents per pound and 15 per centum ad valorem: Provided, That no article composed wholly or in chief value of one or more of the papers specified in this paragraph shall pay a less rate of duty than that imposed upon the component paper of chief value of which such article is made.

Par. 1305. Papers with coated surface or surfaces, not specially provided for, 5 cents per pound; papers with coated surface or surfaces, embossed or printed otherwise than lithographically, and papers wholly or partly covered with metal

*The Pulp and Paper Magazine is able to make what is probably the first full publication in Canada of the provisions of the Fordney Tariff Bill, through the courtesy of the News Print Service Bureau and the Secretary of the Canadian Pulp and Paper Association.

or its solutions (except as herein provided), or with gelatin or flock, 5 cents per pound and 15 per centum ad valorem; papers, including wrapping paper, with the surface or surfaces wholly or partly decorated or covered with a design, fancy effect, pattern, or character, whether produced in the pulp or otherwise, except by lithographic process, 4½ cents per pound, and in addition thereto, if embossed, or printed otherwise than lithographically, or wholly or partly covered with metal or its solutions, or with gelatin or flock, 17 per centum ad valorem: Provided, That paper wholly or partly covered with metal or its solutions, and weighing less than fifteen pounds per ream of four hundred and eighty sheets, on the basis of twenty by twenty-five inches, shall pay a duty of five cents per pound and 17 per centum ad valorem; gummed papers, including decalcomania paper not printed, 5 cents per pound; cloth-lined or reinforced paper, 5 cents per pound and 17 per centum ad valorem; papers with paraffin or wax-coated surface or surfaces, vegetable parchment paper, grease-proof and imitation parchment papers which have been supercalendered and rendered transparent or partially so, by whatever name known, all other grease-proof and imitation parchment paper, not specially provided for, by whatever name known, 2 cents per pound and 15 per centum ad valorem; bags, printed matter other than lithographic, and all other articles, composed wholly or in chief value of any of the foregoing papers, not specially provided for, and all boxes of paper or papier-mache or wood covered or lined with any of the foregoing papers or lithographed paper, or covered or lined with cotton or other vegetable fiber, 5 cents per pound and 20 per centum ad valorem; plain basic paper for albumenizing, sensitizing, baryta coating, or for photographic or solar printing processes, 3 cents per pound and 15 per centum ad valorem; albumenized or sensitized paper or paper otherwise surface coated for photographic purposes, 3 cents per pound and 20 per centum ad valorem; wet transfer paper or paper prepared wholly with glycerin or glycerin combined with other materials, containing the imprints taken from lithographic plates, 30 per centum ad valorem.

Par. 1306. Pictures, calendars, cards, labels, flaps, cigar bands, placards, and other articles composed wholly or in chief value of paper lithographically printed in whole or in part from stone gelatin, metal, or other material (except boxes, views of American scenery or objects, and music, and illustrations when forming part of a periodical or newspaper, or of bound or unbound books, accompanying the same), not specially provided for, shall pay duty at the following rates: Labels and flaps, printed in less than eight colors (bronze printing to be counted as two colors), but not printed in whole or in part in metal leaf, 20 cents per pound; cigar bands of the same number of colors and printings, 30 cents per pound; labels and flaps printed in eight or more colors (bronze printing to be counted as two colors), but not printed in whole or in part in metal leaf, 30 cents per pound; cigar bands of the same number of colors and printings, 40 cents per pound; labels and flaps printed in whole or in part in metal leaf, 50 cents per pound; cigar bands, printed in whole or in part in metal leaf, 55 cents per pound; all labels, flaps, and bands, not exceeding ten square inches cutting size and dimensions, if embossed or die-cut, shall pay the same rate of duty as hereinbefore provided for cigar bands of the same number of colors and printings (but no extra duty shall be assessed on labels, flaps, and bands for embossing or die-cutting); fashion magazines or periodicals, printed in whole or in part by lithographic process, or decorated by hand, 8 cents per pound; decalcomanias in ceramic colors, weighing not over one hundred pounds per one thousand sheets on the basis of twenty by thirty inches in dimensions, 70 cents per pound and 15 per centum ad valorem; weighing over one hundred pounds per one thousand sheets on the basis of twenty by thirty inches in dimensions, 22 cents per pound and 15 per centum ad valorem; if backed with metal leaf, 65 cents per pound; all other decalcomanias, except toy decalcomanias, 40 cents per pound; all other articles than those heretofore specifically provided for in this paragraph, not exceeding eight one-thousandths of an inch in thickness, 20 cents per pound; exceeding eight and not exceeding twenty one-thousandths of an inch in thickness, and less than 35 square inches cutting size in dimensions, 8½ cents per pound; exceeding thirty-five square inches cutting size in dimensions, 8 cents per pound, and in addition thereto on all of said articles exceeding eight and not exceeding twenty one-thousandths of an inch in thickness, if either die-cut or embossed, one-half of 1 per cent per pound; if both die-cut and embossed, 1 cent per pound; exceeding twenty one-thousandths of an inch in thickness, 6 cents per pound: Provided, That in the case of articles hereinbefore specified the thickness which shall determine the rate of duty to be imposed shall be that of the thinnest material found in the article, but for the purposes of this paragraph the thickness of lithographs mounted or pasted upon paper, cardboard, or other material shall be the combined thickness of the lithograph and the foundation on which it is mounted or pasted, and the cutting size shall be the area which is the product of the greatest dimensions of length and breadth of the article, and if the article is made up of more than one piece the cutting size shall be the combined cutting sizes of all of the lithographically printed parts in the article.

Par. 1307. Writing, letter, note, drawing, handmade paper and paper commercially known as handmade paper and machine handmade paper, Japan paper and imitation Japan paper by whatever name known, and ledger, bond, record, tablet, typewriter, manifold, and onionskin and imitation onionskin paper, Bristol board of the kinds made on the Fourdrinier machine, calendered or uncalendered, 3 cents per pound and 15 per centum ad valorem; but if any of the foregoing is ruled, bordered, embossed, printed, lined, or decorated in any manner, other than by lithographic process, it shall pay 10 per centum ad valorem in addition to the foregoing rates.

Par. 1308. Paper envelopes not specially provided for, folded or flat, if plain, shall pay the same rate of duty as paper from which made and 15 per centum ad valorem; if bordered, embossed, printed, tinted, decorated, or lined, 10 per centum ad valorem in addition to the foregoing rates.

Par. 1309. Jacquard designs on ruled paper, or cut on Jacquard cards, and parts of such designs, 23 per centum ad valorem; hanging paper, not printed, lithographed, dyed, or colored, 10 per centum ad valorem; paper hangings with paper back or composed wholly or in chief value of paper, 5 cents per pound; papers hangings printed, lithographed, dyed, or colored, 20 per centum ad valorem; wrapping paper not specially provided for, 23 per centum ad valorem; blotting paper, 2 cents per pound and 10 per centum ad valorem; filtering paper, 5 cents per pound and 15 per centum ad valorem; paper not specially provided for, 23 per centum ad valorem.

Par. 1310. Books of all kinds, bound or unbound, including blank books, slate books and pamphlets, drawings, engravings, photographs, etchings, maps, charts, music in books or sheets and printed matter, all the foregoing not specially provided for, 20 per centum ad valorem; books bound wholly or in part in leather, the chief value of which is in the binding, not specially provided for, 33-1/3 per centum ad valorem; books of paper or other material for children's use, printed lithographically or otherwise, not exceeding in weight twenty-four ounces each, with more reading matter than letters, numerals, or descriptive words, 20 per centum ad valorem; booklets, printed lithographically or otherwise, not specially provided for, 7 cents per pound; booklets, wholly or in chief value of paper, decorated in whole or in part by hand or by spraying, whether or not printed, 15 cents per pound; all post cards (not including American views), plain, decorated, embossed, or printed except by lithographic process, 26 per centum ad valorem; views of any landscape, scene, building, place or locality in the United States, on cardboard or paper, not thinner than eight one-thousandths of an inch, by whatever process printed or produced, including those wholly or in part produced by either lithographic or photogelatin process (except show cards), occupying thirty-five square inches or less of surface per view, bound or unbound, or in any other form, 15 cents per pound and 20 per centum ad valorem; thinner than eight one-thousandths of one inch, $2 per thousand; Christmas and other greeting cards, printed lithographically or otherwise, or decorated in whole or in part by hand or by sprayying, 30 per centum ad valorem.

Par. 1311. Photograph, autograph, scrap, post-card and postage-stamp albums, and albums for phonograph records, wholly or partly manufactured, 23 per centum ad valorem.

Par. 1312. Playing cards, 60 per centum ad valorem.

Par. 1313. Paper and paper board and pulpboard, including cardboard and leatherboard or compress leather, embossed, cut, die-cut, or stamped into designs or shapes, such as initials, monograms, lace, borders, bands, strips, or other forms, or cut or shaped for boxes or other articles, plain or printed, but not lithographed, and not specially provided for; paper board and pulpboard, including cardboard and leatherboard or compress leather, laminated, glazed, coated, lined, printed, decorated, or ornamented in any manner; press boards and press paper, 23 per centum ad valorem; stereotype-matrix mat or board, 25 per centum ad valorem; wall pockets, composed wholly or in chief part of paper, papier-mache, or paper board, whether or not die-cut, embossed, or printed lithographically or otherwise; boxes, composed wholly or in chief value of paper, papier-mache, or paper board, and not specially provided for; manufactures of paper, or of which paper is the component material of chief value, not specially provided for, 26 per centum ad valorem.

Schedule 4.—Wood and Manufactures of

Par. 401. Timber, hewn, sided or squared otherwise than by sawing (not less than eight inches square) and round timber used for spars or in building wharves, one-half of 1 cent per cubic foot.

Par. 402. Logs of fir, spruce, cedar, or Western hemlock, $1 per thousand feet board measure: **Provided,** That any such class of logs cut from any particular class of lands shall be exempt from such duty if imported from any country, dependency, province, or other subdivision of government which has, at no time during the twelve months immediately preceding their importation into the United States, maintained any embargo, prohibition, or other restriction (whether by law, order, regulation, contractural relation or otherwise, directly or indirectly) upon the exportation of such class of logs from such country, dependency, province, or other subdivision of government, if cut from such lands.

Par. 403. Brier root or brier wood, ivy, or laurel root, and similar wood unmanufactured, or not further advanced than cut into blocks suitable for the articles into which they are intended to be converted, 10 per centum ad valorem.

Par. 304. Logs, sawed boards, planks, deals, and all other forms of cedar commercially known as Spanish cedar, lignum-vitae, lancewood, ebony, box, granadilla, mahogany, rosewood, satinwood, Japanese white oak and Japanese maple, not further manufactured than sawed, 15 per centum ad valorem; veneers of wood, and wood unmanufactured, not specially provided for, 20 per centum ad valorem.

Par. 405. Paving posts, railroad ties, and telephone, trolley, electric light, and telegraph poles of cedar or other woods 10 per centum ad valorem.

Par. 406. Hubs for wheels, posts, heading bolts, stave bolts, last blocks, wagon blocks, car blocks, heading blocks, and all like blocks or sticks, roughhewn, sawed or bored, 10 per centum ad valorem.

Par. 407. Pickets, palings, hoops. and staves of wood of all kinds, 10 per centum ad valorem.

Par. 408 Shingles, 50 cents per thousand.

Par. 409. Casks, barrels, and hogsheads (empty), sugar-box shooks, and packing boxes (empty), and packing-box shooks, of wood, not specially provided for, 15 per centum ad valorem.

Par. 410. Boxes, barrels, and other articles containing oranges, lemons, limes. grape fruit, shaddocks or pomelos, 20 per centum ad valorem; **Provided,** That the thin wood, so called, comprising the sides, tops, and bottoms of orange and lemon boxes of the growth and manufacture of the United States, exported as orange and lemon box shooks, may be reimported in completed form, filled with oranges and lemons, by the payment of duty at one-half the rate imposed on similar boxes of entirely foreign growth and manufacture; but proof of the identity of such shooks shall be made under regulations to be prescribed by the Secretary of the Treasury.

Par. 411. Reeds wrought or manufactured from rattans or reeds, whether round, flat, split, oval, or in whatever form, cane wrought or manufactured from rattan, cane webbing, and split or partially manufactured rattan, not specially provided for in this section, 20 per centum ad valorem. For the purpose of assessing duties, hand-made reeds or cane shall be held to be comparable in value to machine-cut reeds or cane of corresponding size. Furniture made with frames wholly or in part of wood, rattan, reed, bamboo, or malacca, and covered wholly or in part with rattan, reed, grass, or fiber of any kind, 50 per centum ad valorem; split bamboo, 2 cents per pound; osier or willow, including chip of and split willow, prepared for basket maker's use, 25 per centum ad valorem; all articles not specially provided for, wholly or partly manufactured of rattan, bamboo, osier, or willow, 40 per centum ad valorem.

Par. 412. Toothpicks of wood or other vegetable substance, 25 per centum ad valorem; butchers' and packers' skewers of wood, 25 cents per thousand.

Par. 413. Porch and window blinds, baskets, curtains, shades, or screens of bamboo, wood, straw, or compositions of wood, not specially provided for, 25 per centum ad valorem; if stained, dyed, painted, printed, polished, grained, or creosoted, 30 per centum ad valorem.

Par. 414. House or cabinet furniture wholly or in chief value of wood, wholly or partly finished, and manufactures of wood or bark, or of which wood or bark is the component material of chief value, not speciallly provided for in this section, 25 per centum ad valorem.

VALUATION

Provisions for the valuation of imported articles and determination of purchase conditions are:

Sec. 402. Value.—Except as otherwise provided by law, the word "value" wherever used in this Act or in any other law relating to the appraisement or the classification of imported merchandise shall mean the price on the date of exportation of the imported merchandise at which comparable and competitive products of the United States were ordinarily sold or freely offered for sale in the usual wholesale quantities and in the customary wrappings, coverings, and containers, whether holding liquids or solids, to all purchasers in the ordinary course of trade, including all costs, charges, and expenses, in the principal market or markets of the United States; or, when such value can not be ascertained to the satisfaction of the appraising officer, shall mean the value of the imported merchandise on said date for sale (whether or not there shall be an actual sale), for consumption or use in the United States in its condition, including wrappings, coverings. and containers, whether holding liquids or solids, as imported. In determining the value for sale, appraising officers may take into consideration, among other matters, the selling price or cost of production of comparable products of the United States and of articles made therefrom or from like imported materials, not sold in usual wholesale quantities or not sold or freely offered for sale to all purchaser in the ordinary course of trade, or not sold at all, and the selling price in the United States of comparable imports, or the market value or cost of production of the imported merchandise in the foreign country, and may exclude or include all or any costs, charges, and expenses, including duties, and also profits and commission, if any, keeping always in mind the legislative intention that duties ad valorem shall be assessed upon the fair market value of the imported merchandise in the United States. No pretended sale or offer for sale, and no sale or offer for sale tending to establish a fictitious market, shall be held to establish value as herein defined; nor shall a value substantially raised or lowered at the time of exportation otherwise than in the ordinary course of trade be deemed to be of such value.

Sec. 403. Purchased.—Imported merchandise shall be deemed and held to have been "purchased" within the meaning of this Act when the price or amount to be paid or remitted therefor by a person in the United States to a person in a foreign country or to his agent or representative in the United States was fixed, agreed upon, or determined at the time of or prior to the exportation of the merchandise, whether the merchandise be shipped directly to the purchaser or to an agent of the seller or to the seller's branch house in the United States for delivery.

Sec. 404. Otherwise than by Purchase.—Merchandise shall be deemed and held to have been imported otherwise than by purchase within the meaning of this Act if, and when, the same is shipped from a foreign country to the United States without a price or consideration paid or to be paid or remitted by a person in the United States to a person in a foreign country or to his agent or representative in the United States having been fixed, agreed upon, or determined prior to such shipment.

RECIPROCITY

Provisions for the negotiation of reciprocity of agreements are:

TITLE III

Special Provisions.

Sec. 301. That whenever the President of the United States, with a view to securing reciprocal trade with any foreign country, dependency, colony, province, or other political subdivision of government, shall enter into a commercial treaty therewith concerning the admission into any such country, dependency, colony, province, or other political subdivision of government, of the goods, wares, and merchandise of the United States and their use and disposition therein, deemed to be for the interests of the United States, and in such treaty, in consideration of the advantages accruing to the United States therefrom, shall provide for the reduction of the duties imposed by this Act upon such goods, wares, or merchandise as may be designated therein of the country, dependency, colony, province, or other political subdivision of government with which such treaty shall be made as in this section provided; or shall provide for the transfer from the dutiable list of this Act to the free list thereof of such goods, wares, and merchandise, being the natural products of such foreign country, dependency, colony, province, or other political subdivision of government and not of the United States; or shall provide for the retention upon the free list of this Act of such goods, wares, and merchandise now included in said free list as may be designated therein; and when any such treaty shall have been duly ratified by the Senate and approved by Congress, and public proclamation made accordingly, then and thereafter the duties which shall be collected by the United States upon any of the designated goods, wares, and merchandise from the foreign country, dependency, colony, pro-

vince, or other political subdivision of government with which such treaty has been made shall be the duties specified and provided for in such treaty, and none other.

Sec. 302. That with a view to securing reciprocal trade and regulating the commerce of the United States with countries, dependencies, colonies, provinces, or other political subdivisions of government, producing and exporting to the United States any article of merchandise upon which a duty is imposed by the laws thereof and for these purposes, whenever and so often as the President shall be satisfied that the government of any country, dependency, colony, province, or other political subdivision thereof, imposes duties or other exactions, limitations, or embargoes upon like or similar products of the United States, which, in view of the duties imposed thereupon when imported into the United States, he may deem to be higher and reciprocally unequal and unreasonable, he shall have the power, and it shall be his duty, to suspend by proclamation said provisions of the laws of the United States imposing the duties upon such article or merchandise of such country, dependency, colony, province, or other political subdivision of government, when and for such time as he shall deem just, and in such cases and during such suspension, upon the importation of any such or similar article or merchandise into the United States whether the same is imported in the same condition as when exported from the country of exportation or has been changed in condition by manufacture or otherwise and whether the same has been imported directly from the country of production or otherwise, duties shall be levied, collected, and paid upon such article or merchandise the product of such designated country, which shall by the President be ascertained and proclaimed to be equal to the duties or other exactions, limitations, or embargoes imposed thereupon when exported from the United States to such country, dependency, colony, province, or other political subdivision of government.

Sec. 303. That whenever the President of the United States, with a view to securing reciprocal trade with foreign countries shall, within the period of three years from and after the passage of this Act, conclude an agreement with any other country or countries concerning the admission into any such country or countries of the goods, wares, and merchandise of the United States, deemed to be for the interests of the United States, and in such agreement, in consideration of the advantages accruing to the United States therefrom shall provide for the reduction during a specified period not exceeding five years of the duties imposed by this Act, to the extent of not more than 20 per centum thereof, upon such goods, wares, or merchandise as may be designated therein of the country or countries with which such agreement shall be made as in this section provided for, and when proclamation by the President of such agreement shall have been made, then and thereafter the duties which shall be collected by the United States upon any of the designated goods, wares, and merchandise from the foreign country with which such agreement has been made shall during the period provided for be the duties specified and provided for in such agreement.

To secure information to assist the President in the negotiation of such agreements are are provided for in such section, and to estimate the amount by which the duties specified in the agreement shall be lower than the duties provided for in other sections of this Act, in order to be a fair equivalent of the concessions granted by any other country or countries under the terms of the agreement, the President shall direct the United States Tariff Commission to make such investigations and to prepare such reports as may be deemed necessary.

DATE OF TAKING EFFECT

Except where otherwise specifically provided, the Act is to take effect on the day following its passage.

A Persian philosopher, being asked by what method he had acquired much knowledge, answered, "By not being prevented by shame from asking questions where I was ignorant."

Some papermakers would get ahead faster if they would ask more questions. Send them in to the Pulp and Paper Magazine.

He doth not lack an almanac, whose youth is in his soul.—Holmes.

In the last report from the Dominion Bureau of Statistics we find that the export of wood pulp to the United Kingdom in May 1921 was $697,081 compared with $196,656 in May 1920. For April and May 1921 these exports were only $13,000 less than for the same period last year. Shipments to the United States, however, were lamentably lower.

More than 75 per cent of Sweden's forests are not owned by the public, quite the reverse of conditions in Canada. Yet Sweden puts back into the forest about 50 per cent of the annual revenue therefrom. This income is about the same as the Crown lands bring to Quebec, but this Province appropriates only 10 per cent of its income from the forest for the management and up keep of this important source of wealth.

It seems that the paper trade just now is largely stationery.

It is very gratifying to have the paper mills starting work again, while differences between men and managements are being adjusted by arbitration. There has been remarkably little ill-feeling shown on either side. The principal thing to observe now is that the settlement should not be construed as a "victory" for any one.

Exports of book papers made up only 34 per cent of total paper sales abroad in May, a decrease of about 50 from May 1920.

WHERE MANILLA IS "THE" PAPER.

Cutting bills, yard requisitions, job tickets, production slips—all require a paper of sufficient strength and body to withstand rough usage, bad weather and frequent handling. Yet, because of the large quantity of such forms needed in the everyday work about the factory, low cost is essential.

The railways have long recognized the many advantages of Writing Manilla for such purposes. Its use in other industries is growing rapidly. The economy, the durability and strength of Writing Manilla make it the logical stock for forms that have to endure the rough handling of the shop or the yard.

Now, when every industry is striving hard to reduce its costs, is a good time to teach your customers the many uses of Writing Manilla. Planing mills, machine shops, foundries, factories of almost every sort, are among your prospects. Get more business for yourself by introducing buyers to Writing Manilla.

Writing Manilla made in Canadian mills by Canadian workmen is fully equal in quality to any form manilla. Specifying "Made in Canada" on your order to the dealer not only assures you of high-grade stock, but helps to keep the wheels turning in Canadian factories.

"Help to bring Canadian dollars back to par by advertising Canadian goods on Canadian paper."

A Student Apprentice in a Paper Mill

By A. B. COPPING, Winner of the Essay Contest of the Technical Section.

(Continued from Page 689)

Formation of Sheet.

Whenever possible samples were taken at the press-rolls and dried out for moisture — and some samples were even taken just before the couch roll when the mill was shutting down. Similarly great numbers of consistencies of the stock and of white water in all parts of the system were taken and in many cases Fishburn Tests of the slush were made. The averages of these tests have been arranged in their proper order on a diagram of "Sheet Formation" (Fig. 5).

Dryer Steam.

Production for running period, 99,676# = 49.838 tons.
Sheet before dryers 31.6% Stock and 68.4% water.
Sheet after dryers 91.08% Stock and 8.92% Water
8.92% of 99,676 = 8,891 # Water after dryers
91.08% of 99,676 = 90,785 # Bone-dry stock
This is same amount of stock before dryers.
Before dryers 31.6% = 90,785 #

$$100\% = \frac{90785 \times 100}{31.6}$$

= 287,294 # Stock and Water
90,785 # Stock

196,509 # Water before dryers
8,891 # Water after dryers

187,618 # Water evaporated by dryers

$$\frac{187618}{62.5} = 3{,}002 \text{ cu. ft. for } 49.838 \text{ tons,}$$

i. e., 60.2 cu. ft. water evaporated per ton paper produced.

A check test was worked out for this and the result found to be 60.0 cu. ft. water evaporated per ton paper produced.

Retention of Stock on Wire.

19-7-20.

Flow of Stock from Bird Screens to the finished paper, taken in steps.

Assume: —

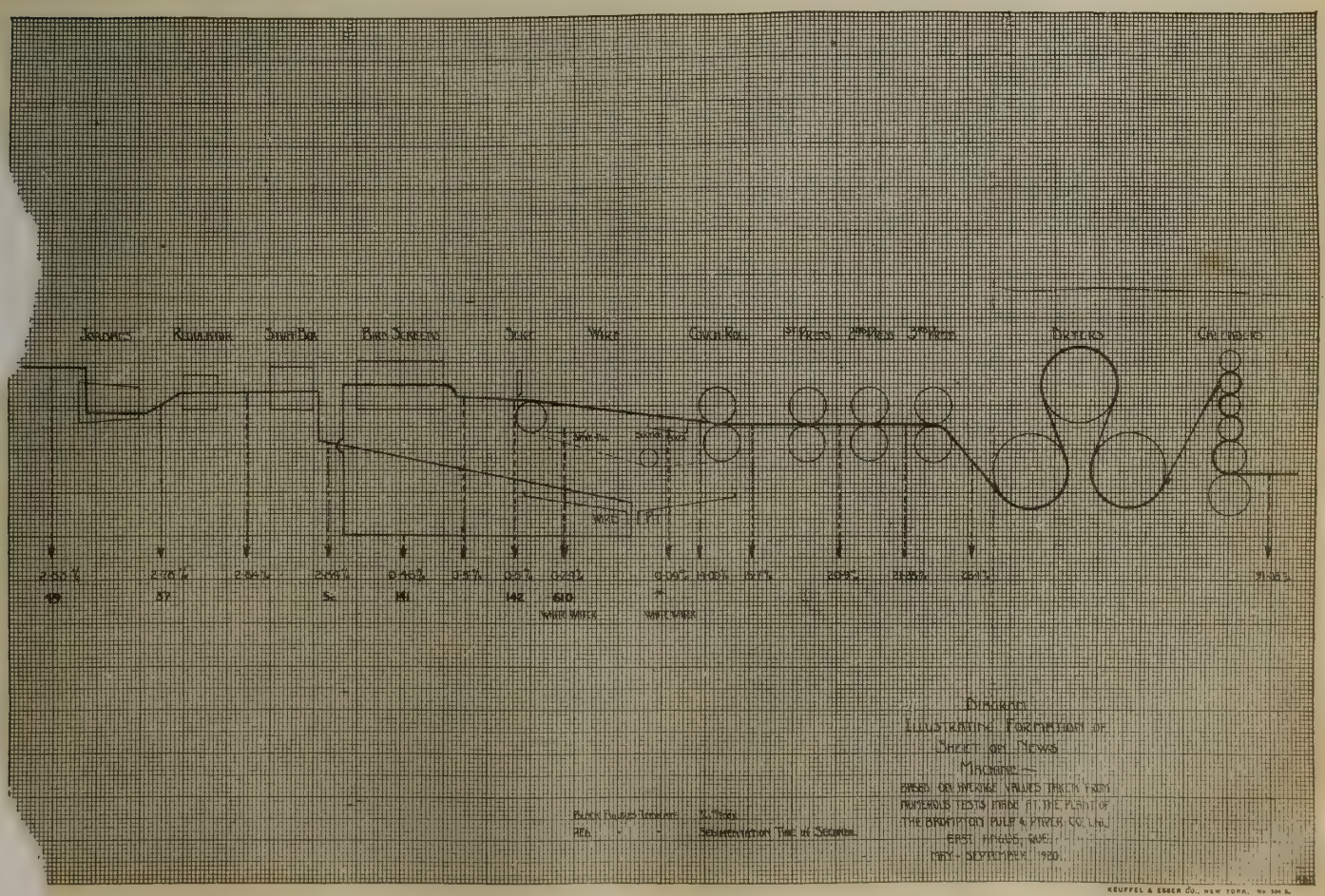
(1) 60 tons air-dry paper made per 24 hours.
(2) Speed 625 ft. per min. Time = 150"

Leaving Wire:—

The paper leaving the Calenders is 8% moisture.
The paper leaving the Wire is 82% moisture
or 18% of sheet leaving the wire is fibre and this is 92% of the finished paper, i. e., of 60 tons.
Thus 92% of 60 = 18% of slush coming off the wire expressed in tons per day, or

$$\frac{92}{100} \times 60 \times \frac{100}{18} = 306.6 \text{ tons of slush coming off wire per day} \qquad (I)$$

18% of this = 55 tons is fibre and 251.6 tons is water
= 76.4#/Min. is fibre and 350#/Min. is water.



[illegible]. — The heavy figures are Sedimentation Time [illegible]onds. One of these, 610, and two of the percentage figures, 0.24 p.c. and 0.09 p.c., refer to White Water. — Ed.

Coming on Wire:—

The slice is raised 1½'' and with this opening 405 cu. ft./Min. flow through. = 18,200 tons/day.
At a consistency of .5% there is 126.5# fibre coming on the wire/Min. (II)

Going through to the Save-All under the breast-roll is 205 cu. ft. of slush/Min. at a consistency of .24%, making 30.7 # fibre going through the wire per minute. (III)

or (II) — (III) = 95.8 # stock/Min. being carried down the wire beyond the Save-All (IV)

The white water pumped (for showers, etc.) plus the discharge from the Nash pump equals approximately the amount of white water that is being drawn through the suction boxes, when conditions are normal, and equals 5,000 tons per day; this is at a consistency of .07%, or = 4.65 #/Min. of fibre being drawn out of the paper. (V)

Thus (III) + (V) is not being used to make paper but is returned to the system. Let the amount of fibre falling through the wire between the Save-Alls and the suction boxes = (VI)

Now (IV) — (V) = 91.15 + (VI) = Amount fibre available to make paper, and = (I) = 76.4# per Min. or (VI) = 13.75#/Min. of fibre falling through the wire between the Save-Alls and the suction boxes.

Thus, the retention on the wire

$$= \frac{\text{fibre coming on wire} - \text{fibre falling through}}{\text{fibre coming on wire}}$$

$$= \frac{126.5 - (30.7 + 13.75 + 4.65)}{126.5} = 61\%$$

Talc.

Deductions from the observations made during the Talc run of July 19-22, when 5 per cent talc was added to the furnish of No. 2 machine:

1. When the run began a very good grade of paper was produced, strong, clear and good finish, and no particular trouble was experienced.

2. The retention of talc in the paper was about 1.75 per cent and thus the talc eventually collected in the system and a greater and greater proportion of talc was being carried through the slice per unit of time and therefore, since the volume of flow was constant, the amount of fibre going through per unit of time was getting less and less, and therefore the sheet was getting less and less fibre in it, and wilder and wilder paper was being produced.

3. Due to the nature of talc a considerable amount was being sucked through the sheet into the first press felt and hence the pores became gradually filled up and the paper of necessity clung to it. Thus difficulty occurred in carrying the sheet over. To a less degree due to the pressure of the rolls a similar state of affairs was going on in the second and third press felts.

4. By examination with the microscope of the stock and paper it was seen that

(a) Sulphite was good quality and long.

(b) Groundwood was poor; a lot of fines and flour and the main fibres short. Considerable dirt and slivers were also apparent.

(c) Talc seemed to take little part in the sheet formation; wild spots were well defined and holes occurred at these thin spots, but apparently were caused by improper aid given to the talc by the groundwood in the sheet formation. In addition quite long pieces of bark(?) were noticeable.

5. Blue Glass test showed poor groundwood, just as the microscope did.

6. From consistency tests it was seen that after and during the twentieths (of the month), the consistency was high and the sedimentation time very high — 160 on # 2, while on # 1 the consistency was normal but the sedimentation time very high. Thus on # 1 the presence of talc from the white water system was being felt and the stock slowing up. To counteract this the Paper-maker took out water, which during the afternoon of the twenty-first (of the month) raised the consistency, but in doing so also lowered the sedimentation time. (The reason for this does not seem apparent.) Conditions of separation became worse and worse and the consistency rose steadily.

7. The percent of talc in the dry paper was as follows on # 2.

Day	Hour	Percent
21st	10.00	3.00%
''	21.30	2.41%
22nd	14.00	2.17%
23rd	03.00	0.00%

It thus appears that it took about 15 hours for the talc to disappear.

8. To summarize, we may say that the test was unsatisfactory, production was lowered, broke accumulated, washing twice a day became necessary, the morale of the machine workers got very low, the machine-tenders ingenuity and patience were taxed too much by the disruption of events and the quality of the paper became very variable.

Temperature.

It was our aim this summer to demonstrate that if the groundwood was right there would always be the same running conditions winter and summer. T temperature both in the wire-pit and in the ro would be different. — A series of temperature ob vations were made and we are able to state that winter an attempt will be made by means of a st automatic temperature control to keep the water the wire-pit at the same temperature as it was t summer. The amount of fresh dry air sufficient t take up the moisture given off at the dryers has been calculated and the hot air fan will be run at corresponding speed and it is hoped to keep the room at summer temperature.

The dead air above the hoods coming in contact with the cold roof causes condensation. This is to be remedied by playing on the ceiling a film of hot fresh air.

Conclusion.

With these conditions taken care of, if the stock is continually uniform, we can expect better running conditions and we can insist if there is any trouble on the machine, that the trouble is not in the stock, but purely mechanical. Also, even though we have successfully operated using 8.3 % Sulphite in news print, it may reasonably be expected that this alread low rate may be maintained for long periods and p haps cut out altogether.

quantities and at lower prices. It is very gratifying to hear these words from Mr. Foster. I hope the British papermaker will take the same intereest in Canadian pulp as Mr. Fred Becker developed many years back — he being one of the great pioneers of Canadian pulp in the British market. But Mr. Foster in these days of Safe-Guarding Industries Bills has left the British printers a nice little legacy in the shape of a motto — and the printers received the motto with cheers — when he told them: "Our motto — papermakers, master printers and wholesale stationers together — would, I trust, in the future be — British paper for British purposes, Empire products for Imperial use." It was a gentle hint to "trade within the Empire", the post war slogan so easily overlooked nowadays.

Decline in Imports.

A review of the imports of paper, cardboard, strawboard, mill and leather board for May last, shows a big reduction in comparison with 1920.

Total imports of newsprint, etc., for five months were 840,896 cwts. as against 972,601 cwts in 1920. The supplies for May alone reached 269,887 cwts., as compared with 264,258 cwts. in May 1920. Notable supplies are now arriving from Newfoundland, but no paper of this quality was shipped from Canada, whereas in May 1920 the Dominion sent 372 tons.

The imports of wrapping and tissue papers in May reached 63,355 cwts., as against 397,833 cwts. in May 1920.

The total imports of all kinds of paper and boards in May amounted to 477,196 cwts., as against 1,500,895 cwts. in 1920; and for the five months January to May, 2, 153,755 cwts. — a decline of 2,959,088 cwts. under the imports for the same period in 1920.

Big Drop in Exports of British Mills.

The total exports of British mills and the paper industry in general amounted in May to 74,334 cwts., compared with 191,166 cwts. in May 1920. The figures for the first five months of the year total 648,050 cwts., a decrease of 145,009 cwts. compared with last year. Shipments during May to Canada were low in the case of printing paper (23 cwts. as against 115 cwts. in May 1920) and higher in writing paper (90 cwts. as against 14 cwts.)

British exports in May were down less than half those of 1920. There is also a notable drop in shipments of coated papers and paper hangings, while packing and wrapping papers fell off from 188,310 cwts. in 1920 to 44,862 cwts. in 1921 for the first five months of the year.

Many mills still remain closed in the United Kingdom, owing to the Miners' strike in the coal industry, while others are running on short time.

Wood Pulp Imports—Canadian Supplies.

There is a big falling off in the supplies of wood pulp from all sources in May, except from Canada. Total, 22,215 tons in May 1921, 38,283 tons in May 1920. The value of the 22,217 tons received this year from Canada is £292,353 and Norway's value of 87,735 tons is £1,057,773.

Bleached Chemical (Dry): The only shipments received in May last were 41 tons from Canada and 316 tons from Norway, the values being respectively £1,590 and £17,690. The total shipments from January to May were 5,155 tons, as against 14,095 in 1920.

Groundwood (Dry): From Canada 21 tons in May. Total for five months, 1,105 tons from all sources as against 15,366 tons in 1920.

The pulp market in England today is dead, as regards new business, and there are no signs of the slightest revival. Prices are unchanged.

Conclusions on British Industry.

A few weeks ago I gave a review of the British paper and pulp industry, and the figures quoted in this issue of the "Pulp and Paper Magaine" will give Canadians a small insight into how things are moving this side of the Atlantic. Out of all the workers in the paper mills less than half are unemployed or on short time work, because of the coal miners' strike, and taking the whole of industry of the United Kingdom well over 2,000,000 people are idle, So that taking the imports of pulp from all sources, which have never been known to drop to such a low ebb when the ratio of trade is taken into consideration, it will easily be seen why the pulp market is lifeless today. The country is teeming with discontent and if negotiations are not soon brought to an amiable settlement, the paper workers of he United Kingdom will be joining the great army of the unemployed. The papermakers will then be suspended between the devil of the deep sea, because they will have the coal miners' strike on one side and on the other the paper workers' strike. This strike fever is ruining the pulp trade, killing the paper industry and turning the country up-side-down. The Secretary of the Papermakers' Association predicts, personally, that when the general depression is over the paper industry will be among the first to feel the flow of the revitalizing blood of prosperity through their veins. But the coal miners are in such a deplorable state now and the supplies of coal so low in the country that it would be fully October or November before any benefit could be reaped from coal supplies in the mills. The situation is serious, no matter from what view-point it is taken. The economic position was bad enough after the 1870 war, but the present post-war situation is ten times worse and no-one seems to be able to get at the bottom of it, particularly in the strikes.

Millboards, Card and Pasteboard Imports.

During May Canada shipped 204½ tons of millboards to the United Kingdom. The total imports reached 1,068 tons and the supplying countries were Germany, Sweden, Finland, United States of America, Norway.

Strawboard was imported to the extent of 3,924 tons, from Germany, United States and the Netherlands, the latter country enjoying most of the trade with the United Kingdom. Canadians would do well to take note of this in view of the surplus raw material at their disposal in the Dominion.

Cardboard and pasteboard arrives from Sweden, Norway, Germany, Netherlands, France, Switzerland and Austria. The supplies in May reached 901½ tons.

Paper Workers Balloting.

Owing to the cost of living falling — according to the Ministry of Labor — the Employers Federation of Papermakers propose a reduction of 4 cents per hour in men labor. If the cost falls another 15 points, another 3 cents per hour comes off the wages and so on pro rata. These terms are submitted to the workers.

The unions have now decided to take a ballot on the terms. The men want 3 cents off now; the

employers say 4 cents. It remains to be seen now how the ballot will work out. Naturally the workers cannot understand the rise or fall in the cost of living because legislation is so precarious. For instance the cost in living has gone down 9 points in June, but on the first July a landlord can put 10 per cent increase on a tenant's rent — and is doing it except in the case of mill hands who occupy houses under their employers free or on special terms. Should the ballot be against the acceptance of a 4 cent per hour reduction, I can foresee considerable trouble in the paper industry and particularly at a time when it is not wanted. However, the British papermaker is very sensible in labor matters and he may be able to throw oil on the troubled waters.

Norway's Strike Settled.

Labor conditions have improved in Norway and the strike is ended. The pulp and paper mills are now being opened again, but it will take some time to get things going.

In Germany the paper and pulp industry is getting a fair share of work and business. Sweden is depressed and Scandinavians report that that the German and Finnish mills are turning out keen competitors for the Swedes.

THE CORNISH CHINA CLAY INDUSTRY.

The annual meeting of the English China Clays, Ltd. was held at the Institute of Chartered Accountants, London on Wednesday May 18th. Mr. Reginald Martin (chairman and managing Director) presiding. In moving the adoption of the report and balance sheet the chairman made some very important observations upon the trade in general and also upon the magnitude of the Companies successful operations. Mr. Martin said when it is borne in mind that the results which had been achieved on an output of less than half the normal production they would, he felt sure, appeal to the shareholders as eminently satisfactory. The year opened with a distinct improvement in the demand for China Clay in March 1920 and from then on till July, trade was brisk, almost approaching what was long hoped for—a boom. In August and September there was a slight drop which continued worst until the coal strike effectually killed trade generally.

Stocks are represented by the considerable figure of £224,314 6s. 11d. investments at cost £27,126 16s. 6d., cash at bankers and in hand £68,353 14s. 7d. Debtors and amounts paid in advance £118,645 11s. 0d. and sundry assets at agencies abroad £11,435 10s. 11d. The Preference Shares £293,934 show an increase of £24,505, some representing stocks taken over from the two Companies purchased. The ordinary shares £1,269,000 show an increase of £74,000. Sundry creditors are £129,676 and the general reserve £5000. The balance brought forward from last year is £2941 14s. 0d. and the profit for the year £149,766 3s. 2d. making a total of £152,707 17s. 2d. The balance of preliminary expenses had ben entirely liquidated, and, after allowing for depreciation of stock, the Board recommended a transfer to the general reserve of £10,000, which will leave a substantial increase to carry forward, so that all concerned in that meeting will have the satisfaction of knowing that the financial position of the Company is a very strong one indeed. You have now a magnificient property said the chairman and capable of yielding all qualities of china clay from the very best that can be procured in the market, through all the grades down to the commonest, and in enormous quantities. All you want now is a return to normal conditions and good trade. One of the main essentials to the success of all big undertakings is industrial peace. I have great confidence in the innate common sense of the moderate British working man, declared Mr. Martin, and I have not the slightest doubt that it will eventually assert itself. It is only by lower prices, decreased cost of production and industrial peace that there can be any hope of a return to full-time employment and prosperity. There is one qualifying feature in connection with this Company, and that is that over 12 per cent of the employes are holders of some 10,000 ordinary shares, which indicates without doubt their entire confidence in the Company, and it gives them a direct interest in its welfare. The Chairman expressed the hope that this movement would increase because it was a source of great strength to the Company.

The question of colloidal clay had received the careful attention of the Board of Directors but through various intricacies their investigations had not reached the stage at that moment to enable them to lay before the meeting any definite report.

Mr. T. Medland Stocker, J.P. one of the joint managing Directors in seconding the adoption of the report and balance sheet said that last year had been a very difficult period and the result shown was certainly very satisfactory when the difficulties with which they had to surmount were taken into consideration. At present they were confronted with a general depression in trade, but they were hoping for a better period in the latter six months of the current year. They were hoping for something in the nature of a trade revival when the stocks of articles manufactured from china clay became exhausted. The central portion of Europe, which had taken very large quantities before the war, had absorbed very small quantities since, but the directors hoped that the whole position might soon improve and that trade relations might be resumed and that they would shortly renew their usual business activity.

The Chairman also moved a fixed dividend of 5 per cent, less income tax, on the ordinary shares, making with the interim dividend 7½ per cent for the year. Mr. Walter Sessions seconded and remarked that there was no sympathy among their workers in Cornwall or Devon with the present attitude of unrest and strike. Their employees realized the necessity of getting back to work and of getting the cost of production down. There were markets for China Clay the world over, and not only markets they could recreate, but extending markets. He was very certain when they had recovered from the temporary rebuff there was a big future for the China Clay industry. Lieut.-Col. A. O. Evans and Mr. R. Large were re-elected directors.

GRAND MERE MAN WON GOLF MATCH.

Grand'Mere put itself on the golfing map at Beaconsfield last Saturday through the splendid victory of Marcus Greer in the amateur championships with a gross score of five strokes under his nearest competitor and through the carrying off of the handicap prize by Leon W. Campbell, captain of the local team. The few other honors that were handed out were allowed to go to entrants from other clubs.

Self-satisfaction is a treacherous chair with three cracked legs.

THE ALDEHYDE CONTENT OF SULPHITE ALCOHOL.

By Dr. Rudolf Sieber, Kramfors.
Svensk Pappers-Tidning, September 15, 1920.
(Translated for the Pulp and Paper Magazine by Dr. Paul Bartholow.)

Neuberg's researches on the fermentation of sugar in the presence of salts of sulphurous acid have many points of interest for the sulphite manufacturer. For instance he shows that fermentation takes place according to a scheme which in its simplest form may be expressed by the equations —

(1) $C_6H_{12}O_6 = 2C_2H_5OH + 2CO_2$

(2) $C_6H_{12}O_6 = CO_2 + CH_3CHO + C_4H_8O$

The first equation gives the course of sugar fermentation in a weak acid solution, consequently under conditions which generally occur in the production of alcohol. The causes of this fermentation in the presence of sulphite compounds are set forth by Neuberg as follows: From grape sugar — besides some intermediate products not isolated hitherto — an acid, CH_3 CO COOH is formed, which breaks up into carbon dioxide and acetaldehyde. The latter is finally reduced to alcohol, and glycerin is formed. Both products occur in normal sugar fermentation, but in smaller proportion than in the presence of sulphite. These theoretical considerations are of practical interest for the manufacturer of sulphite alcohol, for its high proportion of aldehyde, as given by Hagglund, may be explained by the quantity of sulphite compounds in the waste liquor. The formation of aldehyde during the fermentation of sulphite liquor furnishes a basis of testing in the mills. For this purpose the lye was neutralized and the sulphurous acid determined; after fermentation it was tested for alcohol and aldehyde. The results with liquor from the mill were tabulated thus:—

	SO_2 g/100 c.c. of lye*	alkali contents g/1000 c.c.	aldehyde g/1000 c.c.	ald. ——×100 alc.
1	0.17	8.71	0.129	1.48
2	0.18	7.65	0.126	1.65
3	0.20	8.05	0.165	2.05
4	0.21	8.31	0.182	2.19
5	0.23	7.18	0.184	2.56
6	0.26	7.69	0.192	2.51
7	0.29	7.30	0.197	2.70
8	0.30	8.10	0.208	2.57

* The acidity throughout was .04-.05n, with phenolphthalein.

These figures are of doubtful stability. Laboratory tests were, therefore, undertaken. The determination of acetaldehyde is not easy. The hydroxylamine method of Brochet and Cambier proved best adapted for purposes of comparison. Values with the hydroxylamine method are fairly constant at about 9-10 per cent under the correct numbers (Pure aldehyde in dilute solutions of hydroxylamine hydrochloride gave values equal to 91.2 per cent of the actual values). The results of this method are recorded in the following table.

	SO_2 g/100 c.c. of lye before fermentation	SO_2 g/100 c.c. after fermentation	alcohol g.-1000 c.c. of wort	aldehyde g.-1000 c.c. of wort	ald. ——×100 alc.
1	0.132	....	7.61	0.044	0.58
2	0.138	....	7.69	0.043	0.56
3	0.142	0.146	7.20	0.040	0.55
4	0.150	....	6.78	0.045	0.66
5	0.171	0.165	8.62	0.062	0.72
6	0.184	0.178	6.84	0.058	0.85
7	0.195	....	6.75	0.059	0.87
8	0.220	....	8.55	0.124	1.45
9	0.225	0.235	7.25	0.122	1.68
10	0.229	0.227	8.80	0.121	1.38
11	0.230	....	7.80	0.136	1.75
12	0.236	0.227	7.00	0.129	1.85
13	0.248	0.246	8.22	0.148	1.80
14	0.250	0.255	8.40	0.178	2.10
15	0.250	0.252	7.49	0.149	1.99
16	0.256	....	6.92	0.139	2.00
17	0.256	0.250	6.89	0.139	2.02
18	0.286	....	6.81	0.191	2.88
19	0.288	0.290	7.60	0.189	2.50
20	0.294	0.292	8.32	0.196	2.36
21	0.300	....	6.69	0.200	3.00
22	0.330	....	6.82	0.220	3.23
23*	0.412	....	6.82	0.285	4.19

* With Calcium Sulphite sludge.

Note: The acidity was .04-.05n throughout.

In practice, it is found that lyes which contain a small proportion of SO_2, whether inorganic or organic compounds, yield less aldehyde than lyes rich in SO_2. Lyes which come from mills making bleached pulp are of better constitution than those from the production of strong pulp. Thus, in general, the quantities of aldehyde in the liquor depend upon the quality of the pulp, and, naturally also, on the method of cooking — directly or indirectly. It is therefore suggested that the difference might be modified by neutralizing the liquor with lime, and introducing air, by this means oxidizing the sulphite into sulphate. In effect, after a trial of this process, oxidation with air had an inconsiderable result. It would hardly be profitable in practice, owing to the presence of organic compounds of SO_2 which are only slowly oxidized by the oxygen of the air. These organic compounds seem generally to increase the quantity of aldehyde.

Liquor from the manufacture of strong sulphite pulp contains about 0.23-0.28 per cent of SO_2, of which a large part is present as an organic compound after neutralization. In the case of bleached pulp the proportion of SO_2 in the neutralized liquor falls to 0.12 per cent. The quantity of inorganic compounds is also less. It is established that lyes from the bleached pulp digesters require much less lime than those for strong pulp. It is clear, therefore, that mills which produce bleached pulp operate under the best conditions, at least in this respect.

It is not without interest to record the analytical results of the Ethyl company from the investigation of samples of alcohol from various sources. The following mills had the smallest quantities of aldehyde in the alcohol.

1. Skoghall .. .. 0.07 g. per 100 cc. of alcohol
2. Skutskar .. .. 0.12 g. " "
3. Edsvalla .. .. 0.15 g. " "
4. Stromsbruk .. 0.20 g. " "
5. Vallvik .. .. 0.25 g. " "
6. Gota .. .. .. 0.40 g. " "

It does not seem to be a mere accident that the first mills, except Skutskar, make bleached pulp, and

(Continued on page 728).

UNITED STATES NOTES

Striking employees of paper mills in the United States and Canada have voted to accept the proposal made by manufacturers to submit to arbitration the wage dispute that caused some mills to shut down May 1 and others May 11. The arbitration plan calls for the selection of a board of seven, three to represent employees, three employers and a seventh, chosen as umpire by both sides. The board's finding will be retroactive. The ballot of the unions showed the men to be almost unanimous in favoring arbitration as a means of settling the strike. The International Paper Company is not a party to the arbitration agreement. Eleven other concerns are. The manufacturers selected C. H. L. Jones, of Sault Ste. Marie, Ontario; E. B. Murray, vice-president of the Union Bag and Paper Company, New York, and Floyd S. Carlisle, president of the St. Regis Paper Company, to represent them. The employees selected as their representatives, John P. Burke, president of the International Pulp, Sulphite and Paper Mill Workers, Jeremiah T. Carey, president of the International Brotherhood of Papermakers, and J. T. Foster, of the Dominion Trades and Labor Conference. Frank Irvine, of Ithaca, a former member of the Public Service Commission, New York State, and at one time dean of the Law School of Columbia University, was named as impartial chairman of the arbitration board. The arbitration committee this week begins a tour of the paper mill centers of Canada and the United States. First hand data concerning the working and living conditions of the workers will be obtained. This data, together with the demands made by the men in various localities, will form a basis upon which arbitration will be begun.

In an effort to protect the cyclone swept area of the Olympic Peninsula in the State of Washington from fire, Secretary of Agriculture Wallace has issued an order, effective July 1, prohibiting smoking within the area during the fire danger season. Aerial air patrols also will be maintained. Nearly seven billion feet of timber blown down by the terrific storm last January 29 is contained in the half million acre area swept by the storm.

The Peerless Paper Company, North Dayton, Ohio, sustained a loss estimated at $35,000 through a fire last week that destroyed saw materials and furnished stock in its store rooms. None of the machinery was damaged. Most of the loss was covered by insurance.

At a dinner meeting held recently at Portland, Maine, the Cost Association of the Paper Industry organized an Eastern local division. An organization committee was formed, the members of which agreed to make arrangements for holding the next meeting at Augusta, Me., on September 14. The members of this Committee include A. D. Pomeroy, Eastern Manufacturing Co., chairman; J. E. Hyde, S. D. Warren Co.; H. E. Blackman, Pejepscot Paper Company; G. L. Smith, Rogers Fibre Co.; J. E. Whitman, S. D. Warren Co.; L. J. Catheron, Eastern Mfg. Co.

Robert J. Cullen, a pulp and paper engineer widely known to the industry in the South and East, is at the head of the recently organized Nashville Pulp and Paper Mills which, he announces, will shortly begin operations at Nashville, engaging in the manufacture of a wide variety of paper products. 500 people will be employed at the start. The initial operation according to Mr. Cullen, will produce 75 tons per day of chemical wood pulp, employing the sulphate process. The mill property contracted for involves a large tract of land and five of the enormous buildings formerly used in cotton purification and drying processes. There will be constructed in addition, a large boiler plant, liquor recovery plant, causticizing units, wood preparation rooms and a number of storehouses. This will involve an outlay of approximately $500,000.

The recently formed Valley Paper Mills has selected a site for its plant at Neenah, Wis. It is announced that construction work will be started in the near future. The capital stock of the company is $1,500,000. Its product will consist of glassine, grease-proof, onion-skin, manifold, colored and embossed papers.

FLOOD PREVENTION REQUIRES FORESTS.

New York, June 27.—The work of the Pittsburg Flood Commission for forestry in Pennsylvania has been recognized by the naming of that Commission, as represented by Maj. W. M. Jacoby of Pittsburg, on the National Forestry Program Committee, on which such important national groups as the American Newspaper Publishers Association, the American Forestry Association, the American Paper and Pulp Association, and the National Lumber Manufacturers Association are represented.

The Pittsburg Flood Commission has been working for the establishment of forest areas on the headquarters of the river which meet at Pittsburg, as the most important step in the prevention of the devastating floods which sweep the Ohio valley.

Maj. Jacoby's first cooperation with the National Forestry Program Committee was when he appeared before a Congressional committee early in January, and aided in securing increased appropriations for national forestry development. Later the Pittsburg Flood Commission and the Pittsburg Chamber of Commerce endorsed the Snell forestry bill, which was sponsored by the Committee on which Maj. Jacoby has been made a member.

The program of state forestry legislation by the forestry committee of the American Paper and Pulp Association as a basis for state cooperation with federal forestry officials in all its essentials the same as the Pennsylvania State forestry policy, and was the basis of three new forestry laws passed by the Ohio legislature, in which passage the National Forestry Program Committee assisted.

Archibald Alcorn and Fred. A. Hews, of Blackville, and Wendell P. Jones, of Woodstock, N.B., have incorporated as A. Alcorn, Limited, with an authorized capitalization of $2,000,000, head office Blackville, to take over as a going concern the business of Archibald Alcorn at Blackville, as lumber and pulpwood dealers and operators.

PULP AND PAPER NEWS

The printers' strike in Toronto still drags on. Last week, a communication was addressed to each member of the Toronto Typothetae (the employers' organization) by Mr. Edward Randall, chairman of the Managing Committee of the National Pressmen's Union, local No. 10, and of the National Press Assistants' Union, local No. 1. Mr. Randall addressed this communication to the individual members of the Typothetae in the belief that many members of that organization were not aware of the length to which those for whom he speaks were prepared to go, in order that (as he expresses it) "all might continue harmoniously in our trade in Toronto." From this communication it would appear that the pressmen and assistants were prepared to return to work on a forty-eight hour basis. But certain other of the features contained in their proposition, as now appears from an Open Letter over the signature of the Typothetae, published last Saturday, did not commend themselves to that organization's Committee which submitted a counter-proposition as its final offer. The negotiations over this counter-proposition seems to have broken down on the question of the "fair shop" and "no discrimination." For, in its Open Letter, the Toronto Typothetae state: "A question was addressed to Mr. Randall in effect as follows: If ten men had left a shop on strike and five of their positions had already been satisfactorily filled, would you expect the shop to take back all ten strikers? Mr. Randall's reply was: 'I would think so, or none.' This reply in itself shows that, while your (the Pressmen's) Committee had accepted the principle of no discrimination, they did not intend to abide by it." As mentioned, it seems to be over this rock that the negotiations split. In view of promises contained in their advertisement for help, as well as of their repeated pledges of "open shop for the future," it is difficult to see how the employing printer could come to any agreement whereby, in order to make room for those now on strike, they should undertake to get rid of men who have done so much to help them out in their present difficulties. But the recent publicity given to the overtures made on the pressmen's behalf seems to have convinced the general public that the latter are very anxious to get back again. The bookbinders are already back at work—such of them as can get it. Should the pressmen and employers come to terms—and, if so, it looks as though they would be the latter's terms—that would still leave the printers obdurate. And, no doubt, they would prove a rather hard nut to crack. At the same time, there would be no "unbroken front" presented by the three branches of workers. One can well imagine that it has been far from an agreeable surprise to the strikers that the employers have contrived to "carry on" as well as they have unquestionably done hitherto.

The new tariff bill in the United States contains provisions with relation to print paper, wood pulp and wood for manufacture of wood pulp, which are causing some disquiet to newspaper publishers in the United States. The bill provides for a duty on print paper, (not newsprint) of ¼ cent per lb., ten per cent. ad valorem. To this is appended a provision that is (apparently) aimed at restrictions on the export of pulp wood parts of Canada. If any country, or sub-division thereof, imposes, directly or indirectly, export charges or restrictions on print paper, wood pulp or wood for manufacture of wood pulp, the President is empowered to enter into negotiations for removal of such restrictions or charges. If these are not removed, and until they are removed, the bill makes it mandatory that there be imposed and added to the regular duty the following: "An additional duty of ten per cent, ad valorem, and, in addition thereto, an amount equal to the highest duty or other export charge imposed by such county, dependency, province or other sub-division of government, upon either an equal amount of printing paper, or an amount of wood pulp, or wood for use in the manufacture of wood pulp, necessary to manufacture such printing paper." The effect of this would really be to impose three sets of duties on exportations of print paper, wood pulp, or wood for making pulp, in case of restrictions or export charges in Canada.

The International Paper Company, last Friday, notified its striking employees that it would reopen all its plants on Tuesday of this week and extend to them "the privilege of coming back to work on the proposition of the 24th May, which means that our employees will receive approximately ninety-five per cent. more wages than they did in 1914." The Company's statement proceeds: "If a sufficient number of our former employees accept this proposition to operate the plants, we will start them up as near full capacity as our business will permit. If you do not accept this proposition on Tuesday, 5th July, the Company will arrange to start such of its plants as it desires to have in operation to take care of the requirements of its customers." A strike was called at this Company's and other paper mills on the 1st May. The International Company has declined to reach an agreement on the same terms as that arrived at by the other mills and their striking employees whereby an arbitration board of seven was appointed to settle questions in dispute, the employees meanwhile to receive the wages they were getting when they walked out.

A former Torontonian, Mr. Walter S. Dickey, has acquired the control of the Kansas City Journal, one of the oldest and best established papers in the Prairie States. Mr. Dickey is also head of the Dickey Clay, Products Company, and prior to embarking in business in the United States, he was engaged in commercial work in Toronto, being, at one time, connected with the Eby, Blain Company.

The Ross Can Company, of Bowmanville, Ont., manufacturers of fibre containers, has installed a good deal of new equipment lately, and intends to embark on a new line of sanitary containers for canneries, for which a large demand is reported.

A large groundwood mill—one of fifty tons capacity—is likely to be erected shortly at Haileybury, Ont. It is believed that some prominent Toronto men are among those behind the proposition.

Technical Section

REVIEW OF RECENT LITERATURE.

A-11; K-9. Wilkinite, a New Loading Material. SYDNEY D. WELLS, **Paper,** xxvii, 14 (Dec. 8, 1920). "Wilkinite" is the name given to a highly colloidal clay which occurs in certain parts of the intermountain regions of the United States in beds between layers of marine shales. Comparative physical tests were made on wilkinite and on the English china clay used at the Forest Products Laboratory, Madison, Wis., under the same conditions and by the same chemist. These showed that while wilkinite contains more coarse material than the English china clay, the latter contains very much more material of medium coarseness and less "clay". Wilkinite suspensions as low as 4 lb. per 100 will remain in complete suspension through long periods and they have the power to hold in suspension English china clay in amounts up to at least twice the amount of wilkinite present. The viscosities of the Wilkinite-English china clay suspensions are practically the same as with wilkinite alone and in amounts up to 3lb of wilkinite per 100lb of water are not sufficiently great to interfere seriously with pumping. Semi-commercial paper trials were made using china clay, wilkinite, and mixtures of china clay and wilkinite. The use of wilkinite caused a great increase in retention, which was a result probably of the highly colloidal nature of the wilkinite which served to hold the English china clay in suspension as it ran on to the wire, and, as the sheet formed, the loading was more evenly distributed. The slowing effect of the wilkinite was very evident, and the wire mark was diminished on account of the better distribution of the loading material. The color of the sheet when a mixture of clay and wilkinite was used was not noticeably affected; but when wilkinite alone was used the color was noticeably duller; this might prove objectionable in papers where a high degree of whiteness is required, but for the majority of book and magazine papers this could easily be corrected. Commercial runs were also made, and the following indications were given by these tests: (1) Wilkinite used in amounts up to 30 percent of the total loading material, the remainder being English china clay, yields a paper with superior appearance, finish, and feel; (2) wilkinite used in amounts indicated above does not affect the color of white paper more than can be corrected with small amounts of blue coloring agents; (3) in the runs using wilkinite with English china clay, the greater the proportion of wilkinite, the greater retention; (4) wilkinite causes a slowing of the stock on the wire with obvious benefit to the formation and distribution of the loading material and reduction of the wire marks. —A. P.-C.

A-13. Testing Dyes for Colored Papers. B. K. STEADMAN. **Paper,** xxvii, 16 (Dec. 22, 1920). The following procedure is said to give satisfactory comparative results when elaborate equipment for testing dyes is not available, if proper precautions are taken in carrying out the test. Equal weights of the sample to be tested and of a standard color to which it is to be compared are dissolved in equal amounts of water. A laboratory sample of stock is prepared containing the same relative proportions of the various stocks as the paper being made. This is shaken in a fruit jar containing some water and small pebbles or shot, and then transferred to a big bowl with a definite amount of water. The color, size, filler, etc., are added in the same proportions and in the same order as on a mill run and all are then well mixed with an egg beater or something similar. Some of the pulp is poured on to the edge of the fourdrinier wire and covered with a piece of dry soda pulp (smooth side down) and run through the couch rolls, then through the first press rolls. It is dried by hand on one of the driers and is finally calendered.—A. P.-C.

A-15. The Constitution of Cellulose. KURT HESS **Z. Electrochem.,** xxvi, 232-51 (1920); **Paper,** xxvii, 13 (Dec. 1, 1920); 14 (Dec. 3, 1920); 15 (Dec. 15, 1920). Translation by Clarence Jay West.—A. P.-C.

B-7. Cost in Wood Operations from the Manager's Point of View. D. A. CROCKER, **Paper,** xxvii, 16 (Dec. 22, 1920). The essential information for the manager of the woods operations is the current cost of his operation. The nature of the current information which he should have, the method of calculating the costs, the increased cost of labor of arriving at the costs, and some of the advantages of a good accounting system, are described.—A. P.-C.

B-9. Snell Forestry Bill before U. S. Congress. Paper, xxvii, 17 (Dec. 29, 1920). Text of the address of Chief Forester Col. W. B. GREELEY before the meeting of the State forestry officials at Harrisburg, Pa., Dec. 8, 1920, discussing the part of the federal government and of the State governments in the forest policy; the part of the former should be readiness to give financial assistance to any State for fire protection and reforestation when the State effected the proper regulatory steps. The text of the Snell forestry bill is given.—A. P.-C.

C-5. Spraying Wood for Fire Prevention as Preservation. E. SUTERMEISTER. **Paper,** xxvii, 16 (Dec. 22, 1920). Results of a series of experiments testing out the spray system of wood protection devised by F. J. HOXIE. (1) The wood from the top of the pile where it is exposed to the sun and wind contains less moisture as the size of the logs decreases, but when moistened by spraying the smaller sticks become saturated with moisture sooner than the larger ones. (2) The wood in the lower part of the pile is considerably more moist than that in the middle of the upper sections, and there is a very sharp change in moisture content within a comparatively few feet of the ground, sticks lying directly on the ground being very much wetter than those four or even two feet up. (3) Wherever the logs are subjected to the spray continuously they become quite uniformly wet with 52 to 60 percent moisture, but where the spray strikes them only part of the time, according to the direction of the wind, they take up considerably less moisture. (4) In no case was there any drying out of the very wet logs while they were under the influence of the spray, indicating that the amount of water delivered was more than was necessary to replace normal evaporation. Superficially it was slimy, very black, and in many places covered with a network of white mold; but a closer inspection of the logs and of the chips

prepared from them proved the greater part of the wood was sound. The observations covered only a comparatively short period; but the writer has confidence in the system for the prevention of both fire and decay.—A. P.-C.

E-1. Analysis of Sulphur Burner Gases and Sulphite Acid. A SANDER, Darmstadt. **Paper,** xxvii, 14 (Dec. 8, 1920); 17 (Dec. 29, 1920). Critical review of Reich's, Adolf Frank's, Lunge's and Sander's methods of analyzing sulphur burner gases, and of Winkler's Hohn's, Oman's, Hagglund's, Streeb's, Goldberg's, and Sander's (iodate method, and mercuric chloride method) methods of analyzing sulphite "acid", with special emphasis on the advantages and accuracy of Sander's method, both for the gas and for the liquor analyses.—A. P.-C.

E-4. Acid Reclaiming in Sulphite Cooking. O. L. BERGER. **Paper,** xxvii, 16 (Dec. 22, 1920). Brief review of the various methods of recovering the gas and liquor relieved during cooking in the sulphite process of pulp manufacture.—A. P.-C.

E-5. New Reagents for Cellulose. CLARENCE JAY WEST. **Paper,** xxvii, 19 (Jan. 12, 1921). According to a recent German patent (Willhelm Schlosser, Ger. patent No. 328,729) wood and similar cellulose-containing materials upon being treated with primary and secondary aliphatic and aromatic amines, either as such or in solution in alcohol, benzene, and similar solvents, are decomposed so that the cellulose remains undissolved. Richard Schwartzkopf has patented (Ger. patent No. 328,730) the use of acid chlorides sulphuryl chloride, phosphorus oxychloride, thionyl chloride, acetyl chloride, benzoyl chloride, etc.) alone, or in solution in an indifferent solvent (benzene, carbon tetrachloride, etc.) for the preparation of cellulose from wood and similar raw materials. This is not as satisfactory as the use of aromatic amines, for in most cases a supplementary treatment with caustic soda is necessary to obtain a pure cellulose.—A. P.-C.

E-0. Sulphite Cellusose. A. KLEIN. **Woch. Papierfabr.,** xli, 41 (1920); **Paper,** xxvii, 16 (Dec. 22, 1920); 17 (Dec. 29, 1920. A review of the various formulas proposed for cellulose, of the reactions which probably occur in the sulphite digester (cleavage of the lignin and its transformation into soluble compounds by esterification, condensation of bisulphite with aldehyde or ketone groupings, addition of bisulphite to a double bond, sulphonation), influence of the kind of wood, time of cutting, habitat, and method of cooking on the yield and on the chemical and mechanical properties of the pulp obtained.—A. P.-C.

K-1; R-13. Scientific Control in the Paper Mill. E. G. MILHAM, Bryant Paper Company. **Paper** xxvii, 13 (Dec. 1, 1920). Hints on the scientific control of raw materials (pulp, chemicals, colors, size, twine, felts wire, belting) and the processes of manufacture in the paper mill.—A. P.-C.

K-7. Characteristics of the Niagara Beater. W. H. BURNS. **Paper,** xxvii, 19 (Jan. 12, 1921). The main characteristics of the Niagara beater are: high backfall and sloping bottom, hollow midfeather allowing the rear bearing of the roll shaft to be placed inside, restricted opening back of the roll between the backfall and the rear hood, close running doctor which is carried 3/8 in. from the roll, bandless roll, quick emptying dump valve which is controlled by a lever located in the floor outside the tub.—A. P.-C.

K-10. Zellkoll-amal Sizing. SIGISMUND FERENCZI, editor of **Papier-Zeitung. Paper,** xxvii, 18 (Jan. 5, 1921). In the "Zellkoll-amal" process the principal feature is that animal glue is added to the pulp in the engine not in solution but as a jelly. This is disintegrated in the engine to fine particles in a semi-solid state,which cover the fibres and melt only when the paper web has been heated on the driers to a certain extent. The fibers are thus pasted together to a uniform body and the paper is sized throughout. The glue is made up into a jelly by hardening (generally with formalhyde or aluminum formate) either in the beater or before adding to the pulp. A much greater proportion of the loading material is retained in paper sized with zellkoll-amal than in paper sized otherwise.—A. P.-C.

K-11. Sectionalized Motor Drive for Paper Machine. Paper, xxvii, 16 (Dec. 22, 1920). Description of the sectionalized motor drive for paper machines recently installed by the General Electric Company at the will of the Crown-Willamette Paper Company, at West Lynn, Oregon.—A. P.-C.

K-0. A New Standard for Mixed Paper. THOMAS HEBERLY. **Paper,** xxvii, 15 (Dec. 15, 1920). A brief description of the difficulties which the user of mixed waste papers has to overcome in the preparation of his stock owing to the very poor assorting of such grades. —A. P.-C.

K-0. Equipment for Practical Papermaking. JOHN J. SULLIVAN. **Paper,** xxvii, 15 (Dec. 15, 1920). A discussion of the importance of proper maintenance of the equipment of paper mills to obtain proper yield and quality, including sulphite equipment, rag room equipment, washers, beater equipment manipulation and care, paper machines and their equipment (screens, flow box, table rolls, felts, driers and calenders). — A. P.-C.

M-7. Automatic Control of Temperature and Humidity. Paper, xxvii, 19 (Jan. 12, 1921). At the Forest Products Laboratory, Madison, Wis., a device has been developed for maintaining the temperature and humidity constant in certain rooms and has been in continual operation and has given satisfaction for several years. The principle on which the apparatus works is that of cooling the air to the dew point temperature for the desired atmospheric conditions, saturating it with moisture at that point, and then heating it without addition of moisture to the desired room temperature. For any given room temperature it is possible to get any humidity desired simply by choosing the temperature at which the air is saturated. Drawings of the apparatus and further details concerning its installation and operation may be had on application to the Forest Products Laboratory.—A. P.-C.

Q-0. Paper Cores for Cement Pilings. DELPHIA PHILLIPS. **Paper,** xxvii, 16 (Dec. 22, 1920). Brief description of a method recently devised for building hollow cores of papers which are used as a foundation for building up cement piles 18 to 20 ins. in diameter. —A. P.-C.

R-1. Argentina's Pulp Resources. Paper, xxvii, 18 (Jan. 12, 1921). A mill is being constructed by Barranquoras, in the Chace territory on the Parana river, which will use a species of bog grass called **paja brava.** —A. P.-C.

R-2 Classification of U. S. Patents. Paper, xxvii, 19, 19-20 (Jan. 12, 1921). Classification of the two main divisions of U. S. patents of interest to pulp and paper manufacture, **92 Papermaking and Fiber Liberation,** and **93 Paper Manufactures.**—A. P.-C.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 2nd July.—In practically all lines of paper, business remains quiet, and, in fact, almost stationary. Normally, the months of June, July and August are dull months in the paper trade, but the present is a time of quite phenomenal slackness. "We have just go tto worry through," said the representative of one of the large manufacturing houses to the writer today: "Things will right themselves some time, but we have not got to the end of the slack period yet—not by a long way. In addition to the dullness which we normally expect in the paper trade at this season of the year, there are a whole lot of other factors in evidence at present which all tend to accentuate dejected and depressed conditions. For one thing, there is the general trade lassitude which is affecting our own, in common with nearly every other branch of industry. Among other ill effects, this has meant a tremendous falling-off in the total volume of advertising, which, of course, has directly, and very detrimentally, affected certain departments of our industry. Then the printer's strike has still further accentuated the depression we are experiencing. Altogether, there is little prospect of any genuine and substantial improvement in the near future." On practically all sides, this is the tale one hears—a tale that becomes monotonous alike in the telling and in the hearing. The net result is, naturally, that, in almost all lines, prices remain practically stationary. In no line is there any price reduction of any importance to report. For the plain fact of the matter is this—and it is an aspect of the case as to which both manufacturers and jobbers are in agreement—that any conceivable reduction in prices would have no effect in stimulating further buying beyond the occasional and spasmodic purchasing which is already taking place. To such a pitch of diminished vitality has the paper market attained. With regard to the printer's strike, the prospects of settlement by agreement seems more remote than ever. At the same time, present indications are that the strike will "peter out" of itself, in time. One of the employers with whom the writer recently had a talk described the situation as "getting better every day" from their point of view. No doubt the strike is causing the employing printers a very considerable amount of annoyance and inconvenience. But, somehow or other, they are managing to get out the work that is immediately necessary. Moreover, the sympathy of business men with the employers at this juncture is so pronounced that they are ready to make large allowances for delayed work and even for defective workmanship, so long as the employers hold out. The employing printer quoted above amplified his statement that the situation, from the employers' standpoint is "getting better every day" as follows: "Every day that passes it becomes more evident that trade revival can only take place if, and as, production costs are lowered. Thus the folly of expecting shorter working hours without diminished wages every day becomes more apparent, as this must inevitably mean a heightening of production costs—that is to say, if the forty-eight hour week that a man has been doing has been an honest forty-eight hour week—one up to the limit of his capacity—then a forty-four hour week at the same wages cannot fail to mean an increase in production costs. It means, too, an increase in production costs at a moment when, owing to a falling market, the trade cannot stand it. Further, every day that passes sees the cost of living decreasing—here a little, and there a little. Thus, the longer the strike lasts, the less justification will there be for a demand for increased wages—for that is what the men's claims, in the last analysis, amount to." In the present dull and depressed state of the paper market in nearly all lines there is little use in going through the various lines *seriatim* this week, as the statements that prices remain unaltered and that business is light and uncertain apply to practically all lines. An exception is to be found in the case of toilets and tissues, the business in which continues to be pretty good. There is a fair amount of business in the rag and paper stock market, with roofing rags continuing in some demand. There is some business doing in box board as boxmakers are showing a tendency to absorb somewhat larger supplies. Wrapping papers, too, are exhibiting some movement. But, even in those lines in which there is least inactivity, business all round is much too light.

NEW YORK MARKETS.

New York, July 2—(Special Correspondence)—Some branches of the paper market are evincing moderate activity. This applies particularly to the tissue paper, newsprint and box board divisions of the trade, these grades being sought by buyers in fairly large volume in comparison with other kinds of paper. The market in its entirety in the States is in far from normal condition. Consumers in common are still confining their purchasing operations to supplies actually and directly needed, and few if any of them are considering forward requirements when placing orders with jobbers or mills. There is a distinct tendency to limit buying to immediate wants, with the obvious result that aggregate demand involves far less than usual amounts of paper for the reason that consuming industries are experiencing quietness and therefore are not at present in need of customary amounts of paper.

At the same time, as stated above, newsprint, tissue papers and boards are moving in relatively good volume, and indications point to a gradual, though steady, improvement in business in these lines. Fine tissues are sought in larger quantity than for some time, and coarse tissues are probably the most active item in the market, there being a very good call for towels, napkins and toilet papers. Prices on these are steady to firm, with No. 1 white tissue quoted at around 95 cents per ream by mills.

The box board situation is characterized by comparatively broad activity. The average box manufacturer in New York and in other large centres is working at no more than 60 to 70 per cent of capacity, but the fact remains that they are busier than in recent months and that they are absorbing proportionately larger tonnages of board than in some time. Board mills are far

75 cents. Old repacked thirds and blues have sold down to 1.65 cents a pound, and No. 1 old miscellaneous whites at 4 cents. New cuttings are obtainable at almost any prices within reason in some quarters, though a proportion of dealers are holding out for better prices.

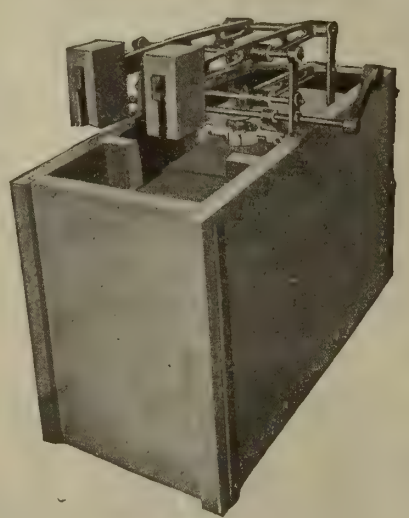
PAPER STOCK.—There is a fair call for certain grades of old paper. Old kraft continues to lead in demand and is readily fetching 2 to 2.15 cents per pound New York for No. 1 packing, while No. 1 mixed paper is moving in comparatively good volume though 30 cents f.o.b. shipping points remains the mill buying basis. White news cuttings hold steady at around 1.60 cents a pound, and there is some movement of flat stock at around 90 cents a hundred for books and magazines. Soft white shavings are in moderate demand and dealers are insisting on at least 2.25 cents New York, with a majority asking nearer to 2.50 cents. Hard white shavings are quiet and can be purchased by mills at 3 cents for No. 1 grade, while folded newspapers are little wanted and are freely offered by packers at 37½ cents a hundred at shipping points.

OLD ROPE AND BAGGING.—Old Manila rope holds steady in price at an average of 4 cents per pound New York, and consumers appear to be absorbing fair-sized amounts. Bagging continues dull and is nominal in value.

WATEROUS MAKING FEENEY REGULATOR.

One of the most important operations in the manufacture of uniform paper is the proper regulation of the stock on to the machine. To accomplish this the Improved Feeney Stock Regulator has been placed on the market and is being manufactured in Canada by the Waterous Engine Works Co., Limited.

This Regulator, it is claimed, will keep the weight of the stock within 1 per cent at all times and can be installed in less than three hours without changing the existing line of piping.



The stock from the tanks enter a large compartment, the top of which is a large float connected directly with an overflow gate.

The gate through which the stock passes to the machine, is adjusted in such a way as to allow the current amount of stock to pass through.

Should the pressure in the tank increase above a certain pressure the float is raised and this automatically opens an overflow gate, at the same time partially closing the gate to the machine.

That this machine is well past the experimental stage is evidenced by the fact that there are over 600 now in use in the United States, many of these representing repeat orders.

FINANCIAL FIRM ADDS PAPER DEPARTMENTS.

The Investment House of H. L. Coombs Co., announces that they have added three new departments to their business, namely: Pulp and Paper Machinery Equipment, Pulp and Paper Products and also an Engineering and Contracting Department.

A special effort is now being made by several Canadian Manufacturers to supply Pulp and Paper Mills with Canadian made machinery, as it is felt that the more business that is placed with Canadian firms, the better it will be for business generally and for the employment of skilled labour.

John C. Corcoran, formerly of the Dominion Engineering Company, will be in charge of this department. Mr. Corcoran has had some thirty years experience in this line. His Assistant Mr. P. E. Buss, formerly of the Provincial Paper Mills knows the business and trade thoroughly.

The magnitude of the Pulp and Paper business in this country is growing by leaps and bounds, and to secure a part of the foreign business that is offered, this firm has secured the services of Robert Rolland, lately connected with the Export Department of Messrs. Grace & Company. Agency connections are being established in India, China, South America, Australia and Europe, and in addition to looking after this Foreign demand, the domestic business will be taken care of in all lines of Pulp and Paper Products.

Another department the Company intends making a specialty of is engineering and contracting.

Mr. L. N. Jenssen, who has had an experience in several parts of the world in Railroad Construction, Bridge Building and Concrete Work, will be in charge.

Mr. Jenssen is of the opinion that this is an age of Concrete, and that Bridges and other Constructions made of this material are much more serviceable and inexpensive than with any other material.

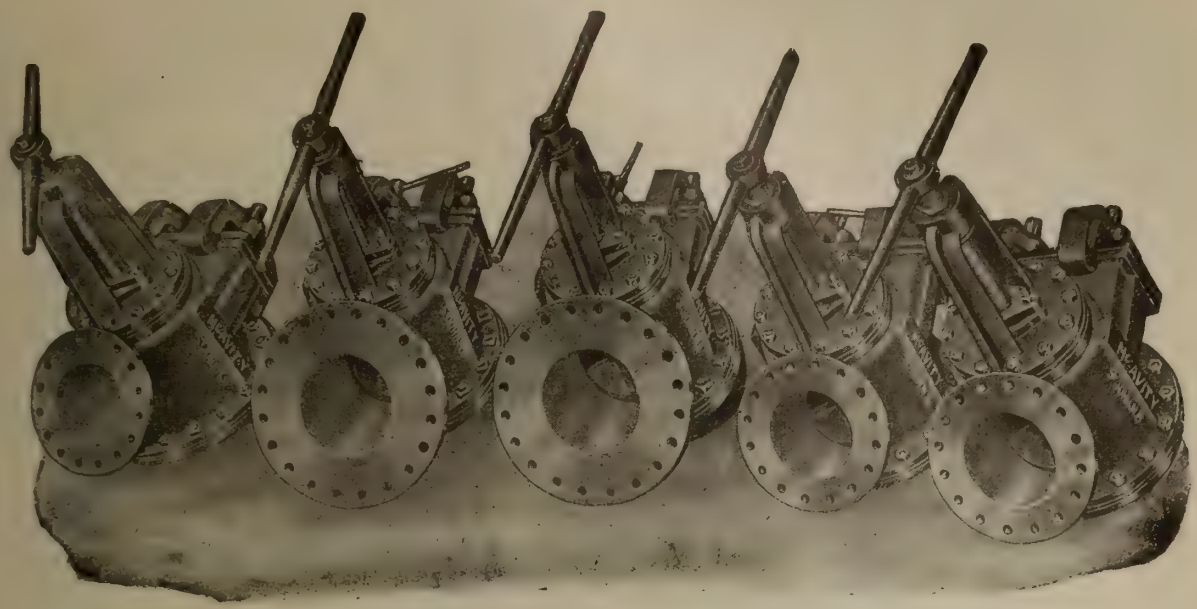
ALDEHYDE CONTENT OF ALCOHOL.

(Continued from page 719).

that Gota produces strong pulp. In Kramfors, where large quantitiees of strong pulp are made, the aldehyde content in the alcohol varies between 0.4 and 0.5 g. per 100 cc. In the manufacture of soft pulp about 0.36 g. is obtained. A considerable portion of aldehyde goes over in the first fractions, which may contain 3 to 3.8 per cent of aldehyde; these first fractions account for about 12 per cent of the total spirit. A portion of the aldehyde, about one-third, is lost in distillation.

The new power house at Twin Falls is now supplying current to the mills of the Abitibi Company at Iroquois Falls, Ont. Two of the four generators are running and produce 12,000 H.P. The first work for the new power is to run the three new paper machines, two of which are the largest in the world.

The Abitibi "newsprint quartette" turned out an average of 237.1 tons a day for the week ending June 19. This is at the rate of 729 lb. per inch of trimmed wire.



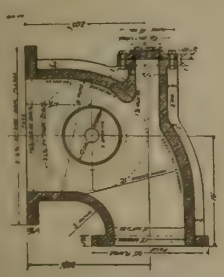
"World" Bronze



Special Elbow.



Digester Sleeve.



Digester Elbow.

Note thickening of Casting at point of wear, giving longer service.

is famed for its long-wearing qualities under the wearing and corrosive action of Sulphuric Acid.

A pattern equipment which is probably the most comprehensive in Canada for the needs of Sulphite Mills in Valves, Fittings and Specials, enables us to quote you rock bottom prices.

So sure are we that "World" Bronze will stand up in service that we are casting in each article the trade mark "World" and the words "Date Installed" with a raised portion beneath where the date may be stamped. Thus we give the engineer in charge of your Mill an absolutely correct record of the life in service of each Valve, Fitting or Special Casting manufactured of "World" Bronze

It Pays to Specify *"WORLD"*

T. McAVITY & SONS Ltd.

MONTREAL
TORONTO

St. John, N.B.
Canada

WINNIPEG
VANCOUVER

from being choked with orders, but it is generally admitted they are receiving numerous calls for board and that the present movement toward boxmaking plants is heavier than at any time thus far this year. Prices on plain chip board are steady at an average of $32.50 a ton f.o.b. mills and on filled news board at around $35. Now and then sales are recorded at slightly less, but manufacturers for the most part are holding out for these figures.

Trading in spot lots of newsprint is fair. This is but to be expected, as with many newsprint mills shut down during the past six to eight weeks because of the strike of operatives, publishers are obliged in frequent instances to look for paper in the open market. There has been no further change of note in newsprint quotations. Spot news in standard rolls is bringing around 5 cents a pound at mills, with the quotations heard ranging a quarter of a cent a pound on either side of this basis. The strike of mill workers appears to be about over. Several more mills have reopened this week, following the reaching of an agreement by manufacturers and strikers to arbitrate the wage question, and it is understood remaining mills will start up again next Monday or Tuesday. The International Paper Company has sent letters to its striking operatives indicating its intention to reopen its mills next Tuesday after the Fourth of July holiday. The men are invited to return on the basis of the company's proposal of May 24, which provides for an average cut in wages of 21 per cent. Other mills affected by the strike have placed the wage matter in the hands of an arbitration committee of seven, three appointed by each side and the seventh member being Judge Frank Irvine, of Ithaca, N.Y., former Public Service Commissioner, and have either resumed operation or plan to do so during the coming week.

The contract basis on newsprint of the International Paper Company, the Canadian Export Paper Company and other leading producers is now 4.75 cents a pound, or $95 per ton, f.o.b. mills, this price becoming effective yesterday as the basis fixed for deliveries over the third quarter of the year.

There is no change of importance in book papers. Demand is running at an even keel at considerable under normal volume, and mills are busying themselves chiefly with supplying contract customers. Wrappings are moving in routine fashion, with buying interest centred on No. 1 kraft, which is quoted at 6.50 to 7 cents per pound at mills. Fine papers are in slack demand. Jobbers are buying only to fill the printing trade. It is understood that a good many paper mills are planning to close down all of next week partly because of the business depression and partly to make repairs and take mid-year inventories.

GROUND WOOD.—Mechanical wood pulp holds fairly steady in price at around $30 per ton at grinding mills for prime spruce ground wood for prompt delivery. Demand is of limited proportions, however, and the market displays no new life worth mentioning, business being purely of routine character. That the strike at print paper and pulp mills has seriously affected ground wood can be seen in the Federal Trade Commission's report on the pulp industry for May, which shows that the production of ground wood in that month dropped to 97,963 net tons from 159,442 tons produced in April. Despite this sharp decline in output, mill stocks of ground wood increased slightly during May, amounting to 226,089 tons at the end of the month, compared with 217,308 tons at the beginning of May.

CHEMICAL PULP.—Consumers of chemical wood pulp are buying at present in slight amounts merely to cover quick requirements. Sales seldom involve other than a few carloads at a time, which buyers want delivered as early as possible, and there is an easy tone to quotations. Notwithstanding the marked decrease in ground wood production in May, there was an increase in chemical pulp output in that month, according to the Federal Trade Commission's report, which places chemical pulp production in May at 118,138 net tons, against 109,364 tons in the preceding month. Moreover mill stocks jumped from 56,984 tons at the outset of the month to 60,127 tons at the end of May.

No notable change in pulp quotations are reported, though most of the current transactions are at the low edge of quoted ranges, indicating that values are weak and that sellers are granting concessions to move stock. Imports through the port of New York this week included 1,000 bales from Hamburg, 1,290 bales from Wallvik.

RAGS.—The papermaking rag market has ruled exceedingly quiet during the past few days. There have been sales, of course, but individual transactions have mostly involved small quantities of rags and the total amount moved has been of negligible volume. Roofing paper manufacturers have noticeably let up in their buying, while writing, blotting and other paper mills have absorbed few sizable lots of stock.

Prices are easy and such fluctuations as have occurred have been in a downward direction. No. 1 roofing is available to mills at 80 to 85 cents per hundred pounds at shipping points and No. 2 roofing at

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., July 14th, 1921. No. 28

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press. Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

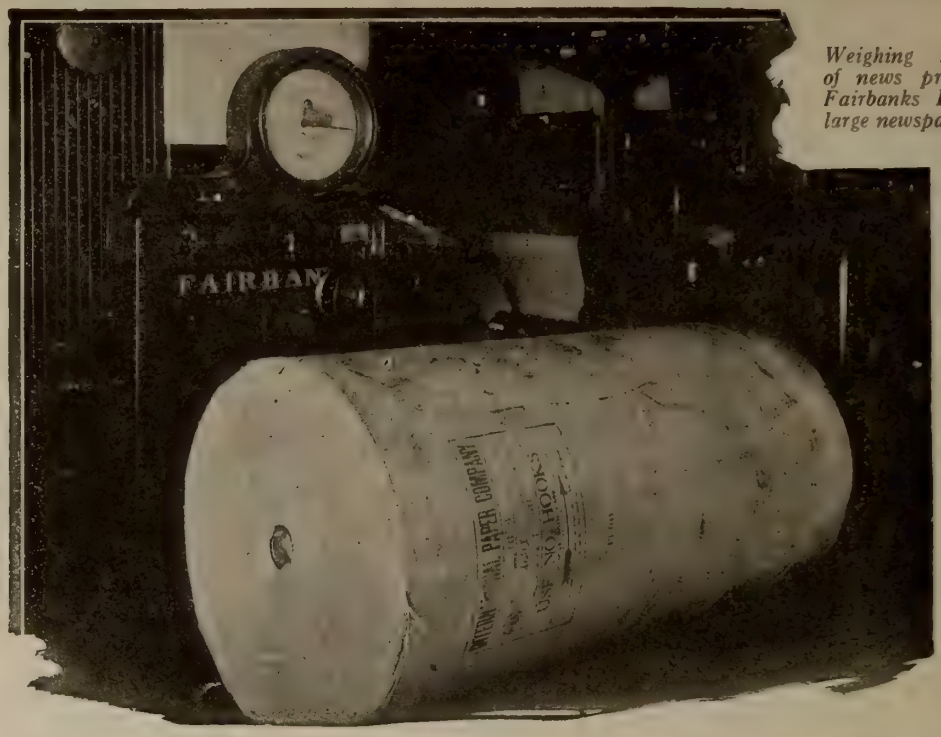
Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

AFTER THE HORSE IS STOLEN.

We have all heard about locking barn doors but most of us are prone to procrastinate until misfortune befalls us. Those who have studied the forestry situation have known right along that such a combination of weather conditions as we have experienced this spring and summer must inevitably result in enormous destruction to the forest. 1921 will be circled in red and bordered in black on the calender of years to many a company and many a family. Great improvements in fire protection have taken place since the last particularly disastrous forest fire but the experience of this summer shows that there remains a great deal to be done before the forest is made safe for the trees. Different districts require various treatment and present individual problems but there are certain fundamental facts that must be recognized and certain features of the problem that must be provided for. To do so requires more courage on the part of our legislators than they have so far exhibited and a better spirit of co-operation on the part of the public than has so far been in evidence. The first is a proper discharge of duties and obligations and the second is largely a matter of education and the administration of the law.

The lesson just written on the page of Canada's history is written in vain unless steps be taken to prevent absolutely a recurrence of such an experience. The variety of possible causes of fires makes the treatment of the subject a bit difficult but when it is positively known that certain precautions will at least do away with this or that possible cause we cannot see why under the sun such remedies are not demanded. In the State of Washington enormous areas suffered from a great wind storm last year and the dead trees that fell formed such a hazard that smoking in that area has been positively prohibited. There are similar areas—or there were—in Eastern Canada. Why was not a similar order observed here? There is a law prohibiting the burning of settlers' slash under hazardous circumstances. Why has this not been enforced and extended? It is required that privately owned railways take precautions with regard to sparks from locomotives which are not applied to the Government railways. Why not? River drivers, prospectors, fishermen, hunters and campers persist in leaving fires unextinguished, in throwing matches, cigar butts, cigarette stubs and pipe ashes into dead leaves, and lumbermen persist in leaving slash ready for a lightning bolt to start the conflagration. Why is this? The answer is because we are all blind fools, hoping against hope that past experience and misfortune will not come again but knowing full well that the fool must always pay for his folly. Canada has lost thousands of dollars and a number of lives in forest fires this year. This is an absolutely irrecoverable loss and there will continue to be such losses until we have the sense and the courage to remove each removable cause as soon as a remedy for it is found.

JANUARY IS COMING.

There are several reminders just now that January is coming. One is the thought by comparison with the very hot weather we have just been having, another is the plea of the coal man to get ready for cold weather, and another is the fact that the Chairman of the Technical Section and the Chairman of the Committee on Program are already making plans for the annual meeting of the Canadian Pulp and Paper Association. No one, who has attended past meetings, will for a moment think of them as in any way unsuccessful or unsatisfactory but they can be made far more valuable to the members and to the industry in Canada if the membership will enter a little more heartily into the preparation of material for discussion.

The collective experience of many of the successful societies which have been holding enthusiastic meetings for many years is that the secret of a successful meeting is a general and thoughtful discussion of the subjects presented in the form of papers. Well considered discussion can come only by previous reading of the papers, with time to collect ideas and data on the subject. For the last few years, by dint of extremely hard work and last minute type setting and proof reading, the committee has been able to provide reprints of papers for distribution at the meetings. This has some advantage but it is far from being satisfactory. The committee is beginning its work for the annual meeting this early in the hope that better co-operation will be forthcoming from the members, making it possible to distribute copies of papers to members and others interested, at least two weeks before the annual meeting. This will require that papers to be read at the meeting shall be in the hands of the secretary not later than the 1st of January. Then by distributing a copy of each paper to each member the papers can be carefully read before the meeting and a great deal of valuable time conserved by the reading at the meeting of just an abstract of the paper as a guide to the discussion and a suggestion for comment. In a case where lantern slides have to be used the previous reading of the paper will be like reading a book before seeing the story in the movies. A great deal more interest will result because of the

more intelligent following of the pictures and the explanation of them by the author.

In past years the program committee has had to rely on a few of the old standbys for papers. These men while always glad to exert themselves, often times at considerable inconvenience, for the benefit of the section, get a bit tired of being worked all the time. There are many members of the section who may have fully as much ability to prepare interesting papers as those who have been so generous with their time in the past. The committee cannot be intimately acquainted with the experience or the hobby of each member. It is certain, however, that many have had experience which would be very helpful indeed to the membership at large and would from the basis of a discussion which would not only be helpful to others but to those men also. A certain amount of modesty is a good thing but when the man is a member of an organization of the nature of the Technical Section he should be willing to make a little sacrifice fr the benefit of others, if for no other reason than to pay them back for the benefits he has derived. The member who is not willing to do so is in the class of the man at a prayer meeting where the discussion was about salvation and the fact that it is free. This old gentleman in giving his testimony said that he was glad to say that he had enjoyed salvation for 25 years and it had not cost him 25 cents. The minister, who had a sense of humor and ready wit remarked. "May God bless his stingy soul."

There is a point in this for members of our section. The benefits of the meeting and the service of the secretary, the committees and of the official organ, are at the command of every member. About 15 per cent of the members are holding office or serving on committees. They are giving thought and effort and time to this work week after week while there are other members who positively refuse to come across with so much as an opinion when called on at a meeting and cannot be induced, persuaded, stampeded or frightened into preparing a paper even on a subject regarding which they are known to have considerable experience and information. It is time for a few of these hard shells to loosen up a little and time for a few of the more modest members who perhaps because of their more recent membership, hesitate voluntarily to prepare a paper for the annual meeting, to come forward. The Program Committee purposely does not include technical discussions at the summer meeting so as to concentrate such efforts at the annual meeting.

There are many benefits derived by the men who prepare a paper. This is recognized by many colleges in the provision that a Thesis shall be written as a requirement for graduation. The reason is that by writing down his thoughts and conclusions, the man is forced to concentrate his attention upon the subject, it becomes more firmly fixed in his mind and in order to prepare a satisfactory paper or report he must reason the matter out carefully. His mind is thus trained, while at the same time it is being stored with information of value. In expressing his willingness to prepare a paper the man thus becomes known as one who is willing to accept responsibility and such men are greatly needed in these days. The publication of a paper read before an organization of the standing of the Technical Section adds to the author's reputation and may be the means of bringing to him opportunities for promotion. It also extends the circle of his friends and acquaintances and puts him on speaking terms, as it were, not only with the other members of the Technical Section, but with readers of the official organ as well, and a man who adds several thousand persons to those who know him is not doing himself a bad turn.

While making this plea for members of the section to offer to prepare something in the way of a paper, those who cannot possibly do so should at least be willing to read the papers carefully and discuss them, and if not present at the meeting to send the secretary their criticisms and suggestions on the subjects discussed. A couple of meetings carried out along such lines would so conclusively prove the advantage of proceeding in this manner that we are sure all succeeding meetings would bring forth such a volume of excellent papers that the plan of the council for carrying on through the year, an open Technical Section forum in the official organ, would be accomplished.

In conclusion we wish to urge as forcibly as cold ink will do it, that each member tell the secretary some little thing that he has been doing, some subject upon which he has obtained information by experiment or experience, and agree to write it up for the annual meeting. Furthermore, each member should consider himself as belonging to the Program Committee and to be on the lookout for material which others of his acquaintance might have that could profitably be brought before the section. This kind of co-operation and mutual service is the greatest possible factor in making the Technical Section the most successful organization of its kind. It was the first to be organized among English speaking paper makers and should always maintain its supremacy in the quality of its papers and discussions.

COBWEBS.

A friend calls our attention to a report in the Board of Trade Journal in London of a change in the Swiss Tariff, and adds: As a sign of the times you might be interested in knowing that the duty on paper underclothes has gone up from 40 francs per 100 kilos to 90 francs per 100 kilos. Five years ago any tariff that included such an item would have caused considerable amount of amusement.

Two features are not in this issue because a letter mailed in Toronto on Saturday had not arrived on Wednesday.

A reader of our Magazine, way out in Victoria, B.C. dispels our piscatorial ignorance thus: "Oh, yes, fish can run. The salmon are **running** here now, and the packers are canning the **run**."

Decay of Pulp Wood and its Effect in the Soda Process

By E. SUTERMEISTER.

The growing scarcity of pulp wood and its rapidly rising price are causing considerable uneasiness among those pulp and paper companies which are not so fortunately situated as to control holdings which perpetuate their supply. This conditions of affairs in its turn is causing more attention to be paid to the condition of the wood as received from the forests and to the problem of storing it under such conditions that it will not further deteriorate before use. In the past only a very few mills have paid much attention to this question and as a result, to quote from a progress report by the Forest Products Laboratory, "losses from decay in the wood pile at many mills are staggering, the amount of deterioration depending on the method of piling, age of the wood and sanitary condition of the yard."

That phase of the problem which relates to the kinds of fungi attacking wood, and more especially ground wood, has recently received much consideration in the technical press, but there is altogether too little available information regarding the proportion of commercial pulp wood which decays in the storage piles or how seriously such decay affects the yields and bleaching properties of the fibres prepared by the soda or sulphite processes. Any study which would show the percentage of rotten wood in a given pile, or as it was supplied to the digesters, would necessarily have to be carried out on a large scale and over a considerable period of time, in order to give information of any value. This would render the collection of such data a relatively expensive matter. The effect of decay on the yield of fibre, and upon its properties, is, however, comparatively simple to ascertain by means of small scale cooks and the following is a record of such investigations which were carried out to supply some of the desired data.

Poplar.

Quality of Wood.—Several grades of wood were used in this work, each being as nearly as possible representative of certain characteristic conditions. (1) Green wood was taken from an Aspen tree cut within two weeks of the time the cooks were made. (2) New sound wood was represented by a stick of peeled wood taken from a car which was being unloaded at the wood yard. This wood was not green, but there was no way of knowing just how long it had been cut. It is quite certain, however, that it was perfectly sound and that it had been stored in such a way as to avoid decay. (3) To represent sound wood from storage a stick was selected from a pile which had been in the yard three years. This sample was found to show evidence of incipient decay and the chips prepared from it appeared a little more brittle than usual. On the whole it was considered to be fairly sound wood, but to check the results obtained from it Sample 4 was selected. This was from the same pile but near the bottom where it had been kept under very wet conditions.

For comparison with these good samples two specimens of rotten wood were selected. Sample 5 was from a tree which had died and became punky while standing. It showed no external evidence of fungus growth but it was in such condition that it could be pushed over quite easily and although it was fully four inches in diameter it could be snapped in two very readily by striking it against another tree. The condition of this stick appeared to be very uniform throughout. Sample 6 was selected as being the rottenest specimen which could be found in the storage pile. It was not entirely uniform, as there were places where it was relatively sound, but these portions were avoided so far as possible when taking the samples for testing so the results are actually based on the rottenest grade of material.

Before starting any of the cooks the condition of the samples was studied by cutting rectangular blocks from representative portions of the sticks. These blocks were weighed as soon as cut and their dimensions measured as accurately as possible; they were then dried to constant weight and again measured. Drying caused more or less warping and checking so that the measurements could not be made with so much accuracy as with the wet blocks. For this reason the figures for volume bone dry, per cent shrinkage, and pounds per cubic foot of dry wood are subject to slight errors which, however, are not great enough to affect seriously the comparative results.

The results of these observations on the wood samples, together with values calculated from them, are given in the table below.

These figures show the variations which may be expected in the weight per 100 cu. ft. of sound wood from different logs and indicate clearly the loss in weight which is caused by decay without, at the same time, a corresponding diminution in volume.

Soda Cooks.—Soda cooks were next made on these different samples using a small rotary digester holding about two pounds of chips and heated by a gas flame. The moisture in the chips when they were charged into the digester was taken into account when calculating the strength of liquor to add so that the grams per litre of cooking liquor includes all water entering the digester either as caustic solution or as moisture in the chips. Each cook was brought to 110 lbs. steam pressure as quickly as possible, usually in about 40 to 50 minutes, and this pressure was maintained for five hours. The digester was then cooled rapidly, and the contents removed and washed at once. The following

Sample No.—	1	2	3	4	5	6
Weight of wet blocks in gms.	1,643·0	352·5	652·0	3,865·0	487·0	192·0
Weight of dry blocks in gms.	782·6	274·8	349·0	1,975·7	264·5	94·8
Per cent moisture in wood	52·3	22·0	46·5	48·9	45·7	50·6
Volume of wet blocks, cu. in.	126·5	47·6	57·7	318·8	63·8	24·4
Volume of dry blocks, cu. in.	118·4	42·6	53·0	295·8	60·7	21·0
Apparent shrinkage, per cent	6·4	10·5	8·2	7·2	4·9	14·0
Lbs. per cu. ft. of wet wood, wet weight	49·50	28·20	43·10	46·20	29·10	30·00
Lbs. per cu. ft. of wet wood, dry weight	23·57	22·00	23·03	23·60	15·80	14·80
Lbs. per cu. ft. of dry wood	25·20	24·58	25·15	25·48	16·60	17·20
Lbs. per cord of 100 cu. ft. wet wood	2,357	2,200	2,303	2,360	1,580	1,480

table shows the per cent of caustic soda added and consumed by the wood, both being based on the bone dry wood used; the strength of the cooking liquor in grams per litre of caustic soda; the yield of good fibre and screenings based on the bone dry wood used; and the per cent of bleach required by the air dry fibre. The bleach indicated is that which will give a color that is considered satisfactory for commercial soda fibre.

Sample No.	Cook No.	Per cent NaOH added.	Per cent NaOH Consumed	Strength G.P.L.	Yield. Good fibre.	Yield. Screenings.	Bleach required per cent.
1	1	25	21·5	70	40·7	0·0	7·5
1	2	25	21·4	70	41·5	0·0	—
2	1	25	21·8	70	41·7	0·0	8·2
2	2	25	21·8	70	41·4	0·0	—
3	1	25	21·9	70	38·6	0·0	14·0
3	2	25	21·9	70	38·5	0·0	—
4	1	25	21·3	70	45·3	0·0	8·0
4	2	25	20·8	70	43·6	0·0	—
5	1	30	25·6	70	31·4	0·0	15·0
6	1	25	23·3	70	—	—	—
6	2	25	23·6	56	29·8	5·7	Over 24

Considering these yields in connection with the weight per cord of 100 cu. ft. of solid wood the following figures are obtained:

Sample No.	Description.	Bone dry wgt. per 100 cu. ft.	Per cent yield good fibre.	Yield per cord, lbs. bone dry.
1	Green Aspen	2,357	41·10	968
2	Sound wood, from car	2,200	41·55	914
3	Sound wood, from pile	2,303	38·55	888
4	Sound wood, from pile	2,360	44·45	1,049
5	Rotten wood, died standing	1,580	31·40	496
6	Rotten wood from pile	1,480	29.80	441

The yields from the various samples, when considered on the basis of a cord of 100 cu. ft. of solid wood, make an interesting study. The highest yield is given by sample 4 which has been stored under very wet conditions. It hardly seems possible that this could be responsible for the high yield and it is more likely that it is a peculiarity of this individual log. Samples 1 and 2, both of which were sound wood, give the next highest yields, while sample 3, which was only very slightly decayed, yields slightly less than the lowest yield from the sound wood. This appears to confirm the opinion that decay had started in this specimen for when it has proceeded as far as in samples 5 and 6 the yield is only about half that of sound wood.

Quality of Fibre.—Apart from differences in the amount of bleach required the fibres from the various samples of wood show differences which are probably characteristic of their physical condition. The unbleached fibre from samples 1, 2, and 4, all of which were sound wood, is of about the normal color for soda poplar. Sample 3, which was supposed to be sound, but which proved to be very slightly attacked by decay, gave a slightly darker fibre than the sound samples. Both samples of decayed wood produced dark fibre, the wood from the pile giving a much darker product than the other.

After bleaching the fibre from both lots of rotten wood is very hard and rattly when made into sheets and does not resemble a raw soda fibre so much as it does one which has been given a prolonged treatment in the beater. The other bleached samples are about normal although that from sample 3 might be considered slightly harder than the others. This is in line with the darker color of the unbleached fibre and the greater amount of bleach which it requires.

It was attempted to make pebble mill beating tests on the bleached fibre, just as is done with sulphite spruce, but the fibre from the rotten woods broke up so completely during the beating that no sheets could be made on the hand mould. The bleached fibre from the sound wood could be handled easily in this test and gave a bursting strength of 13 lbs. Ashcroft.

White Birch.

Wood Used.—The first sample was from a tree cut in April and used in the tests within two or three weeks. No. 2 was perfectly sound, No. 3 was an intermediate grade in which decay appeared very general but which was not so punky as No. 4 which was the rottenest grade available. Logs for samples 2, 3 and 4 were taken from a pile which had been in storage for three years. The bark was still intact when they were taken and the wood on the ends appeared dry and firm; in fact they were in such a condition that from a superficial examination they would have been rated as sound. On cutting them open they were found to vary from sound to very rotten, and while the decay did not extend uniformly throughout all parts of the sticks, it was general enough so that representative material could be obtained for the experiments.

As in the case of poplar a block of each grade of wood was cut to dimensions and weighed as soon as cut; it was then dried to constant weight at 105 deg. C. and again weighed and measured. The results of these shrinkage and moisture tests are as follows:

Sample No.	1	2	3	4
Weight of wet block in gms	705·8	3,667	470	286
Weight of dry block in gms	352·8	2,120	289	188
Per cent moisture in wood	50·0	42·2	39·5	34·3
Volume of wet block, cu. in.	37·81	229·8	37·81	37·81
Volume of dry block, cu. in.	37·34	223·2	36·09	35·19
Apparent shrinkage, per cent	1·2	2·8	4·6	7·0
Lbs. per cu. ft. of wet wood, wet weight	71·13	60·80	47·37	28·81
Lbs. per cu. ft. of wet wood, dry weight	35·57	35·15	29·11	18·97
Lbs per cu. ft. of dry wood	35·99	36·18	30·51	20·37
Lbs. per cord of 100 cu. ft. wet wood	3,557	3,515	2,911	1,897

These figures are remarkably concordant and show very plainly the increase in the shrinkage on drying and the decrease in the dry weight per cubic foot as decay proceeds.

Soda Cooks.—The wood was prepared for cooking by cutting the logs into discs and then chipping these by hand. This permitted a careful sorting and selection of the chips so that those used were of the same quality as the blocks which were weighed and measured.

The small scale soda cooks were made in the same apparatus and in the same way as with poplar. The following table gives the cooking data and the results of the cooks for birch wood:

Sample No.	Condition of Wood.	Per cent NaOH. Added.	Consumed.	Strength G.P.L.	Yield of. Good fibre.	Screenings.	Bleach required per cent.
1	Green	25	20·2	70	41·2	0·0	13·5
2	Sound	25	21·9	70	41·6	0·0	16·0
3	Partly rotten	25	22·8	70	35·6	3·5	Over 25
3	Partly rotten	25	22·7	70	36·1	0·8	20·5
4	Very rotten	25	25·0	70	10·4	20·5	Black with 25
4	Very rotten	30	28·6	70	17·4	6·9	Much over 25
4	Very rotten	35	28·9	70	13·8	0·9	Much over 25

Two other cooks of sound birch, made under the same conditions but carried out several years before, gave an average yield of 41·1 per cent of good fibre and 0·2 per cent of screenings, which agrees very well with the present results.

The figures in this table prove that the longer birch wood is stored and the more it is attacked by decay the greater is the amount of caustic soda which it consumes in cooking, the lower is the yield of fibre and the greater is the amount of bleach which the fibre requires to bring it to a standard color. In the case of the rottenest wood, which is an extreme condition, it cannot be reduced to fibre with much less than 35 per cent of caustic and the fibre is practically unbleachable, the color produced with 25 per cent of bleach being only a brownish yellow. The seriousness of the decrease in yield is even more marked if the figures are considered in connection with the weight per cord of 100 cu. ft. of solid wood. These may be tabulated as follows:

Sample No.	Condition of Wood.	Bone dry wgt. per 100 cu. ft.	Per cent yield good fibre.	Yield per cord, lbs. bone dry.
1	Green	3,557	41·2	1,465
2	Sound	3,515	41·6	1,463
3	Partly rotten	2,911	35·9	1,046
4	Very rotten	1,897	13·8	262

Quality of Fibre.—The color of the unbleached fibre becomes darker as decay increases and there is a very marked difference between the fibre from sound wood and that from the rottenest sample. A study of the table of cooking data shows that this difference in color is doubtless due to substances which are very resistant to the action of bleach, so that it is practically impossible to bleach the fibre from the rottenest sample to a commercial color.

Microscopic examination shows that the fibres from the partly rotten wood are in fair condition though more of them are broken than in the case of sound wood. The fibre from the very rotten wood is quite different as it is much broken up and disintegrated into fragments of all sizes and shapes. Not all of it is broken up for there are some long fibres which appear to be in a normal condition, but in general it has the appearance of fibre which has been subjected to a very severe beating treatment. This probably offers an explanation of the hard and rattly nature of the sheets made from this fibre.

Pebble mill beating tests were made on the unbleached fibre from the sound and the partly decayed wood, the former giving a bursting strength of 45 lbs. and the latter 52·6 lbs. Ashcroft test. It proved impossible to make sheets of the beaten fibre from the very rotten wood for it broke up so much in the pebble mill that no satisfactory hand mould sheets could be made. It appears from these tests that the wood is so affected by decay that the fibre is more easily affected by beating than that from normal wood. Microscopic examination of the beaten fibres proves this to be true, as there is much more fragmentary material in the fibre from the partly rotten wood than in that from the sound wood, while the fibre from the rottenest wood is disintegrated to a very much greater extent.

Cook of Rotten with Sound Wood.

Up to this point all cooks had been made on digester charges which contained only one grade of wood for each cook, and while it was quite obvious that it was a waste of time and money to cook all rotten wood it was not proved how much harm a small amount of rotten wood would do when cooked in admixture with a much larger amount of sound material. In commercial cooking there is always an excess of caustic soda and it seemed possible that this excess might be great enough to take care of the extra requirements of the rotten wood and reduce it to a pulp which would not be very harmful. To investigate this point a cook was made upon a mixture of chips containing 85 per cent of sound wood and 15 per cent of the rottenest grade. The standard cooking conditions were employed for this cook, viz., 25 per cent of caustic soda, 110 lbs. steam pressure and a duration of 5 hours at full pressure. The yield obtained was 37·3 per cent of good fibre and 0·6 per cent of screenings, while from the results of previous cooks it was calculated that a yield of 37·4 per cent good fibre and 0·1 per cent of screenings was to be expected. The caustic consumption was predicted as 23·0 per cent and found to be 22·1 per cent.

The color of the stock from this cook was much darker than that from sound wood alone and slightly darker than that from the partly decayed wood. A good many dark brown shives were present; these closely resembled those present in the fibre from the partly rotten wood. Bleaching tests proved that this fibre could be bleached nearly to standard color with 23 per cent of bleach, but that the shives did not entirely disappear.

Relative Costs.

In order to get some idea of the increased cost of the fibre produced when rotten wood is used the following figures are assumed:

	Poplar.		Birch.	
	Sound.	10 p.c. rotten.	Sound.	15 p.c. rotten.
Wood per cord	$15·00	$15·00	$12·00	$12·00
Labor	5·18	5·18	5·18	5·18
Bleach (at 1.8c.)	1.31	1.38	3.74	5.08
Miscellaneous	15·78	15·78	15·78	15·78
	37.27	37.34	36.70	38.04
Yield of bleached fibre per cord, assuming 2 p.c. loss on bleaching.	948	896	1,434	1,203
Cost per 2,000 lbs. bleached fibre	$78.58	$83.30	$51.20	$63.24

While these figures do not represent actual mill costs they are sufficiently accurate to show the increased cost when rotten wood is used, and they indicate that each per cent of rotten wood entering the digester will increase the cost per ton by 45 to 80 cents. This is based on materials and labor only, and if fixed charges and the loss in producing capacity of the plant were taken into consideration the difference in favor of sound wood would be still more pronounced.

Summary.

Decay in pulp wood decreases the weight per cubic foot out of all proportion to the shrinkage in volume.

Decayed wood gives a much lower yield of pulp by the soda process than does sound wood.

The fibre from decayed wood is difficult or impossible to bleach to a satisfactory color.

Decay so affects the fibres that they disintegrate very rapidly when beaten.

The cost of fibre is increased by about 45 to 80 cents per ton by each per cent of thoroughly rotten wood entering the digester.

FORTY-FIRST EDITION OF FRENCH DIRECTORY.

The forty-first annual edition of Annuaire de la Papeterie Universelle has been received by the Pulp and Paper Magazine and we wish to compliment the publishers, Messrs. L'Homme & Argy, of 9 Rue La Grange, Paris, for the very excellent contents and appearance of this helpful directory. There are 746 pages with the various sections printed on different colors and different grades of paper, which, at the same time represent a number of different styles of finish. It is really a very complete list of mills making pulp and paper throughout the world, together with the addresses of paper dealers and printers in Paris, agencies of mills elsewhere in France and much useful information with regard to the names and sizes of commonly used papers and boards in France, Trade customs, tariffs, etc. The advertisers are classified and indexed very carefully according to all kinds of materials and supplies for paper mills. The price of the volume is 20 francs and may be obtained from the publishers or from Marchant Singer and Company, 47 St. Mary Axe, London, or in Spain, from G. E. Julienne, 90 Calle Bailen, Barcelona.

PAPER CLUB LUNCHEON.

The Paper Club of Montreal got off to a good start on July 6th when they were entertained at luncheon at the Queen's Hotel as guests of the Canadian Pulp and Paper Association. In spite of hot weather and many absences from town, there was very fair attendance. Mr. H. F. E. Kent, chairman of the Book and Writing Paper Section of the Association. In commenting on conditions in the paper business, he said that we are in a very trying situation and labor conditions must be settled before there can be real progress. A serious case at present is the attitude of the striking printers, who, in effect, demand a 30 per cent. increase in wages. General business simply cant stand any such concession. It would mean that most job printing would be cut out and paper would pile up, putting two industries in bad shape.

Mr. Kent expressed the opinion that business would improve in the Fall.

President Reynolds of the Paper Club expressed the appreciation of that organization to the hosts and predicted a successful future for the club.

Others who were called on and made remarks abbreviated by the temperature were: Mr. I. H. Weldon, Provincial Paper Mills; J. N. Stephenson, Pulp and Paper Magazine; Harry Bell, E. B. Eddy Co., and Pierre Rolland, Rolland Paper Co.

ILL 10,248 DAYS.

Time lost by members of the Laurentide Mutual Benefit Association in the fiscal year of the organization ending on June 1 aggregated 10,248 days due to illness, according to the report of the secretary, A. G. Richardson. If this time were charged to one man it would keep him off the job for twenty-eight years and twenty-four days. Computing the average number of employees as 1800, if all were ill at the same time, the plant would have been closed for 5.69 days.

The Metropolitan Life Insurance Company, which carries the insurance, paid to employees for these reported periods of illness, the sum of $18,999.57. Previously this had been a total loss to the employees. There was also paid out in death claims the sum of $4200 in the first year, for two deaths among the members of the L.M.B.A. The percentage of deaths among each 100 men insured was .116 a remarkably low figure.

EXPERIMENTAL DIGESTER READY.

The experimental digester, work on which has been going on at Grand'Mere for several weeks past, is now ready for operation, and the first long cooks of pulp to temper the lead lining to the heat have been completed. These cooks averaged about sixteen hours.

The digester is one of the most complete installed in any paper mill. It has a capacity of half a ton of pulp, one-twentieth of the capacity of the large digesters, thus enabling experiments on a sufficiently large scale to be satisfactory in result. In connection with the digester, there is a complete weighing and measuring apparatus, for chips, acids and pulp. Mr. O. F. Bryant of the Research Department will have charge of most of the pulp experiments with the new digester. As soon as all the accompanying experimental apparatus is ready for operation, the cooks will take the same period as the larger digesters, about eight hours.

Our chief trouble at present is the "ex" in export.

EXPORTS OF PAPER, WOOD PULP AND PULP WOOD.

Exports of Canadian Produce—Months, of May 1920 *and* 1921; *and two months ending May,* 1919-21.

		Month of May		Two months ended May.		
		1920	1921	1919	1920	1921
Paper						
Book paper	Cwt.	4,311	1,364	4,958	7,119	7,678
	$	38,898	18,909	58,771	64,200	102,705
Newsprint paper	Cwt.	1,341,490	883,557	2,103,109	2,240,832	1,832,826
	$	5,935,556	4,682,393	7,356,717	9,763,097	9,924,286
Other paper	$	964,892	561,945	1,353,170	1,841,403	967,910
Total Paper	$	6,939,346	1,263,247	8,768,658	11,668,700	10,994,901
Wood Pulp—						
Sulphate (Kraft)	Cwt.	231,957	158,050	273,009	395,490	256,153
	$	1,000,862	664,085	870,786	1,621,590	1,088,515
Sulphite, bleached	Cwt.	160,056	88,369	158,248	291,217	129,080
	$	980,543	508,642	708,623	1,709,212	762,987
Sulphite, unbleached	Cwt.	482,725	187,398	465,450	880,084	286,142
	$	2,337,567	739,263	1,856,857	3,924,803	1,143,643
Mechanically prepared	Cwt.	279,439	326,299	417,071	478,103	390,369
	$	779,710	754,288	574,616	1,286,079	885,715
Total Wood Pulp	Cwt.	1,154,177	760,116	1,313,778	2,044,894	1,061,744
	$	5,098,682	2,666,278	4,010,882	8,541,684	3,880,860
Pulp Wood	Cord	76,648	54,914	131,032	117,081	127,931
	$	841,735	717,818	1,237,388	1,262,476	1,695,355
	Country of Destination.					
Paper and Manufactures of—						
To United Kingdom	$	306,696	86,602	384,454	651,213	125,869
United States	$	5,670,602	4,514,155	6,838,730	9,401,284	9,466,346
Other Countries	$	962,048	662,490	1,545,474	1,616,203	1,402,686
Wood Pulp—						
To United Kingdom	$	196,656	697,081	531,426	711,224	698,521
United States	$	4,617,033	1,752,844	2,639,3550	7,123,858	2,828,262
Other Countries	$	284,993	216,353	840,106	706,602	354,077
Pulp Wood—						
To United States	$	841,735	717,818	1,237,388	1,262,476	1,695,355
Total Paper, Wood Pulp and Pulp Wood—						
To United Kingdom	$	503,352	783,683	915,880	1,362,437	824,390
United States	$	11,129,370	6,984,817	10,715,408	17,787,618	13,989,963
Other Countries	$	1,247,041	878,843	2,385,580	2,322,805	1,756,763
Totals	$	12,879,763	8,647,343	14,016,928	21,472,860	16,571,116

FOREIGN CHEMISTS COMING FOR EXPOSITION.

That European Chemical industries are intensely interested in the forthcoming Chemical Exposition in New York was ascertained by Worth Colwell, who returned from Europe this week. Mr. Colwell is one of the exposition's publicity battery and with a member of his staff visited England, France and Switzerland. In London after presenting the various phases of the exposition to Dr. J. P. Longstaff and Sir William Pope of the Society of Chemical Industry, assurances were given that the British chemical experts will be well represented at the American exposition when it opens the week of September 12th, in the Eighth Coast Artillery Armory — the largest building of its kind in the country. The Society is holding its annual meeting in Canada the last week in August.

In France, leading chemists stated that they intend to make the trans-Atlantic trip for the event and in Switzerland a number of experts are especially interested in the development of chemical machinery in the United States. The future of the Dye Industry is a topic much discussed abroad and also the fuel problem. The French are particularly interested in the latter, the exposition's representative ascertained, largely because gasoline is costly there and the matter of securing substitutes for gasoline or 'essence' is of vital importance. While the development of gasoline substitute in the United States is largely neglected the foreign chemists are forging ahead. The use of benzol in combination with alcohol is becoming more extensive abroad and, as is well known, practically all of the substitutes for gasoline are dependent upon alcohol.

You, see, we must keep out cheap foreign goods lest the foreigners make enough money to buy our surplus farm products. — Baltimore Sun.

Technical Section

REVIEW OF RECENT LITERATRE.

A-1; E-0. Digestion of Woody Fibers with Chlorine. P. WAENTIG and W. GIERISCH. **Text. Forshchung,** ii, 69-79 (1920); **Chem. Zentr.** xci, 4, 544 (1920); **J. Soc. Chem. Ind.,** xxxix, 817A (Dec. 31, 1920). For the production of cellulose from wood shavings of 0.2-0.3 Mm. thickness the authors recommend a preliminary boiling with 0.1 percent sodium hydroxide for one hour, then treatment with chlorine for several hours without heating, and after the removal of hydrochloric acid a final treatment in 1 percent sodium hydroxide solution at the ordinary temperature with stirring. Thick shavings and chips may be digested with chlorine under six atmosphere pressure. A preliminary heating with 1 per cent alkali is necessary in the treatment of cereal straws. The chlorine process is not suitable for the production of textile fibers from jute and rushes, but it might be applicable to hemp, flax, ramie and nettles.—A. P.-C.

A-3.Studies on Bast Fibers. II. Cellulose in bast fibers. Yoshisuke Uyeda,, **J. Ind. & Eng. Chem.,** xiii, 141-3 (Feb. 1921). The estimation of cellulose in bast fibers (of Korean hemp) was made by three methods, viz., Renker's modification of Cross and Bevan's metod, the original Cross and Bevan method, and Johnsen and Hovey's method. The chemical behavior of the cellulose obtained is studied from the standpoint of cellulose chemistry, and Renker's modification of Cross and Bevan's method is suggested as the most practical method for the estimation of cellulose in bast fibers from the textile chemistry point of view. The function of pectin substance in bast fibers is discussed. It is suggested that the cellulose of the hemp fiber has, in some degree, an oxy-cellulose structure.—A. P.-C.

A-7. American Sulphur Industry. RAYMOND F. BACON and HAROLD S. DAVIS. **Chem. Met. Eng.,** xxiv, 65-72 (Jan. 12, 1921). The present status of the industry is reviewed with special reference to recent operations in Texas. The advantages of sulphur over pyrites as a source of SO_2 are discussed, and the effect of traces of petroleum and the properties and uses of sulphur, with particular emphasis on its usefulness as an engineering materal, are described.—A. P.-C.

A-14. Measurement of the Opacity and Translucency of Paper. RAYMOND FOURNIER. **Papier,** xxiii, 257-9 (Nov. 1920); **Paper,** xxvii, 23 (Feb. 9, 1921). Translation by A. Papineau-Couture.—A. P.-C.

H-4. Hypochlorites for Bleaching Paper Pulp. RAPHAEL SANSONE. **Rev. Univ. Papeterie,** iii, 13-4 (July 1920; 16-8 (August 1920); 13-6 (Sept. 1920); 15-7 (Nov. 1920); **16-8** (Dec. 1920). Description of various forms of equipment which may be used for the preparation of bleach liquors from bleaching powder and for the preparation of sodium hypochlorite bleach liquors.—A. P.-C.

A-11. Chemistry of Satin White. A. CONBENZL.. **Chemiker Zeitung,** 661-2 (Sept. 7, 1920); **Chem. Met. Eng.,** xxiv, 221-2 (Feb. 2, 1921). Satin white is a calcium aluminate mixed with hydrated calcium sulphate. It is of particular value in the manufacture of coated paper. The chemistry of the process of manufacture (interaction of milk of lime and aluminum sulphate) is discussed special emphasis being laid on the importance of the alkalinity of the aluminum sulphate used and of having the pigment in the proper state of colloidal dispersion to obtain good lakes. The author has devised the following process for the manufacture of satin white: about 90 Gm. of lime is slaked in 220 Cc. of boiling water; to this solution are quickly added 130 Gm. of finely pulverized (260-mesh sieve) aluminum sulphate of the proper degree of acidity; the mass is heated until it becomes almost solid, when 250 Cc. of water is added and the mixture agitated thoroughly. —A. P.-C.

A-14. Improved Glarimeter. L. R. INGERSOLL. **Paper,** xxvii, 23, 18 (Feb. 9, 1921). The glarimeter devised by the author some years ago (see **Electrical World,** lxiii, 645, Mar. 21, 1914) has been improved by replacing the optical system of the "glariscope" or polarimeter part of the original instrument by a modification of the so-called Pickering polarimeter (for mathematical treatment see **Proc. Am. Acad. Arts and Science,** ix, 1 (1873); xxi, 294 (1885). The instrument has been given a more convenient and compact form and several time-saving devices have been added. Some of the uses to which it may be put are briefly discussed. A. P.-C.

A-15; R-2. Advances in Cellulose Chemistry. EMIL HEUSER, **Cellulosechemie** for April 30, 1920; **Paper,** xxvii, 18 (Jan. 19, 1921); 19 (Jan. 12, 1921); 20 (Jan. 19, 1921). A review of contributions to the chemistry of cellulose from 1915 to the present day, including Freiberger on the determination of the "gum number" and the copper number of cotton cellulose. Hagglund on the determination of the copper number, Haller, J. H. Barnes and Heermann on the investigation of the action of mordants on cotton from the point of view of the adsorptive capacity of cellulose, Schwalbe and Becker on cellulose slimes, Noyes on the formation of formic acid esters, Ost on the formation of cellulose acetates, S. Leysieffer on the relation between the viscosity of cellulose nitrate solutions and certain other properties of the nitrates, Lenze and Pleus on the determination of the chemical constituents of nitrocellulose, Netthofel on the one hand and Heuser and Herzfelt on the other on hydrocellulose, Samec and Matula on cellulose dextrins, Madaen on "cellodextrin" and other degradation products of cellulose, Netthofel on the decomposition of cellulose to glucose, Denham and Woodhouse on the formation of cellulose esthers, and Pictet and Sarrasin on the distillation of cellulose under reduced pressure and its probable relation to laevolguecsan.—A. P.-C.

A-15; K-7. Cellulose Mucilage. JESSIE E. MINOR. **J. Ind. & Eng. Chem.,** xiii, 131-3 (Feb. 1921). A review and discussion of recent researches on cellulose chemistry with a view to developing teh following propositions: (1) The first step in the decomposition of cellulose forms a mucillaginous soluble dextrin which easily reduces Fehling's solution. These dextrins, as soon as formed, are adsorbed by pure cellulose, thus forming a reactive insoluble aggregate, called hydrocellulose. (2) Mucillage differs from hydrocellulose in the

larger percent of soluble adsorbed dextrins present. (3) These adsorbed dextrins serve to catalyze the hydrolysis of cellulose. (4) Complete hydrolysis leaves only soluble dextrins. (5) Mucilage ,possibly through its colloidal nature, has a greater power of adsorbing water than has pure cellulose. (6) Cold water immersion causes a slow hydrolysis and weakers adsorption, so that mucilaginous products are destroyed as rapidly as formed. (7) With methyl red as indicator, it is possible to detect the increase in the alkalinity of the hydration of pulp. (8) Pulps with an original high coppe rnumber, owing to the large amount of catalyst present. (9) The copper number of bleached pulp can be increased by a careful acid treatment prior to beating. (10) Cellulose mucilage will spilt a salt and adsorb the metal ion more easily than pure cellulose, owing to the more colloidal state. (11) Moisture or acid treatment aids dyeing by forming mucilage. See also **Pulp and Paper**, xviii, 497 (May 6, 1920); 939-42 (Sept. 9, 1920); 1238 (Dec. 2, 1920).—A. P.-C.

B-9. Pulpwood Resources of Chile. World's Paper Trade Rev.; Paper, xxvii, 21, 29 (Jan. 26, 1921). Brief review of Chilean supplies of wood suitable for the manufacture of paper pulp, and of the advantages of starting a pulp industry in that country.—A. P.-C.

B-9. Wood Consumption and Forestry. HUGH P. BAKER, **Paper,** xxvii, 20 (Jan. 19, 1921). Sketch of the rate of consumption of American forests and of the great importance of the application of forestry to the maintaining of proper production of paper in the future.—A. P.-C.

B-9. The National Forestry Progress in the U. S. R. S. KELLOGG, **Paper,** xxvii, 21 (Jan. 26, 1921). A comprehensive analysis of the history of the program, and of the program itself.—A. P.-C.

D-4. Pulp Stones.—Making Paper. Paper, xxvii, 20 (Jan. 19, 1921). A brief description of the method of quarrying and finishing pulp stones for the manufacture of groundwood pulp.—A. P.-C.

H-6. Electrolytic Alkali and Chlorine Industry in Europe. JOHN B. C. KERSHAW. **Chem. Met. Eng.,** xxiv, 77-82 (Jan. 12, 1921); 119-22 (Jan. 19, 1921); 167-70 (Jan. 26, 1921). Outline of the development of the electrolytic alkali and chlorine industry in the United Kingdom, Germany, Austria, France, Italy, Switzerland, Russia and Belgium with a description of the various cells employed, including the Castner-Kellner cell, and process, Solvay cell, Hargreaves-Bird cell and process, Gibbs cell and process, Griesheim Elektron cell, Billiter-Siemens cell, Aussig gravity cell, Billiter-Leykam cells, Kellner mercury cell, Outhenin-Chalandre cell, and the Basel type of cell.—A. P.-C.

K-11. Ventilation of Paper Machine Rooms. EDWARD A. RYAN, **J. Engineering Intitute of Canada; Paper,** xxvii, 21 (Jan. 26, 1921). A thorough discussion of the ventilation problem for paper machine rooms, together with a description of the methods at present in use.—A. P.-C.

K-11; M-7. Briner System of Vapor Absorption. E. A. BRINER. **J. Engineering Institute of Canada; Paper,** xxvii, 22 (Feb. 2, 1921). Discussion of paper on heating and ventilation of paper machine rooms by A. Ryan (see preceding abstract). From an engineering point of view some form of fan system for air supply and fan system of exhaust afford the most practical system for obtaining proper ventilation. A very large amount of heat is required to evaporate the water from the wet sheet of paper and to raise the temperature of the surrounding atmosphere sufficiently to enable it to carry off all this moisture without any condensation; but by proper recirculation the amount of heat required may be reduced approximately 50 percent. At the present practically all the heat which is drawn up through the exhaust fan is wasted. The Briner economizer is intended to recover a large amount of this heat by using it to preheat the air supply. In the Briner system of vapor absorption on paper machines the principal object is to supply a series of blasts of hot dry air to the sheet on the drying machine instead of against the cold roof. The importance of proper roof construction in preventing condensation is briefly dwelt on and the system of ventilation used at the Temiskaming plant of the Riordon Company is described.—A. P.-C.

K-18. Strawboard Manufacture. RICHARD CLAYTON, Paper, xxvii, 5 (Oct. 6, 1920); 8 (Oct. 27, 1920); 16 (Dec. 22, 1920). An account of the method of making straw board.—A. P.-C.

K-18. Board Mill Chemists' Problems. JOEL PFISTER, **Paper,** xxvii, 18 (Jan. 5, 1921). Brief description of some of the problems which a chemist in a board mill can help to solve.—A. P.-C.

K-18.—Quality of Paper Board. HARRY BERT, **Paper,** xxvii, 17 (Dec. 29, 1920). A discussion of the relation between the quality of paper board and the coal consumption and nature of the stock (mixed papers **vs.** fiber box cuttings and corrugated cuttings).—A. P.-C.

M-9. Conveyor for Shredded Pulp. Paper, xxvii, 21, 33 (Jan. 26, 1921). Brief description of the method of operation of the "Airveyor", showing its advantagesfor the conveying of any bulky material in which the pieces are small and which is not sticky and fragile.—A. P.-C.

O-3. Methods of Water Purification. WILLIAM MACKLIN TAYLOR. **Chem. Met. Eng.,** xxiv, 123-8 (Jan. 19, 1921). A thorough discussion of the respective merits and disadvantages of methods of water-softening by filtration through zeolites, by chemical precipitation and by rectification with boiler compounds, showing that each problem must be studied thoroughly in order to determine which method is best suited for obtaining the desired results.—A. P.-C.

R-2. U. S. Papermaking Patents for 1920. Paper, xxvii, 20 (Jan. 19, 1921), 21 (Jan. 26, 1921). A list of the patents granted by the U. S. Patents Office during 1920, arranged according to the classification of that office. Compiled by Clarence Jay West.—A. P.-C.

R-4. How to Stimulate Salesmen. Paper, xxvii, 21 34 (Jan. 26, 1921). A few suggestions for the stimulating of salesmen: sales convention, sales contests, sales quotas, sales bulletin, graphical analyses of territories, sales manuals, school of salesmen.—A. P.-C.

R-5. Paper Industry in Finland. JAMES E. CAMPBELL. **Paper,** xxvii, 17 (Dec. 29, 1920). An analysis of the prospects of development of the paper industry in Finland, showing the preat possibilities for standard grades of paper (print, magazine, book).—A. P.-C.

R-6. Natural Organization. GEORGE A. GALLIVER, **Paper,** xxvii, 21 (Jan. 26, 1921). Various examples are taken from organized life to show that the law of progress in Nature is organization. The necessity of applying the same principles to the business world is pointed, taking as example the organization of the human body.—A. P.-C.

UNITED STATES NOTES

Former Postmaster General, A. S. Burleson, who has been in Germany investigating the possibilities of marketing American cotton, reports that Central Europe has become so accustomed to using paper substitutes for many textile articles that the task of getting back the market there for American cotton is an extremely difficult one while the German mark remains at its low and wildly fluctuating value. White paper table cloths and napkins have been in general use for nearly five years, and even the best hotels in Berlin no longer feel it necessary to provide linen or cotton cloths for their tables. Great rolls of heavy crinkled paper are kept in all restaurants and hotels. Waiters cut table lengths from these as required. The same system is resorted to in private houses. Germany has an abundance of paper and the price is low. Woven paper cloth has replaced cotton, woolen and silk fabrics almost entirely as upholstering and drapery material in car furnishings. Woven paper towels and tablecloths have been perfected which can even be washed two or three times.

According to Charles M. Wright, a leading Kalamazoo paper jobber, paper for use in American public schools and other educational institutions is likely to be far short of the needs this year. Mr. Wright quotes a manufacturer of papers suitable for school uses as saying that available stocks of such paper have been almost used up and very little of it is being produced at present. This means that there will be a lively scramble for what school stock is in sight with resultant high prices.

Plans for construction work on a new factory at Richmond, Va., for the recently formed R. A. Cauthorne Paper Company have been decided upon and, with actual building operations getting under way soon, it is expected that the plant can be opened for operations some time in October. J. H. Wallace & Co. of New York, have charge of the construction. The building will be of brick and concrete, and of the most modern design. The Cauthorne Company is capitalized at $750,000. It will manufacture blotting paper, book and envelopes. Carl Magnus, a graduate of the University of Maine paper course, will head the new factory.

A Beloit paper machine which, it is claimed, will prove to be the fastest in the world, has been installed in the mill of the Consolidated Water Power and Paper Company at Wisconsin Rapids, Wis. When first put in operation the monster machine ran at a speed of from 800 to 900 feet a minute. It is expected to have it running at a rate of a thousand feet a minute within six months and to have it going eventually at its capacity speed of 1,500 feet a minute. The machine's length is in excess of 300 feet and it uses 164 inch wires. It turns out a sheet of newsprint trimming at 156 inches. A year was required to build the monster, and its installation has been in progress for several weeks at the Consolidated plant.

J. M. Caine, president of Caine Brothers Paper Company, New York City, asserts that the paper industry is picking up, but that demand fluctuates so markedly that "everybody is kept on the jump" trying to figure out what to buy and when to buy it. Mr. Caine, who is in touch with jobbers, consumers and producers, regards stimulation of the export trade as one of the best means to eliminate the slump in the industry. "There seems to be a generally fair demand for our paper abroad," he says, "and with a little attention and consideration paid to terms and packing I see no reason why the export business in this line may not be built up steadily in the near future. Even if it does nothing much but increase the volume of business done, disregarding any profits on exports, it will have a beneficial effect in that it will tend to stabilize prices and demand." As to supply, Mr. Caine says that paper jobbers and brokers have no difficulty in filling all orders they receive.

The Federal Forest Service is preparing to open a new experiment station at Asheville, N.C., for the purpose of obtaining information bearing on the best methods of handling forest lands in the Southern mountains. Steady depletion of the Southern Appalachian timber supply is responsible for the location of this station. The general timber situation is exceedingly serious, official foresters say, three-fifths of the original timber stand has been destroyed or utilized and a considerable percentage of the remaining two-fifths is made up of inferior second growth. One-half of the timber left is in three Pacific Coast States—Washington, Oregon and California. The Appalachian Forest Experiment Station will deal with the problems of a forest area approximately equal to twice that of pre-war Germany.

Courses in pulp and paper manufacture under the direction of Prof. Ralph H. McKee, of its Department of Chemical Engineers are included in the prospectus of the twenty-second Summer session at Columbia University, New York. Instructors chosen to assist Prof. McKee, include Hugh P. Baker, Secretary of the American Paper and Pulp Association, Bjarne Johnsen, head of the research division of the Hammermill Paper Company; Sigmund Wang, chief chemist of the Riordon Company, Ltd.; J. A. Hayes, manager of the New York division of the Chatfield and Woods Co.; N. R. Hopkins, sales manager of the Oxford Paper Co., and Fred C. Clark, Director of the Department of Technical Control, American Writing Paper Company. The pupils will include two Vice-presidents of corporations, one mill manager and more than two score of industrial workers.

Wage reductions ranging from 13 to 30 per cent, and affecting about 3,000 men and women employed in Kalamazoo paper mills, were announced last week by paper company managements there. The cut went into effect last Monday, and is in addition to the pay decrease made several months ago when the post-war bonus was discontinued. The new scale for common labor in most of the Kalamazoo mills is 45 cents an hour. This in some instances is the same rate as was in effect May 1, 1919.

Numerous forest and brush fires in Northern and Central California, which caused damage estimated at more than $1,500,000, were reported extinguished last Saturday after most of them had burned for forty-eight hours.

News From Europe

Profiteers in Paper.

Under a display head, Paper Profiteers, the Frankfurter Zeitung says: One of the Hansa banks is offering shares in the newly erected paper and board mills of Upper Bavaria with a capital of 15 million marks. It is interesting that stockholders receive 60% dividends from business on the inland markets at current prices, and a further 30 per cent. on one-half of the foreign production is anticipated. The basis of these returns is the price of 280 marks per 100 kilos of paper, while the recent price of 400 marks per 100 kilos has yielded a "frozen reserve" of 9 million marks, equivalent to 60 per cent. of the capital. These figures are less expressive of the prospects of the Upper Bavarian paper and board mill than of the conscienceless and usurious level of present paper prices. Yet these new concerns assert that a "well-conducted and well-managed paper mill has reached profits up to 100 per cent." The natural result of these profiteering advertisements is a rapid drop in prices.—Tapeten-Zeitung, May, 1921.

High Speed Paper Machines.

It may be useful to reproduce here some of the European comment on American high speed machines. The Paper Trade Journal of Finland devotes a brief notice to the 1,000 feet a minute machine of the Sewall and Bagley Co. La Papeterie observes that this speed, even if it is obtained, is practically of short duration. In addition to the difficulties of building such a machine, the "service" must be extremely skillful. It is by no means easy to find attendants of this kind. Then the possibility of breaking the sheet plays an important part,—an accident which, obviously, must be remedied without delay. It seems hardly necessary to say that the conclusions of the writer in La Papeterie will not be new to American makers of machines. For example he says (1) the speed of the pulp on the wire must at least be equal to the speed of the machine; (2) the number of press rolls, the length of the wire and the number of suction boxes must be sufficiently great to effect a thorough hydroextraction, in order to avoid uneven pressure of the paper under the first press rolls; (3) the rolls, drying cylinders, etc., must fit adequately (!); and (4) the drying cylinders must be provided with a system of hydroextractors.

All this, remarks a writer in the Papier-Zeitung, is not very original or helpful. The writer adds that reports from America state that the high speed is attained partly by the use of ball bearings. A correspondent is more explicit (Papier-Zeitung, May 12, 1921): "The most important point," according to this writer, "is not understood by La Papeterie. This is the electrical drive (intersectional drive). The drive of the paper machine is divided into parts, for example, wet end, press rolls, etc., each group having a special electrical drive."

A German Salesman in the United States.

Writing to the Tapeten-Zeitung in regard to the sale of paper, particularly wall paper, in the United States a correspondent says: In Europe we scarcely realize the importance of "window dressing," of display. In Chicago the large shops frequently change the decoration of their windows every other day, and "Saturday window dressing" is universal. In the case of wall papers the designs, coloring and ultra-modern effects are nearly always English, French, and Belgium; German rolls being conspicuous by their absence. The fault, as the correspondent frankly states, is the German habit of misunderstanding American trade conditions. Thus the books of paper samples were not sufficiently modern, as the new samples had not been issued in book form so that they could be exhibited in the United States. Moreover German paper makers had not yet got a clear-cut idea of the immense size of American business. Nevertheless the outlook for German paper products in the United States is at present favorable.—Tapeten-Zeitung, May 15, 1921.

(The paper trade might do some "window dressing" with profit).

Est-il Quelqu'un?

A writer in La Papeterie, who calls himself Jean Bart and who, like Voltaire and Moliere, has another name, is very quizzical about the Swedish Cellulose Association. His remarks are worth notice, because clearly anyone with two names must surely be somebody, This Scandinavian Association he says, is "disloyal and illegal." What is worse it is probably a violation of the "penal code." He is not quite sure, but there is no doubt that there are "false brothers" among its members, and that the "dominant note in Scandinavian mentality is to act the Artful Dodger." (Jouer la partie du plus malin). The label on the whole concern, he concludes, is "combine" and its aim is to maintain prices and "la Vie chere". In this design the Swedes have formed a coalition "from which no sharp practice is excluded."

It seems worth while to give a faithful summary of such vehement language. It is certainly an odd paradox that men of business cannot combine in their own interests. M. Jean Bart is amusing, but he puts one in mind of a famous essay. Hazlitt divides amassers of fortunes into two opposite classes; lean, pernurious-looking mortals, or jolly fellows who are determined to get possession of the good things of the world because they want to enjoy them. The latter he tells us, "eat, drink, and sleep their way into the good things of this life. For instance the greatest number of "warm" men in the Street are good, jolly fellows, who are larded with jobs and contracts, stuffed and swelled out with layers of bank-notes and invitations to dinner. (Especially the latter!).

The particular type of association described by Hazlitt is for the moment "démodé," or, rather, as M. Jean Bart says, it does not exist in France. But would not anyone, who did not know the facts from the newspapers, say that it did?—La Papeterie, May 10, 1921.

Paper Fibers of Brazil.

One of the most recent books on textile fibers and cellulose is the work of a Brazilian, Dr. Pio Correa. It is published by the Minister of Agriculture, and it is certainly surprising to read that one of its objects is to furnish the exhausted European nations with wood and to guard against the "destruction of trees". The author remarks that it is difficult to "count" the modern works on this theme. All the same the destruction of trees outpaces Nature. He sees a tree-less age ahead, and among fibrous materials that deserve careful trial are Hibiscus tiliaceus, Typha dominbenois, Hedychium coronarium, Cecropia, a few of which are now in practical use in Brazil. There are also handsome monographs on jute, canapa, the agave.—INDUSTRIA della CARTA, May 1921.

We have heard of fresh-water sailors, but Admiral Sims seems to be the original hot-water sailor.



Members of The Technical Section, C. P. & P. A. at the Cascade Inn, Shawinigan Falls.

GENERAL CHEMICALS.

Current Wholesale Prices in New York Market.
Week of July 6th, 1921.

		Carlots	Less Carlots
ACID, Acetic, 56%	100 lbs.	4.00 - 4.25	4.50 - 5.50
" Glacial, 99½ % carboys	100 lbs.	9.75 -10.00	10.25 -10.50
" Hydrochloric	100 lbs.	1.50 - 1.65	1.75 - 2.00
" Sulphuric, 66 deg. drums	ton	21.00 -22.00	22.50 -23.00
ALCOHOL, Ethyl	gal.	.... -	4.90 - 5.05
" denatured, 188 proof	gal.	.... -	.31 - .36
ALUMINUM Sulphate, commercial	lb.	.01¾ - .02	.02 - .02½
" iron free	lb.	.02½ - .02¾	.03 - .03½
Ammonium Chloride, granular white salammoniac, normal)	lb.	.06½ - .06¾	.07 - .07½
" (gray salammoniac)	lb.	.07½ - .08	.08 - .08½
BARIUM Sulphate (prec.) (blanc fixe)	lb.	.04½ - .05	.05½ - .06
BLEACHING POWDER (Calc. Hypochlorite)	100 lbs.	2.15 - 2.25	2.35 - 2.50
CHLORINE, gas, liquid cylinders (100 lb.)	lb.	.08 - .09	.09½ - .10
GLYCERINE, C. P., drums extra	lb.	.... -	.16 - .16½
LEAD nitrate	lb.	.... -	.15 - .20
LITHARGE	lb.	.08¼ - .08½	.08¾ - .09
METHANOL, 95% (Methyl Alc.	gal.	.... -	.77 - .80
POTASSIUM Bichromate	lb.	.17½ - .12	.12¼ - .12
" Hydroxide (Caustic potash)	lb.	.05 - .05¼	.05½ - .06
" Prussiate, yellow	lb.	.24½ - .25	.25½ - .26
SALT cake	ton	.... -	27.00 -30.00
SODA ASH, light	100 lbs.	2.15 - 2.20	2.30 - 2.70
" " dense	100 lbs.	2.40 - 2.45	2.50 - 2.75
SODIUM BORATE (Borax)	lb.	.06 - .06¼	.06½ - .07
SODIUM CARBONATE (Sal Soda)	100 lbs.	1.90 - 2.00	2.10 - 2.40
SODIUM HYDROXIDE (Caustic Soda)	100 lbs.	4.15 - 4.25	4.30 - 4.80
SODIUM PRUSSIATE, yellow	lb.	.12½ - .12¾	.13 - .13½
SULPHUR, Crude	ton	20.00 -22.00	.... - ....
SULPHUR Dioxide, liquid (cylinders extra)	lb.	.08 - .08½	.09 - .10
ZINC Oxide, XX	lb.	.09 - .09¼	.09½ - .10

In the New York chemical market, no outstanding event of interest for the past week is reported. Opinion is expressed by many that soda ash prices should be revised downward. Chicago reports a well-defined improvement in last fortnight. Caustic soda is still firm; also soda ash.

NEW OXYGEN PLANT, AUGURS INDUSTRIAL IMPROVEMENT.

In these days of general industrial depression it is refreshing to note the spirit of optimism evidenced in the announcement recently authorized, that the Dominion Ogygen Company, Limited, will break ground in mid-July for a new quarter-of-a-million-dollar oxygen present capacity. The building will be 100 ft. by 100 plant at Montreal, which will double the company's ft. and will be substantially a duplicate of the company's Toronto plant, which until now has supplied oxygen to Canadian industrial users through five district distributing stations. The Montreal plant will be the second of five producing plants projected at the time the company was organized last year.

They are now producing stainless steel. In time we may have the stainless steel trust.

FRENCH MILLS IN SERIOUS SITUATION.

Mr. Thorsten Lundgren, of Stockholm, who is a director of the Swedish Association of Chemical Pulp Manufacturers and also of the Swedish Association of Groundwood Pulp Manufacturers, has been sent to France to study the conditions in the paper industry, and to try to arrive at an amicable settlement with the French Association (Syndicat des Fabricants de Papier et Carton de France). He has already created a very favorable impression among the French paper makers.

In the course of a visit to the French journal "*La Papeterie*", he stated how strongly he had been impressed by the critical condition of the French paper industry.

"I have just landed after a month's stay in England, where I have seen that the paper makers are facing a very difficult situation; but my countrymen, who themselves have serious difficulties to handle, could not form an accurate idea of the state of affairs in your industry, and they certainly could not imagine that its situation could have become so critical. It is absolutely necessary that something should be done to help it out of its present crisis, and in reporting my findings to Sweden I shall advise that the demands of the French paper makers be complied with as far as possible."

These demands, as formulated by the "Syndicat", are as follows:

1.) A reduction in contract prices, which should be of at least 30 per cent for quantities to be delivered in 1921; while for 1922 and 1923 deliveries the price should not be more than 15 per cent above the market price at the time of delivery.

2.) The buyer (only) shall have the option of extending the time of delivery, for 50 per cent of the quantities contracted for, over a period which may extend up to the opening of navigation in 1923.

3.) The buyer (only) shall have the option of paying 50 per cent of the contract price (as agreed according to paragraph 1 above) at the time of delivery, for the 1921 deliveries, the balance being paid at the time of the deliveries extended to 1922 and eventually to 1923.

4.) The buyer (only) shall have the right to annul all or part of the deliveries; but shall have to pay an indemnity to be agreed upon.

5.) The buyer shall have the option of making a new contract with the vendor for future deliveries, the conditions of which will permit of an advantageous distribution of payments with those of the present contract after reduction of the latter in accordance with paragraph 1 above.

The "Syndicat" concludes by saying that the above are the minimum concessions which are considered necessary to the French firms which are hit the lightest by the present onerous contracts. The members need not be bound by the above in their private negotiations with the vendors, but reserve themselves the right to demand greater concessions depending on their individual situations and on the conditions of their respective contracts.

Such is the general trend of the French demands, which involve about 30,000 tons, while the English contracts involve about 200,000 tons.

"I understand quite readily, said Mr. Lundgren, that the present condition of the paper market requires that the concessions to the French paper makers be made as generous as possible as regards reduction in prices and terms of payment. But on the other hand the situation of our pulp manufacturers must also be considered. On the strength of their contracts, the Scandinavian banks made advances to them, which enabled them to buy wood, coal, and the other raw materials which they required to fulfill their contracts. The banks are now refusing to extend the credits or to advance more funds on these same contracts on which the pulp makers depended to refund the loans.

We must therefore find an amicable settlement which will protect the interests of both parties, and I have not the least doubt that with a little good will this can easily be done."—A. P.-C.

(La Papeterie, June 10, 1921.)

HOW RAW MATERIALS MINGLE IN PAPER MAKING. *

I remember how pleased I was when first I realised that nature was imitated by the paper-maker in such a simple operation as paper sizing and the analogies I was able to draw. For instance, resin is the residual product of the distillation of tree sap, and sap protects the wood from rain; therefore a tree robbed of its sap is deprived of its water resisting property. Now, in preparing wood for papermaking the resins are eliminated, and the paper made from such wood pulp would be water leaf and non-ink-resisting, but the paper maker imitates nature by putting resin back again with the wood fibres in the beating engine. And, again, a buffalo hide and a rabbit skin keep the occupant dry during its lifetime, and when dead the skin may be used as a covering for paper, *vide* gelatine — animal sizing.

To contemplate the likeness of the ultimate fibres to their respective stems is aesthetic. The esparto fibre, one-thirtieth of an inch in length and one two-thousandth of an inch in thickness, is of cylindrical shape, with tapering ends, resembling the stem from which it is extracted.

In looking at a field of corn one sees the kinks or bends in the yellow stalk, and knows that it contains thousands of cells of fibres with similar kinks which characteristic in the fibre helps to give the paper made from it a slightly different physical form from that of esparto. Again, paper is water-borne. No other liquid will perform the same function. On a fast running machine in three or four hours twenty, thirty, fifty thousands gallons of water will have deposited a mere two or three hundred gallons of fibre on a piece of wire. A continuous flood rushes on and is rushed off after a few feet of travel. Enough water to wash the small quantity of fibre into nothingness, but it is only a carrier and a gentle depositor. At one point the fibres and their attendant accessories are whirling units, and a few moments later they have become a homogeneous sheet, made so by the friendliness of the water. Jostling, clinging, intertwining, down lie, fibre, resin, alum china clay, starch and color in a common watery bed emerging undrowned and unified, to become mankind's great messenger of thought.

* A paper read by Mr. Heckford to the Technical Section of the Paper Industry in London.

The Barrett Company is helping the publicity campaign of the National (U.S.) Forestry Program Committee by making a feature of appropriate statements by R. S. Kellogg on the Snell Bill in a full page advertisement next week in the Saturday Evening Post. The Barrett Company specializes in wood preservation, the Snell Bill aims at timber perpetuation.

The Markets

NEW YORK MARKETS.

New York, July 9—(Special Correspondence)—The quieting influence of the mid-summer slackening of business is plainly in view in the paper market, and just at present there is no important activity in any branch of the trade. Certain kinds of paper continue to move in relatively good amounts, but on the whole business is indeed slow, with the situation developing characteristics quite common for this season of the year. The situation at manufacturing centres is such that numerous plants have closed down entirely for a period of several weeks. On the other hand, this condition is, as stated above, nothing unusual for the middle of the summer. Invariably at this time mills shut down for a fortnight or so to complete inventories and to make machinery repairs, and it can be said that, other than the usual slowing up of demand, the market has undergone no additional depression. The complexion of the situation is decidedly better than it was several months ago. The outlook is distinctly encouraging, manufacturers and dealers alike report customers to be showing increasing interest in deliveries for August and September, although most of them are still reluctant to place orders, and indications certainly are that with the passing of the summer, conditions in the paper trade are due for improvement.

Probably the leading development of the week has been the reopening of newsprint mills, following the agreement between mill owners and employes to place the wage question in the hands of an arbitration committee. Most of the plants agreeing to the arbitration plan resumed operations last Monday or Tuesday, and reports say that in nearly every case striking workmen returned to work. The mills of the International Paper Company, which did not enter the arbitration agreement, also reopened on Tuesday, inviting employes to return to work at a reduction in wages, the fixed rate of pay to be left open until after the arbitration committee hands down a decision, and it is understood that enough men came back to enable a majority of the company's mills to resume.

What effect the resumption of production will have on the newsprint market is at the moment problematical. This is the season when consumption of print paper is at the lowest, and current buying in the open market is at a minimum, logically, because the average publisher is getting along with contract supplies for the time being without having to purchase spot lots of paper. Quotations on newsprint are easy, as would be expected under ruling circumstances, though no actual changes have taken place. Around 5 cents a pound at mills is the price commonly quoted by domestic manufacturers on spot shipments of roll news, with now and then reports received of a sale at slightly under this figure. It is reported that Scandinavian and German producers are making offers of roll newsprint at prices which figure out down to as low as 4·25 cents a pound landed here, and the naming of such prices on foreign paper naturally has a weakening influence on the domestic market.

Book paper manufacturers are readjusting wages of the employes of their plants on a nearer normal scale. Those in the Kalamazoo district this week announced a reduction ranging from 13 to 30 per cent, effective July 11. Whether this will affect prices on book papers is a question. The probabilities are that it won't because quotations on book papers have been declining so steadily for sometime that manufacturers doubtless were obliged to revise wages. Machine finished book is quoted at 6·50 to 7 cents a pound, super at an average of 8 cents and coated book at 10 to 11 cents.

Demand for box boards, which for a time recently was fairly active, has slumped again, and the market has relapsed into a condition quite characteristic of mid-summer. Boxmakers are doing little new buying and prices are gradually easing off. Plain chip board has sold this week down to $28 per ton delivered New York, although a more common quotation is $30, while filled news board is available to consumers at $32·50 to $35 per ton New York. There is a good inquiry for boards for delivery next month, and the interest evinced by buyers indicates that they expect a considerable pick up in business within a few weeks.

Fine papers are dull. Demand is solely against direct requirements, and prices are very irregular. Wrappings are moving in small quantities mainly and are quotably unchanged. Tissues are in a moderately lively market position and quotations hold. Coarse tissues are freely sought and there is enough demand for fine tissue to maintain prices at around a basis of 95 cents per ream for No. 1 white.

GROUND WOOD—Unfavorable water conditions, compelling grinding mills in various parts of the States and Canada to close down, make for a decidedly firmer tone in ground wood. Demand is such at present that prices are given little opportunity to advance, but there is a strong upward tendency in view, and members of the trade express the belief that were newsprint mills running anywhere near at capacity, ground wood would quickly rise to $50 or more per ton. Sellers having pulp on hand are prompted by ruling conditions to hold back in offering stock out, and buyers consequently are having increasing difficulty in locating sizable tonnage. About the lowest now quoted by domestic grinders is $30 a ton at pulp mills on spruce ground wood of prime quality for immediate delivery and only in cases where producing plants are situated far from consuming points and an extra heavy freight is involved can mechanical pulp be bought for less.

CHEMICAL PULP—Although ground wood is firm, the chemical pulp market is exactly the opposite. The tone is weak, demand is close to negligible and prices on most grades are constantly moving lower. The main reason for this situation, according to representative pulp dealers, is that Swedish manufacturers are offering sulphite and kraft pulp to America at surprisingly low prices—in frequent cases at below the levels prevailing on domestic pulps. It is reported on good authority that the Swedish Cellulose Association has abandoned its minimum price agreement and that producers in that country are acting independently in an effort to market some of their surplus stocks of pulp at whatever prices can be realized. Offerings to this



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INQUIRIES SOLICITED:

market are increasing, and some members of the trade here express fear that the Swedes may duplicate their action of 1907 in dumping large quantities of sulphite on the American market and causing prices to tumble to levels unprofitable to manufacturing. It is known that No. 1 unbleached Swedish sulphite has been offered down to 3·50 cents a pound landed here, this price including a commission to the importer, while Scandinavian kraft is reported available at 3·25 cents landed and easy bleaching sulphite at 4·50 cents.

Domestic manufacturers are endeavoring to maintain quotations, but consumers obviously are doing little buying while awaiting developments which would seem to be in their favor. Domestic news grade sulphite is a bit lower in price, sales at 3·25 cents per pound having been reported.

RAGS—The papermaking rag market is distinctly quiet. Demand for a majority of grades is next to nil, so to speak, and those grades that are moving are wanted by consumers only at spasmodic intervals and in small lots. Prices are easy, and everything favors buyers securing desired supplies at almost any figures they are inclined to bid. New cuttings are especially dull, and while some dealers are holding back in attempting to effect business with mills, others are exerting pressure on buyers in an effort to dispose of a part of their holdings. Roofing rags have sold this week at 75 cents a hundred pounds at shipping points for No. 1 packing and 65 cents for No. 2 grade, denoting a further decline. Old repacked thirds and blues of city origin are available at 1·75 cents per pound, and No. 1 repacked whites at 5 cents and less, and No. 1 miscellaneous whites at 4 cents.

PAPER STOCK—Less business has been recorded in old papers this week than in some time. With paper and board mills in numerous cases shut down, demand has sagged considerably, and most of the shipments made have been on back orders. As is usually the case when demand decreases, prices have weakened, and sales of No. 1 soft white shavings have been reported to mills at 2.25 cents a pound f.o.b. New York, of No. 1 hard white shavings at 2·75 cents, of heavy No. 1 books and magazines at 85 cents a hundred, of old No. 1 kraft paper at less than 2 cents, and of white blank news cuttings at 1·50 cents. Old folded news is bringing no more than 37½ cents per hundred pounds, while board mills are paying 30 cents a hundred as a maximum for No. 1 mixed papers.

OLD ROPE AND BAGGING—Unlike most other kinds of papermaking material, old rope is in a firm market position and prices, if anything, display an upward tendency. Four cents per pound at shipping points is the established price on old manila rope in No. 1 condition, and in some few instances mills have granted slightly in excess of this figure. Old strings are in fair call and are fetching one cent a pound at dealers' points. Bagging continues dull, and largely nominal in price.

"TWO RELATED INDUSTRIES."

Jubilee Souvenir of Kenwood Mills, Arnprior, Ont., Manufacturers of Paper-Makers' Felts.

The product of every industry is dependent on the product of some other industry at some part of the process of manufacture, and the paper-making industry, which has made such great strides in Canada in recent years, is, and has always been, dependent on the textile industry for what are know as "paper-makers' felts," hence the title of the Jubilee Souvenir of the Kenwood Mills.

This book was prepared under the direction of Perry Walton to mark the fiftieth year since the founder, Mr. F. C. Huyck, entered the business and the 25th year since the plant at Rensselaer, New York, was built. The book is tastefully produced and gives an interesting and instructive account of paper-making, both ancient and modern, and of the processes in the manufacture of paper-makers' felts. The souvenir is profusely illustrated with pictures descriptive of old-time plants, early paper-making machines and processes. Starting with the origin and development of paper it proceeds through the art of paper-making in Europe to the first paper mill in America, the era of rags, the invention and development of paper-making machines and the search for and experiments in new material for paper.

This is followed by the history of the Kenwood plants from 1870, when Mr. F. C. Huyck started to manufacture paper-makers' felts, and a description of the processes in the manufacture of seamless felts, the carding of the wool for spinning, ancient methods being contrasted with modern practice. The book gives the layman a wonderfully clear idea of the manner in which paper-makers' felts are made and one reads it through to the end with all the more pleasure because the story is presented in such a way that something of the romance of the industries may be seen.

One who frankly confesses himself to be in the wrong when he is, will be found mostly in the right.

Scandinavian American Trading Co.

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Acridine Yellow R.
New Phosphine R.
Chrysoidine Y. conc.
Basic Green B. conc.
Methyl Violet 2B ex.
Methyl Violet 4R ex.
Magenta Powder.
Bismarck Brown R. conc.
Safranine B.S.
Safranine R.F.F.
Methylene Violet 2R. conc.
Methylene Violet 2B. conc.
Malachite Green Crystals.
Methylene Blue B.B. conc.
Methylene Blue 1814.

SUBSTANTIVE COLOURS

Paramine Fast Pink B.
Paramine Sky Blue F.F.
Paramine Blue 2B.
Paramine Black B.H.
Paramine Yellow R.
Paramine Brown G. conc.
Paramine Brown M.
Paramine Fast Bordeaux B.
Paramine Green G.
Paramine Violet N.
Paraphenine Yellow G.
Diazamine Fast Yellow H.
Rosophenine 10B.
Benzopurpurine 4B.
Paper Black 3181

ACID COLOURS

Orange II.
Orange IV.
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MOUTHS AND BACKS.

There are more of them in the world than this time a year ago. That is the fundamental consideration in world economics. There are more mouths to be fed. There are more backs to be clothed. There are not more hands to work.

The marriage rate, the birth rate, the demand for new homes—houses—increase, even apart from reconstruction of building destroyed. But the war's toll of manhood was heaviest at exactly those ages which are industrially most productive. The demand is there, the supply is short.

Why then is trade in general "as idle, as a painted ship upon a painted ocean?"

Dislocation, a temporary, and especially a local, excess of certain annual crops, and consequent loss of buying power on the part of farmers, planters, furriers, and so on. The price of wheat drops, and like a stone cast into a pool, it disturbs most a narrow circle, but as the circle widens its violence lessens, and ere long all is serene. But if the pool is small, or broken up by barriers, there is a good deal of splashing. Derangement of distributive agencies, especially in central and eastern Europe, is a present barrier to such an orderly subsidence. Surplus goods cannot now be easily and smoothly exchanged among all countries. So the children in Poland starve while wheat is almost a drug on the market in America.

Undue postponement of liquidation is another factor. The whole world has been issuing bonds, and other promises to pay, lavishly. The issuers seemed to think that the fathers could eat sour grapes, and only the children's teeth would be set on edge. We find it not quite so easy to shift all the load on to posterity's shoulders.

There is a way we can carry that load ourselves. In fact, we've got to. If the farmer's large output of grain were offset by a proportionately larger output per man in every other productive occupation, the farmer would not suffer, and trade would not suffer, but would benefit. Every farmer's family could have all the material comforts and conveniences they desired, and every artisan's family would have food in abundance. Neither is the case to-day. So far, since the world started, there has never been a time when all the consumable and enjoyable wealth of the world, divided by the world's total population, would show an excess. When was there not some large part of the world anhungered, or athirst, or naked? We can begin to talk about overproduction when total supply exceeds total demand. What we've got to do is to **increase supply and find a way of improving distribution.**

Commerce is based on the creation of local overproductions. The surplus of one place is exchanged for the different surplus of another place. Brazil must raise more coffee than she can possibly drink, Australia more wheat than she can eat, Japan more silk than she can wear. Each must raise **too much** for her own needs, of that thing which she can produce most cheaply as compared with other countries. Then they exchange their surpluses. In this way each country can support a larger and more prosperous population than she could support directly on home-grown products.

Exchange of local overproduction is the only way the world can get along. The alternative would be what is happening in Russia, where a breakdown of means of distribution is followed by a great shrinkage in the population that normally grew at a faster rate than any other in Europe.

The rest of the world is not going Bolshevik. There are mouths to feed and backs to clothe, and it can only be done through foreign trade. Somehow human affection working through human intelligence is going to find a way, so as to care for its own. For one thing, people will come to remember that a piece of paper does not become gold coin by calling itself legal tender, and that what was normal parity between gold coins before the war is not the same as equivalence of paper promises to pay in other pieces of paper. The "par" or "normal exchange" of 1913 was a different thing from what had preceded it. It will be followed by a new "par," a new "normal." And trade will proceed as easily and as conveniently on the new, as it used to do on the old. Already there are signs of a growing appreciation of this fact, and a corresponding improvement in business.—The Caravel.

BRONZE BARS FOR BEATER ROLLS.

Paper makers will be interested in the following extract from a letter written us by a well known firm of paper makers, quoted in a letter from the bronze manufacturer.

"We installed a set of American Manganese Bronze Beater bars in a beater on No. 4 paper machine at Delaware Mills in 1914. These have been in continuous operation for 6 years and were last given a thorough inspection in January, 1921. They showed no wear whatever except on the edge in contact with the bed plate. We have estimated that Manganese Bronze beater bars will last 15 years. Steel bars never have lasted, under the same conditions over three years. The alum, filler and size used in the beater, corrode and erode the iron bar to such an extent that from an end view they look tapered toward the cutting edge.

The wood filling in our beater, equipped with the Manganese bars, has not been removed since the bars were originally installed.

The Manganese Bronze bed plate was removed at the end of 2½ years for inspection and it was found necessary to chip away a little of the wood filling. Steel bars in the bed plates necessitates chipping fillings once every six months."

They also state in this letter that the service in Jordan engines is similar to that in beaters except that it is more severe and bronze beater bars should last in the same ratio to steel as bronze Jordan bars to steel Jordan bars.

The advantages over steel to be attained through the use of Manganese Bronze are as follows:

(1) Will not cause discoloration of paper stock.
(2) Stronger and tougher.
(3) Will not corrode.
(4) Saving in cost of replacements through longer life.

The physical characteristics of rolled Manganese Bronze are as follows:

75,000 pounds ultimate tensile strength.
40,000 pounds elastic limit.
25 per cent in 2-inch elongation.

Another stronger and tougher bronze called Hy-Ten-Sil, which has been in service on Jordan engines, has characteristics in the rolled stock as follows:

110,000 pounds ultimate tensile strength.
65,000 pounds elastic limit.
12 per cent in 2-inch elongation.
Brinnell hardness of about 150.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., July 21st, 1921. No. 29

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

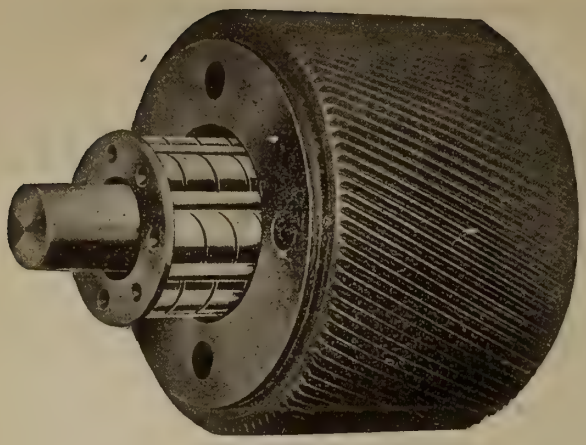
Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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Expanding mandrels are adapted to hold the shell burr as rigidly as the solid burr so that it does the same work but with a considerable reduction in cost. The use of an expanding mandrel eliminates the looseness and chatter so common in the solid mandrel with the hole and pin attachment.

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EDITORIAL

THE FOUNDER OF THE PULP AND PAPER MAGAZINE.

In May 1903 there appeared a little paper of 52 pages, 6 x 9 in size, entitled the Pulp and Paper Magazine of Canada. This project, which started in such a small way as a monthly paper and has since attained as a weekly of an average size of 100 pages, a recognized position among trade journals in the English language, was the conception of Mr. Emerson Bristol Biggar who recently died in Toronto. Mr. Biggar's foresight and enthusiasm for creation not only brought into being the Pulp and Paper Magazine but also the Canadian Textile Journal which is another publication purchased from him by the Industrial and Educational Publishing Company. His most recent venture in the publishing line was the establishment in 1917 of the first chemical paper in Canada, The Canadian Chemical Journal, now known as the Canadian Chemistry and Metallurgy. Mr. Biggar lived to be 67 years of age, a lifetime full of good works, of courageous effort and of helpful contributions to the industry and the literature of his time.

It is with more than regret that the editor and the publishers of the Pulp and Paper Magazine make mention of Mr. Biggar's passing.

It is fitting that the readers of the Pulp and Paper Magazine should have a brief review of some of the more important activities of this energetic and kindly gentleman. We quote from Canadian Chemistry and Metallurgy.

Mr. Biggar was born on his father's farm near Winona, Ontario, on March 6, 1853. He received his early education in that locality and for one year taught public school. His first newspaper connection was with "The Hamilton Standard." He was later Assistant Editor of "The Hamilton Spectator". In 1875 he went to South Africa where he remained five years. During that time he was connected with various papers in Cape Colony, including the "Cape Argus". He returned to Canada in 1880, and in 1883 started the "Dominion Dry Goods Report," the first paper for this trade in Canada. His interest in the textile trade in general dates from this time, and the present "Canadian Textile Journal" is a direct outcome. In 1886 Mr. Biggar established "The Canadian Exhibitor", a paper published in England to support Canadian export business. Its specific function was to represent Canadian interests in London at the time of the Colonial and Indian Exhibition.

In 1893 he established "The Canadian Engineeer", which was the first engineering paper of any kind to be published in Canada. Following in succession came such papers as "The Canadian Woodworker," "Canadian Pulp and Paper Magazine;" "Canadian Miller". In connection with the Pulp and Paper Magazine he has often told the writer incidents of early days in this Canadian industry. The vision of faith which he had in the industrial development of Canadian resources was amazing. This paper was started when paper mills were not so thick as they are now, and, as Mr. Biggar said "when there were not more than thirty possible subscribers in the whole of Canada."

His original writings were continued at all times, and include:

(1) A History of the Life of Sir John Macdonald.
(2) A sketch of the Battle of Stoney Creek.
(3) Longevity in the Maritime Provinces.
(4) A History of Canadian Journalism.
(5) The Beginnings of Bathurst (N.B.)
(6) The Canadian Railway Problem.
(7) The History of Hydro-Electric Developments in Ontario, (1920).

His only political venture seems to have been in 1911 when he strongly opposed reciprocity from various platforms. He was a regular contributor to the American and English press, and at different times has written special articles for most Canadian magazines and leading papers.

It is little wonder that a man of such accomplishments and keenness of intellect should foresee the enormous possibilities for Canada as a producer of pulp and paper.

Eighteen years ago the export of paper was not considered of sufficient importance to be referred to as a factor in Canada's exports. The volume and value also of pulpwood and pulp appear ridiculous at the present time in comparison with our record today, when the monthly record for the export of pulp under depressed business conditions is greater than the annual exports at the time the Pulp and Paper Magazine was established. From almost nothing in 1903 the exports of paper alone now amount to between 1 and 2 millions of dollars a week, and the production for home consumption has increased probably in proportion. In fact, an old timer, looking back at the number of mills that were operating at that time and comparing them with those of today, will be astonished at the developments that have taken place in less than a score of years, since this magazine was started. Not only has there been an increase of more than a 100 per cent in the number of mills manufacturing pulp and paper but the introduction of larger and faster machines in these newer mills has given an even greater increase in capacity.

The first issue of the magazine contains the following words of explanation and prophecy:

PULP AND PAPER MAGAZINE.

(From the Prospectus.)

If any one asks why the Pulp and Paper Magazine of Canada comes into existence, we give answer that such a magazine is inevitable. Canada is destined to be the greatest pulp and paper manufacturing country in the world, and naturally a country which leads the world in a special industry will require an organ of information and opinion to represent that industry. Canada possesses both the raw material for the trade and the facilities for manufacturing pulp and paper to an extent unequalled by any nation. Spruce is the best of all woods for the production of pulp, and while the spruce of Canada is admitted to be unsurpassed by that of any other region of the earth, the available quantity is probably equal to that of all countries combined, being estimated by the Dominion Statistician at 450,000,000 acres. Cheap and well distributed water supply and water-power are essentials for these industries, and in this respect also the advantages of Canada are pre-eminent. There are thousands of water-powers in the Dominion still unutilized, hundreds that have not been seen by the eye of a white man, and it is calculated

that the total water-power of Canada is 40 per cent. of the entire water-power of the world.

An intelligent people, who are rapidly increasing their manufacturing facilities in many directions and who are last developing their foreign trade, cannot fail sooner or later to realize what nature has thus placed within their reach. An earnest of what is in store for the Canadian pulp and paper industry is given in the following figures of the trade of the last few years.

It was only in 1890 that the exports of pulp and pulp-wood from Canada were considered of sufficient importance to give them a separate classification in the Trade and Navigation returns. In that year the exports of pulpwood were valued at $80,005 and those of pulp at $168,180. There exports have steadily risen until, in the last fiscal year, ending June, 1902, the Canadian exports of pulpwood amounted to $1,315,038, of which $120,445 went to Great Britain and $1,194,503 to the United States; while in the same year the exports of pulp reached a total of $2,046,398, of which $818,580 went to Great Britain, $1,170,400 to the United States, $40,965 to France, and the balance to European countries, Australia and China. It is estimated that Canada will in 1903 supply 25 per cent. of the requirements of the British pulp market. In addition to these exports, the paper and pulp mills of Canada now supply the home market to a greater extent than ever before.

These facts justify the existence of the Pulp and Paper Magazine, and we are glad to be able to say that subscriptions and advertisements already received in advance of this first issue show that our faith is well founded.

The Pulp and Paper Magazine was founded at a time when the present development was just about beginning; in fact, in the first issue of the magazine we read that the sulphite mill at Sault Ste Marie had been completed the previous year with a capacity of 60 tons, that the groundwood mill was then manufacturing 100 tons daily and that plans for a paper mill had been prepared for a plant on the American side of the river. Fortunately for Canada, this plant was eventually built on the Canadian side. At that time sulphur was imported mostly from Sicily at a cost of $25 to $30 per ton while the plant at the Soo was making cooking liquor from sulphur dioxide gas obtained from the roasting of Pyrrhotite. The advance in the industry since has been remarkable. The mill at that time was getting gas only of 5 per cent to 6 per cent sulphur dioxide and the cooking acid contained only 4 per cent of this compound. The mill had then not quite reached a production of 50 tons per day.

COBWEBS.

On another page of this issue is an article containing a number of suggestions with regard to the best procedure for taking samples of woodpulp and determining the moisture content. There has been a lot of writing and talking on this subject but there has not yet been the concerted action which would be most desirable in bringing about an accepted standard for this very important factor in the purchasing and sale of mechanical and chemical pulp. Probably one of the reasons why the problem is still a troublesome one is that a great many consumers of pulp do not realize the importance of this determination, in consequence of which most pulp mills do not find it necessary to establish such methods of operation as will provide their customers with packages of approximately uniform weight and dryness. If something more nearly standardized were required of the producer we believe that paper mills, finding it easier to make moisture tests, would do so more frequently and more accurately and there would be consequently less friction between them and the shippers of pulp. As we have repeatedly mentioned in these columns, there is, barring a little rubbing of corners, the same amount of fibre in the shipment when received at the paper mill as was loaded in the car at the pulp mill. It should be no more unreasonable therefor, to expect and anticipate the development of a standard method of analysis for the determining of this quantity of dry fibre in pulp than was experienced in the development of satisfactory methods of sampling and analysis of coal, limestone, and sulphur.

The principal difficulty is recognized as being a proper sampling of the product. A number of satisfactory methods for certain conditions have been put forward. We think the next step, which we believe to be the only way of settling the matter, is to hold a conference of the chemists, managers and purchasing agents interested in the selling, shipping and buying of mechanical and chemical pulp. If such a conference cannot arrive at a general acceptance of standard rules for sampling and testing, then it seems that the whole matter had better be dropped and each pulp mill left to come to an agreement with its customer, when making the contract of sale, as to the manner in which the pulp is to be tested for moisture, and possibly other qualities, on shipment from the pulp mill and on receipt at the paper mill.

A careful reading of the interesting series of articles on the Forestry in Scandinavia, which has been contributed by Mr. Edward Beck, cannot fail to impress thoughtful Canadians as to the decidedly unstable foundation that they are preparing for the future of the wood using industries by the present methods of handling, or rather mishandling, the forests of the Dominion.

THE FOREST FIRES SITUATION GREATLY IMPROVED.

Mr. G. H. Prince, Chief Forester for New Brunswick had advised the Pulp and Paper Magazine that the New Brunswick situation is very greatly improved by the general rains on the 15th, which makes the first rain of any consequence since last April. The dry period this year has been the longest and driest of which there is any record. The northern and central parts of the province escaped serious fires but there were several bad fires in the south, principally on burned over land. It is most fortunate that the loss of standing timber is comparatively light and this is surprising when the conditions are considered. The chief causes of the bad fires have been fishermen, campers and lightning.

Encouraging reports also come from the Chief Foresters of Quebec and Ontario to the effect that while there has been a great loss and serious situations, the result is less disastrous than had been at first thought unavoidable.

Canada owes an unending debt of gratitude to the courageous fighting of the fires that have threatened to bring diaster not only on the present generation, but reaching far into the future.

The Testing of Wood Pulp Shipments for Content of Air Dry Pulp*

The Emerson Laboratory, Springfield, Mass.

Among pulp buyers and manufacturers there seems to be need of detailed directions as to the method of testing all kinds of pulp shipments for weight and moisture content which will be sufficiently elastic to fit the needs of every condition of pulp, and yet sufficiently detailed to be a satisfactory guide to the inexperienced buyer or analyst as well as to the official analyst in matters of controversy. We have, therefore, drawn up the following tentative regulations and publish them in the hope that they may receive such careful study and discussion on the part of those interested in the matter as to bring about the formulation of detailed instructions which will meet the general need in the matter.

Determination of Gross Weight of Shipment.

The gross weight of a shipment of pulp should be ascertained by one of the following methods:

(1) The gross weight of the car lot may be taken on accurate railroad scales, less the tare of the empty car actually weighed. The marked tare of the car is not to be accepted unless verified.

(2) The sum of the net weights of trucks lots taken while loading or unloading.

(3) In the case of baled pulp, the number of bales may be multiplied by the weight of the average bale obtained by weighing 10 percent of the bales of the shipment, if the bales are reasonably uniform, or 20 percent in case the individual bale weights vary widely, according to the method hereinafter described.

(4) In the case of roll pulp, when the rolls are reasonably uniform in size, the number of rolls may be multiplied by the weight of the average roll obtained by weighing 20 per cent of the rolls of the shipment as hereinafter described.

Weighing should be made only on such scales as have been recently checked by a recognized sealer of weights and measures or the accuracy of which has been satisfactorily determined by the analyst in charge of the test.

Determination of Moisture Content of Shipment.

Pulp purchasers should ascertain at the time that the contract is made, especially in the matter of long contract, the exact method used at the pulp mill for the estimation of the moisture in the particular pulp in question, and, if possible, that the same method should be used in testing the pulp at the time of receipt.

For pulp purchases made in the open market, or in other cases where no agreement has been made as to the matter of method of sampling, the methods hereinafter described are recommended.

Procedure in Case of a Discrepancy.

In the case of a discrepancy between the weight as given on the invoice and as found by the consignee, the following procedure is recommended:

Pulp should always be so stored that each car lot forms a distinct separate pile and no pulp should be used until it is ascertained that the air-dry content as found by the test checks that of the invoice. In case of any considerable discrepancy, the matter should be reported as soon as possible and a retest made by such official tester as shall be agreed upon between the two parties to the contract. Only such claims for shortage should be considered as are made sufficiently promptly to enable the official analyst agreed upon for retest work to weigh and cut samples within ten days of the time of unloading the pulp and when any delay beyond the ten days specified is not the fault of the purchaser. The method to be followed by such official analyst should be such an one of the methods hereinafter described as shall be acceptable to the two parties to the contract.

Procedure in the Case of Reweighing.

In the event of it being necessary to reweigh stored pulp by an official tester or analyst, the following procedure is recommended:

Before proceeding to the weighing of a shipment of pulp in storage, the analyst should ascertain that not less than half of the parcel in question is available for such retest.

The procedure to be followed in this case should be one of the following methods and the choice of method should be regulated by the kind of pulp under consideration.

Baled Pulp.—Ten percent of the entire number of bales in the shipment, but not less than ten bales, such bales being sound and intact, should be weighed, and from the average weight of these bales, the weight of the shipment should be calculated.

As an optional method, the entire shipment may be reweighed, and this is recommended in cases where the individual bale weights vary widely.

Roll Pulp.—The entire shipment of rolls should be reweighed, if available. If this is not possible, then 20 percent of the rolls should be reweighed, such rolls being all sound and intact and as nearly the average size of roll as possible. From the total weight of these rolls, the weight of the entire shipment should be calculated.

Hydraulic Pressed Laps.—(1) If such laps are received tied in bales, and the individual weights of such bales are fairly uniform, then it is sufficient to reweigh 10 percent of the bales of the shipment and, from the average bale weight thus obtained, calculate the weight of the entire shipment.

As an optional method, the entire shipment may be reweighed, but this is only recommended in cases where the individual bale weights vary widely.

(2) If such laps are received tied in bundles or packages, the number of said bundles or packages being stated in the invoice, and the individual weights of such bundles or packages being fairly uniform, then it is sufficient to reweigh 10 percent of such bundles or packages and from the average bale weight thus obtained calculate the weight of the entire shipment.

As an optional method, the entire shipment may be reweighed.

(3) If such laps are received tied in bundles or packages, the number of which is **not** stated on the invoice, or if the individual weights of such bundles or pack-

* Suggestions submitted for consideration by the Technical Association of the Pulp & Paper Industry. See also article in Pulp and Paper Magazine, May 26, 1921.

ages vary widely, or if the shipment consists of an indefinite number of loose laps, then the entire shipment should be reweighed. In making such reweighing the analyst must accept the statement of the consignee that the pulp weighed is the **entire** shipment in question.

Unpressed Laps.—The same considerations should apply as in the case of hydraulic pressed laps, described above.

Procedure for the Taking of Samples.

In taking samples for the estimation of the moisture content of pulp shipments while unloading or from storage the procedure to be followed should be one of the following methods, and the choice of method should be regulated by the kind of pulp under consideration.

Baled Sheet Pulp, Domestic or Foreign.—The method recommended is essentially that which has been adopted by the American Paper and Pulp Association and the Association of Woodpulp Importers and is now in general use.

Ten percent of the entire shipment, but not less than ten bales should be sampled. If the gross weight is to be arrived at by a calculation from the average weight of the bales which are sampled, then only sound and intact bales should be taken for sampling, and these should be chosen from the different sections of the shipment and the analyst should be careful to observe that no unusual conditions prevail in the selection of the bales. If the entire shipment is to be reweighed at the time of sampling, then such bales should be chosen for sampling as will, in the careful judgment of the analyst, most nearly represent the tenth of **all** the bales of the shipment, whether damaged or intact. These bales may be conveniently chosen by taking every tenth bale handled during the loading or unloading. If, in the best judgment of the analyst, the tenth bale is not representative and should not be chosen, then the ninth or the eleventh bale or the bale nearest to the tenth which is representative should be chosen. The accurate weight of all bales sampled should be ascertained before sampling and no other bales than those weighed should be sampled and, whenever bales are numbered or marked, the number and mark should be given on the report, togther with the weights obtained.

The samples should be taken by boring into the bale to a depth of three inches with a special auger which cuts a disk about four inches in diameter. The holes which are bored should be so located that in five successive bales they represent a portion extending diagonally across the bale. Each bale to be bored but once. The first hole to be bored at the corner, the edge of the cut being at a distance of one inch from the edge of the bale. The second cut should then be made half way between the center and the corner of the bale, the third cut should be at the center of the bale, the fourth cut should be opposite the second cut, half way between the center and the center and the corner of the bale, and the fifth cut in the opposite corner in a position corresponding to the first bore.

Ten of these disks should be chosen from each cut as follows:

1 disk 2nd sheet from the wrapper.
2 disks 1 inch deep.
3 disks 2 inches deep.
4 disks 3 inches deep or from the bottom of the cut.

Roll Pulp—Twenty per cent of the entire shipment, but not less than twenty rolls should be sampled. These rolls should be chosen as to represent as nearly as possible an equal number of rolls from the left-hand deckle edge reel, the right-hand deckle edge reel, and each of the center reels of the entire machine roll. This is essential for correct work since the moisture in the various reels coming from the same machine at the same time has been shown to vary by as much as 8 per cent.

If the gross weight is to be arrived at by a calculation from the average weight of the rolls which are sampled, then only sound and intact rolls, whose size is as near the average size as is possible, should be taken for sampling, and these should be chosen from the different sections of the shipment with the same care as is recommended in the case of baled pulp. If the entire shipment is to be reweighed at the time of shipment, then such rolls should be chosen for sampling as will, in the careful judgment of the analyst, most nearly represent 20 percent of all the rolls of the shipment, whether damaged or intact. The accurate weight of all rolls sampled should be ascertained before sampling, and the average roll weight obtained from the weight of the rolls which are sampled should approximate closely that arrived at by the reweighing of the entire shipment.

Rolls should be sampled by one of the two following methods:

(1) **The Disk Method for Roll Pulp**—The samples should be taken with the same cutter as is used in the case of baled pulp. The holes which are bored should be so located that an equal number will have been taken from each position with reference to the drying machine. One-third of the reels from the left deckle edge of the machine should be bored at the center of the reel, one-third 3 inches from the deckle edge and one-third 3 inches from the cut edge. The same rule for location of cut should be followed in boring the reels from the right deckle edge of the machine and the center reels without deckle edge.

The hole bored should be 3 inches deep and five disks should be chosen from each cut as follows:

1 disk 2nd from the wrapper.
1 disk 1 inch deep.
1 disk 2 inches deep.
2 disks 3 inches deep or from the bottom of the cut.

If the weight is to be accepted as invoiced and moisture only is to be checked, then the disks should be bored as above, but the five disks should be chosen from the bottom of the cut. (At this distance from the surface the moisture content would scarcely vary from the amount as the pulp left the machine. If the pulp is reweighed, the sampling must take account of possible change in moisture due to greater exposure of outer layers.—Ed.).

(2) **The Strip Method for Roll Pulp**—The Rolls which have been chosen for sampling should be cut cut from end to end to a depth of three inches and five of the sheets so formed should be chosen as follows:

1 sheet 2nd from the wrapper.
1 sheet at a depth of 1 inch.
1 sheet at a depth of 2 inches.
2 sheets at a depth of 3 inches.

From each of these sheets a strip 1½ inches wide and extending the full length of the roll should be cut and preserved for sampling. The width of strip may vary from 1 to 3 inches, but all strips of the same sample should be approximately the same width. (If rolls are tested for moisture only, all 5 sheets should be from the 3 inch depth. See above.—Ed.).

Lap Pulp, Hydraulic-Pressed—(1) If such laps are baled, then 10 per cent of the number of bales should be chosen for sampling. If the entire shipment is to be weighed at the time of sampling, then the bales for sampling should be so chosen as to most nearly represent the condition of the entire shipment, that is, if any unusual condition prevails in a portion of the shipment, such as a wetting of one end of the car, or an unusual amount of drying out of the top layer or near the door of the car, then the same proportion of the bales intended for sampling should be chosen from these abnormal bales as exist in the car. If the gross weight is to be calculated from the average weight of the 10 per cent of the bales which are chosen for weighing and sampling, then only such bales should be chosen as are sound and intact and which, in the judgment of the analyst, have not been subjected to any abnormal condition during transportation.

The accurate weight of all bales to be sampled should be ascertained, after which the bales should be broken open and such a number of laps chosen as will give a total of not less than thirty laps and not more than forty laps. If only one lap is to be chosen from each bale, then from the first bale the outside lap is to be chosen, from the second bale the second lap, from the third bale the third lap, etc. If two laps are to be chosen from each bale, then from the first bale the first and second laps should be chosen, from the second bale the third and fourth laps, from the third bale the fifth and sixth laps, etc.

(2) If such laps are tied in packages or small bundles, then not less than thirty nor more than forty such packages or bundles should be chosen from all parts of the car and one lap should be chosen from each such package or bundle.

(3) If such laps are piled loosely in the car, then not less than thirty laps nor more than forty laps should be chosen from different portions of the car. This may be very conveniently done by choosing one or two laps from each truckload of laps as the pulp is being unloaded.

The laps which are chosen for test should be sampled by one of the two following methods. In either case the depth of the cut should be half way through the lap.

The Strip Method for Hydraulic-Pressed Lap Pulp—The strip method is in use in a large number of mills making hydraulic-pressed pulp and, therefore, should be used in the testing of all pulps from such mills. The strip method is approximately correct if applied as follows:

One strip should be cut from each lap, one third of the number from the center of the wet edge and perpendicular to that edge and two-thirds of the number from the center of the end of the lap and perpendicular to that edge. The strips should be two inches wide and of such a length that the sample shall represent the same proportion of relatively wet edge and and of relatively dry center of the lap as is found in the average lap of the shipment. The length of each strip should be accurately measured and the width of all strips in the same sample should be approximately the same.

Example. If the laps average 20 x 30 inches in size and the average width of the unpressed lap edge is 3 inches, then each strip cut should be 9.4 inches long. If such strips are cut one inch too long or one inch too short, the sample may contain as much as 2 percent more or less dry pulp than is found in the entire lap.

The Wedge Method for Hydraulic-Pressed Laps.—The modification of the original Woodruff method, as proposed by F. M. Williams, seems to be reasonably correct in theory and more convenient than the original method and, therefore, this modified method may be used where the wedge method is desired.

This wedge should be 2½ inches wide at the edge of the lap and should extend to a point in the exact center of the lap. One wedge should be cut from each lap. One-fourth of the number of wedges should be cut from the middle of the dry edge of the lap to the center, one-fourth of the wedges from the middle of the wet edge of the lap to the center, and one-half of the wedges from the midde of the end of the lap to the center. It is important that these wedges be cut accurately, using a measure in each case, and that the point of the wedge be not lost in removing the sample from the cut. A variation of one inch in the total length of the wedge will cause an alteration of the total moisture found in the sample of from 1 to 2 percent.

Lap Pulp, Unpressed.—Forty laps should be chosen for sampling. If the sampling is done at the time of loading or unloading, then it is convenient to choose one or more laps from each truck load, but if any abnormal condition exists, such as an excessive drying out of the top layer or near the door, or a wet end of the car, then the same proportion of laps should be chosen from these abnormal laps as exist in the car. If the sampling is done on pulp which is already in storage then no lap should be chosen which is not covered by at least four other laps and so surrounded that the edges have not had the opportunity to dry out, and the laps chosen should be as thoroughly distributed throughout the pile as is possible.

For this kind of pulp the strip method is recommended exclusively. These laps are made on a wet machine and moisture variations are largely due to differences in the pressure of the roll across the sheet; therefore, the scientific and practical method of sampling this pulp, both at the pulp mill and at the paper mill, is by taking a strip across the lap in the machine direction.

Strips should always be cut across the lap from deckle to deckle and, in sampling at the receiving station, may be sampled by the cutting of inch-wide strips from the folded lap, or the lap may be spread open before cutting, at the convenience of the analyst. (From deckle to deckle is **not** in the machine direction.—Ed.)

Procedure for the Handling of Pulp Samples After Cutting Them.

Samples should be deposited, immediately after cutting, in a metal can with a tight-fitting cover and the net weight should be obtained as soon as practicable after the taking of the samples. In the case of an unavoidable delay between the time of taking the samples and of weighing, a special precaution should be taken to seal the edges of the cover with friction tape or otherwise.

The scales used for weighing pulp samples should show a decided deflection by the addition of 1 gram or .03 ounce and two weighings of the same article taken at different times should not vary by more than that amount and the sensitivity of the scale should not be decreased below that amount when carrying the maximum load of pulp.

After the wet weight of samples has been ascertained, samples should be placed in a suitable oven and dried at a temperature as near 212° Fahr. as possible until

two consecutive weighings, taken not less than four hours apart, do not differ by more than 3 grams or 0·1 ounce, and the minimum of these weights should then be taken as the bone-dry weight of the sample. The entire bulk of the sample selected from the pulp should be dried out for the test. The temperature in the drying oven should not exceed 220 deg. Fahr., nor, except when containing wet pulp, be less than 204 deg. Fahr. No wet pulp should be put in the oven in the four-hour interval between the two final weighings of a lot of pulp already in that oven, nor should there be any other source of excessive moisture in the air passing through the oven just prior to the final weighing of a sample of pulp. All bone-dry weighings should be made as rapidly as possible after the removal of the pulp from the oven and before the pulp has had an opportunity to absorb moisture from the surrounding air.

Calculation of the Air-Dry Content of a Pulp Shipment.

The bone-dry weight of a pulp shipment is considered as 90 per cent of that of the air-dry weight. Therefore, in order to arrive at the air-dry content of a pulp shipment, the percent of bone-dry pulp found in a sample should be multiplied by 10/9th, then by the gross weight of the shipment.

Considerations Involved.

The following points have been considered in formulating the foregoing rules for the estimation of the air-dry content of wood pulp shipments:

1. The careful and continuous checking of the weight and moisture as given on every invoice of pulp shipment is especially urged upon all pulp buyers as a means of stimulating greater care in the obtaining of the invoice figures.

2. The proper time for a pulp buyer to take up the matter of a moisture test method to be used on a particular grade of pulp is at the time that the contract is made. Even though the buyer understands that the method used at the pulp mill is not theoretically correct if the pulp is purchased with the understanding that such a method is in use at the pulp mill, then the pulp should be tested at the receiving mill by the same method as that used at the pulp mill. If the same method is used at the pulp mill and at the receiving mill and the manipulative details are accurately followed in both tests, the buyer, can feel justified in making claim for a variation of more than 2 percent in the air-dry content of the shipment.

3. In the recognized method for the sampling of baled pulp, the instructions are that not less than 5 percent nor more than 10 percent of the bales should be sampled. In matters of controversy, the request for the reweighing of 10 percent of the bales has been so general that in these recommendations the minimum of 5 percent has been omitted. Baled shipments usually contain 180 to 350 bales to a car, so the sampling of 10 percent of the bales is not an excessive hardship in any case.

4. In the retesting of stored, baled pulp, analysis are frequently requested to reweigh the entire shipment and retest 10 percent of the bales. However, the gross weight as calculated from the weight of the 10 percent of the bales chosen for sampling usually checks reasonably closely the gross weight obtained by reweighing the whole shipment. In the rehandling, bales are frequently damaged and if the whole shipment is reweighed, a portion of these damaged bales must be sampled. For this reason, the recommendations strongly favor the reweighing of only the 10 percent of sound and intact bales which are to be sampled.

In the retesting of stored roll pulp, the recommendations favor the reweighing of the entire shipment where possible, since these rolls usually vary widely in weight and it is not possible to obtain an average roll weight by the weighing of a small number of rolls. If the whole number of rolls in the shipment is not available, then 20 percent should be weighed in order to obtain the average roll weight.

5. Roll pulp is run on a drying machine which is from two to five rolls wide and is usually tested at the pulp mill by taking at regular intervals a strip the full width of the machine from deckle edge to deckle edge. For this reason the scientific method of sampling such pulp at the receiving mill is by choosing for sampling such proportion of right deckle rolls, left deckle rolls (as determined by the direction in which the pulp is rolled) and non-deckle edge rolls as will represent an even number of rolls from each portion of the machine and sampling each roll by cutting strips the full length of the roll. However, the carrying out of this method at a receiving mill especially with a pulp which is already in storage or one made on a drying machine which is four or five rolls wide, is looked upon as complicated and introducing more error in manipulation than would result from a simpler method. For this reason, the usual method for sampling roll pulp is by boring disks from the rolls selected at random from the shipment. While the results of this method have been so frequently criticised that we have suggested the more laborious method of choosing the rolls for sampling according to position on the drying machine, we are of the opinion that if 20 percent of the rolls, representing equally all portions of the shipment, are chosen without consideration of position on drying machine, results are usually satisfactory.

6. In the matter of the disk method of sampling roll pulp, so far as is known to the writers of these recommendations, no research has been done which would assist in determining the exact position on the roll at which the two end borings should be made. Instructions in use locally vary from one inch from the end to six inches from the end. Therefore, in the recommendations, the arbitrary distance of three inches has been fixed.

7. In the matter of hydraulic-pressed laps, there seems to be no question but that Mr. Woodruff thoroughly analyzed the condition of these laps and proposed the only really scientific method which has been submitted for sampling. The moisture content of the strip sample as usually taken bears no relation to the moisture content of the entire lap and usually favors the pulp seller. Some pulp mills are taking wedge samples, but so incorrectly that it is no improvement except in name. One pulp mill, at least, is following carefully the Woodruff method of sampling. The seeming difficulty in the marking out of the wedges appears to discourage the average man doing routine pulp testing and for that reason, although the Woodruff wedge method is the most correct method which has been suggested and has been discussed for several years, it has not met with very general favor as a regular practice. For this reason only, it is omitted from the recommendations and in its place are two, approximately correct, but simpler methods. The error in the strip method as proposed is that it assumes that the whole portion of the lap which has been under the press is equally wet, which is not true, especially with laps which have been stored for some days between the time of pressing and of testing. The error in the Williams modified wedge method is that it assumes that the moisture content of the center of the wet edge is the same as that of the corners of the lap which is probably not true. However, the error in either of these cases is probably not appreciable.

8. Some pulps are shipped on skids and for this kind of shipments a method should be adopted, but the writers are not prepared to make recommendations for skid pulp.

RAPID GROWTH OF TIMBER FOR PAPER MILLS.

An intensive survey of Canadian timber lands, by Edward F. McCarthy, one of America's best known foresters and forest investigators, has shown that surprising crops can be secured from cut over pulp wood land by proper handling.

An address before American foresters, attending the annual convention of the Woodlands Section of the American Paper and Pulp Association, told of his investigations on a 19,000 acre tract of timber land. He showed that there is a startlingly rapid growth of new timber on cut over pulp wood lands of mixed hard and soft woods, when protected from fire.

Mr. McCarthy was the first forester on the faculty of the New York State College of Forestry at Syracuse, but left New York State to make a series of investigations of Canadian forests for the Canadian Commission of Conservation.

Mr. McCarthy's investigations showed that ten years after an original cut of 2.9 cords per acre on virgin mixed timber in the Canadian region, there was a stand of 4 cords, and at the rate of growth maintained in the last ten years, in another ten there will be 6¼ cords per acre, and 7.6 cords in 15 years. His investigations, however, showed a serious mortality due largely to insects.

Forestry in Sweden — Part 4

By EDWARD BECK, Publicity Department, Canadian Pulp and Paper Association.

"Yes, Sweden will have some worth while forests in fifty or one hundred years," admitted Baron Mannerheim, head of the Kramfors Company in Stockholm, one of the largest lumber, pulp and paper concerns in Sweden and among the largest owners of private forests, in reply to a complimentary remark on the condition of Sweden's forests. The Baron knows Canada. He made an extended visit there a year or so ago. He saw much to admire in the industrial development of the Dominion. He thinks, however, that we are not very far advanced in the administration of our forests. "You ought to make indiscriminate cutting impossible," he said. "You ought to pass laws against it. In the long run, the companies over there would find it to their general advantage as well as to the country's general good."

The Baron is himself an ardent believer in reforestation and has done much for its promotion in Sweden. His own forestry department, under his inspiration, is probably the most progressive of any in the country, and is much farther advanced than any other. The personnel of his foresters is exceptionally high.

I don't know how old the Baron is. If called upon to guess I should say somewhere in the sixties. In all probability he will not be living fifty years hence to see the fruits of his efforts to improve Sweden's forests; certainly not to see them as they will appear after the lapse of another century. Nevertheless, his modest admission is not only typical of his own disinterested regard for the forests, but is characteristic alike of the Swedish national attitude towards the subject of forestry in general. Everybody is looking forward to and working for the future. There is not the slightest danger of Sweden ever becoming a forest bankrupt; or that the Swedish forests will ever be exhausted for the sake of producing immediate profits, however great the temptation.

That is not to say, however, that Sweden does not now possess fine forests in abundance, or that these forests are not now being utilized to the limit of prudence and to the full extent of the demands made upon them by Sweden's constantly increasing export trade in lumber, pulp, paper and other forest products as well as to supply all of the domestic requirements of these commodities.

After a thorough and painstaking inspection of several government forests and four extensive private forests, including those owned by the Mo Domsjo Company, the largest private forests in Sweden, the Holmens Bruks Company, the Kramfors Company, the Fiskeby Paper Company, as well as of forests owned by communities and by farmers, one is most impressed with the fact that in Sweden the forests are farmed. They are cultivated with all the care and assiduity that is given to the cultivation of the wheat lands in the Canadian Northwest or to the sugar plantations in the Southern States. The result obtained is a permanent, constant and ascertainable current yield and an assurance that, barring accidents, this yield will continue indefinitely and in increased volume for all time to come.

Not all Swedish foresters agree as to the superiority of any given method of reforestation, but none are allowing their forests to go uncultivated. Planting and seeding follow cutting almost invariably. Experiments are in progress to ascertain how to obtain a maximum yield in the shortest period of time. Drainage is resorted to to improve the soil. In the Mo Domsjo forests more than 6,000 miles of ditches have been constructed to this end, at large cost but with highly gratifying results. Most of the companies maintain private nurseries in which to develop the plants. Some of them are putting out two million and upwards of seedlings every year. Hardly any land is permitted to go uncultivated for more than three years after being cut over, the interval being allowed merely to permit the soil to recuperate itself and to get in readiness for a new growth. Seeding is carried on by means of horse-drawn mechanical seeders of plow-like appearance. Pine and spruce are usually sown in conjunction, an equal quantity of each species of seed being dropped into the ground together. Boys and girls and young women, as well as men, are employed in the planting and seeding operations, the object being to reduce the labor cost to the minimum.

Re-planting is admittedly a costly operation, especially when the interest on the capital investment is taken into account. But here they do not consider the question of compound interest on the capital which is the bugbear of reforestation in Canada. Each year's operations are looked upon from a bookkeeping point of view as a unit. Cost is calculated on that basis. Swedish forest experts are not all convinced, however, of the efficacy or the economic value of artificial replanting, although evidences of its practical results are by no means wanting. Southern Sweden possesses some fine examples of man-planted forests, which are from fifty to sixty years old. They are now ready for their first thinning and will yield a very satisfactory harvest. In some of them the trees are planted at regular intervals of six feet in either direction. They are mostly pine and spruce. They are fine upstanding trees and present a uniform appearance of almost military precision. There are a few cultivated forests older than those described but systematic efforts at replanting seem to have had their beginning much less than fifty years ago.

In Northern Sweden apparently no efforts were made to propagate forests in any large way up to fifteen years ago. Since that time planting and seeding have become very general. Everywhere one finds plantations of from five to fifteen years of age giving signs of healthy and vigorous growth and promising extensive crops of mature trees in due time. In many of these plantations, foresters tell us their plantings yield 95 per cent of helathy trees.

As in Canada, so in Sweden, there are two schools of foresters. One believes in leaving to Nature most of the work of replanting the forests and of rendering only such assistance as may seem to be actually necessary. The other believes that the best results are to be obtained in every case by artificial cultivation. With the former, financial considerations frequently prevail. "What's the use of spending money to do something which Nature will do alone and do much better if it is left to her to do?" they

say. They also assert that artificial propagation impairs the stamina of the trees and involves risks of early losses which are avoided when Nature does the work.

Mr. Carl Eric Barth, chief forester for the Fiskby Paper Company, is one of those who believe in giving Nature every chance to replant the forests. In his woods near Finspong he shows some interesting results obtained from strip-cutting, as it is called. This involves the clean cutting of a strip about 1,000 feet wide and two or three times as long with the standing forests on both sides. Seeds from the standing trees are scattered by the wind over the clean-cut area and in time take root and develop into trees. Plots so cut in the Finspong woods show a proficient growth after three years. On some plots cut over about seven years ago there is a fine growth of young trees which give a promise of developing into excellent stands of pine and spruce. Mr. Barth is very enthusiastic for this method of cutting and has prepared an elaborate report showing its results for presentation to the Swedish Forestry Association which, in conjunction with a number of Norwegian foresters, is to visit his woods this summer.

Forestermaster Isaac Ljungquist of the Holmen Bruks Company is also strong for the natural method of reforestation and has many spots in his woods to prove what can be done in this way. He is opposed to spending money on nurseries and on planting and seeding unless it can be shown that such expenditures are vitally necessary. He admits that there are circumstances which can only be met by artificial means and he doesn't neglect to seed or plant his land when natural means are not available.

But the success of Sweden's forests, it is very evident, depends less upon the methods employed for securing a new growth of trees than it does upon the scientific means employed in harvesting the current crop. In America, and to some extent in Canada, forests are cut down on the principle of securing the greatest yield of wood for the smallest outlay of money. In Sweden, both in theory and practice, the main object sought in cutting seems to be to obtain the maximum yield of wood compatible with the least injury to the standing forests. There is all the difference between scientific and unscientific forestry in the two principles. The first consideration given to logging in Sweden is how to cut in such a manner as insure an increased growth to the remaining forest. With the exception of the "strip-cutting" methods above referred to and which is by no means universally employed, there is little or no clean-cutting. Trees are taken out by selection, either because they have reached their maximum growth and consequent yield or to ensure a better opportunity to those left standing by improved light, ventilation and sunshine. Enough birch is usually left to afford protection to the growing pine and spruce. Attention is given to crop rotation. The soil is studied as to its fitness for the species to be grown on it. Drainage is resorted to wherever necessary. Where clean-cutting is indulged in it is made in selected spots and these spots are replanted or seeded with the least possible delay.

In every direction the forests show the effect of the good care they receive. Barren spots are very scarce. There is very little underbrush to obstruct the view or make travel through the forests arduous. Most of the forests present the appearance of cultivated park areas. Large groups of trees, especially pines and spruces, grow uniformly in heighth and girth. There are few crooked, stunted or dwarf growths, defective trees being the first to yield to the woodman's axe. After a cutting the minor branches are left on the ground to afford protection to the seedlings and contribute to the fertility of the soil, but debris-strewn forests are unknown.

To sum up, it may be said that while intensive forestry in Sweden may not have reached the degree of development attained in Germany or in France it is beyond criticism in its employment of those methods of cutting best designed to obtaining the greatest possible yield of timber and at the same time facilitate as much as possible the best natural reproduction, and that in accommodating the adaptability of the species employed to the varying conditions of the country, in efficient fire protection, in counteractng the influences of forests insects and diseases and in its economical utilization of the forest yield in industrial operations, Sweden ranks second to no other country.

RATES OF PAY PROPOSED BY THE INTERNATIONAL PAPER COMPANY.

The Digester gives the following list of the rates which the International Paper Company, operating more than twenty mils in the United States and Canada, has asked their men to accept as a basis for terminating their strike and returning to work.

	Rates per hour	Hours per day	Daily Wages
Wood Department:			
Boom Gang	39c	8	$3.12
Conveyor Men	38c	8	3.04
Barker Men	42c	8	3.36
Splitter Men	42c	8	3.36
Wood Handlers	38c	8	3.04
Chipper Men	43c	8	3.44
Groundwood Department:			
Wood Handlers	41c	8	$3.28
Sliver Screen Men	41c	8	3.28
Grinder Men	48c	8	3.84
Stone Sharpeners	49c	8	3.92
Screen Tenders	48c	8	3.84
Decker Men	46c	8	3.68
Sulphite Department:			
Tower Men	38c	8	$3.04
Sulphur Burners	46c	8	3.68
Cooks	64c	8	5.12
1st Helpers	53c	8	4.24
2nd Helpers	47c	8	3.76
Blow Pit Men	47c	8	3.76
Screen Tenders	48c	8	3.84
Wet Machine Tenders	46c	8	3.68
Paper Mill:			
Beater Men	40c	8	$3.20
Mixer Men	49c	8	3.92
Machine Tenders	88c*	8	7.04
Back Tenders	72c*	8	5.76
Third Hands	59c*	8	4.72
Fourth Hands	46c	8	3.68
Roll Finishers	44c	8	3.52
Weighers	48c	8	3.84
Markers	44c	8	3.52

* Highest rate paid.

Box Makers' Association Worth While

By S. J. FRAME, Secretary Treasurer.

I would report that the financial statement for the year ending May 31st, 1920, has been duly audited by Mr. W. P. Bennett, Honorary Auditor.

The Association has at present 47 active members and 41 associate members, this being a net increase of one in the active membership and a decrease of six in the associate membership. When last year the Association increased the fees, a decrease in the associate membership was anticipated to an extent greater than what has actually taken place.

The Association now again starts on a new year.

The year just closed has been an active one for the Association, it having during the year again demonstrated its usefulness by taking up numerous matters affecting the Canadian Paper Box industry, some of the more prominent matters which have been dealt with being, —

Conference with the Board mills last Fall in respect to prices and subsequent conferences with them towards increasing the uses of Paper Boxes.

Establishment of average standards of time in connection with the manufacture of Shoe Box, 1-lb. Candy Box and For Folding Box plants.

Great credit is due to the President, Vice-President, Advisory Committee, and other Committtees for the amount of time and effort which they have all cheerfully given, in the Association's interest.

Consistent with its slogan "Advance", in keeping with the dignity of the Association and the prestige of the Canadian Paper Box industry, the Association, during the year just ended, has been incorporated by the Dominion Government.

The Incorporation is in conformity with the fact that for some considerable time past, when the Dominion Government, Ontario Government, or other public bodies have desired information on the Canadian Paper Box industry, the Canadian Paper Box Manufacturers' Association has been recognized as the headquarters of the industry.

That live organization, the Toronto Carton Club continues actively in existence, holding luncheon meetings twice monthly, and doing excellent work towards stabilizing conditions in Toronto during the present dull time.

Respecting trade conditions, I observe that in my report of a year ago I referred to the shortage of board which was incidental to the world wide shortage of raw material then prevailing. Since then the situation has altogether changed, and instead of a scarcity, there is abundance, not only of materials, but of labor, and instead of a seller's it is now a buyer's market.

The change in the situation is not by chance, but from the workings of unchangeable economic laws, which govern, and notwithstanding artificial conditions arising from time to time, assert themselves in the long run.

The process of adjustment now taking its course is going on as satisfactorily as could be expected. A number of lines are now below their 1913 level and may increase in price. Other lines have probably not been reduced sufficiently to reach their true level. Therefore, speaking of commodities generally, prices are out of alignment, but indications point to the downward movement in a violent sense having been arrested, or to a very great extent at least.

It can therefore be said that considerable progress has been made towards the goal of stabilizing of prices which has to be reached before buyers will be inspired with confidence to buy freely.

There is still considerable smoothing out to be done of labor costs, following the reduction in food and manufactured goods, before the construction of buildings, which this continent is most in need of at the present time, can be commenced on a large scale. When that point arrives, and the indications are that it will come towards the end of this year or early next year, another period of prosperity can be looked for.

In the meantime, the Paper Box Industry, in company with many other industries, is finding trade conditions very dull and orders scarce. In view of such conditions, the Toronto Carton Club has during the year 1921 taken up from various standpoints — and with beneficial results — the question "How can we make the best of and improve present quiet conditions in the Paper Box industry?"

Bearing on the above question, the following thoughts occur to me,—

The present times call for the quality and steadfastness to the greatest degree, and to a far greater extent than in the last few years.

In the keenness of competition, manufacturers need to guard against their minds becoming obsessed with what their competitors are doing. In this respect, I would quote from a paper read by me under date February 24th, at a luncheon of the Toronto Carton Club,—

"A great part of the world's troubles come through ignorance, and ignorance is the greatest cause of cutting of prices. Ignorance of what your competitor is actually doing.

It is generally known that it is not uncommon to find Ananiases among the buyers, yet how often is the word of the buyer accepted without taking the trouble to get the facts from your competitor.

Another point always to be remembered is that while on a competitive job, a number may be bidding, only one usually gets it. When you do not get the job, take it coolly. Do not assume that your competitor has cut the price. Do not, because the buyer tells you your price is high, go back and refigure a ridiculously low price just to find out whether it will get the job, or to spite the other fellow. Discount that feeling which seems to be so common among salesmen, that the buyer is a friend of yours, and that on even terms you will get the business. You may think he is a friend of yours, whereas he may be only using you to check up the figures of someone else to whom he intends to give the preference.

The successful bidder may originally have quoted higher than you, and having the preference, has been permitted to meet your figures as you slid down."

I therefore emphasize the point not to be too

anxious about any particular job. If you cannot get it by legitimate methods, drop it and go on to something else. One swallow does not make a Summer. One job will not make or break your business."

Coming back to the question "How can we make the best of and improve present quiet conditions in the Paper Box industry?" The answer does not lie in watching your competitor and worrying over what he is doing or what you imagine he is doing. Nor does it lie in wild cutting of prices to stimulate business, as instead of stimulating, it will only result in the buyer holding further back.

"And why beholdest thou the mote that is in thy brother's eye, but considerest not the beam that is in thine own eye?"

Is not the answer to be found in the direction of improvement in one's own methods in Factory, Office or Sales Departments; towards manufacturing economically, giving of better service, and finding new uses for Paper Boxes?

Coupled with a wide sense of vision which will view matters in the true perspective, recognizing that present conditions are but temporary, the Paper Box manufacturer in following such a line of policy will not have time to worry about his competitor, and when normal conditions arrive, the Canadian Paper Box industry will be at the high standard aimed at in the following objects, which I quote from the objects of the Association.

"To raise the general standard of efficiency of those in the business, whereby the capital involved shall have a proper return thereon, the management shall be adequately rewarded, the wages paid and factory conditions shall be such as to attract a good class of labor, and to improve the quality of the product turned out."

PAPER BOX FACTORY FOR EDMONTON.

Through the efforts of the board of trade a new industry has been secured for Edmonton, Alta. The National Paper Box and Carton Co. with a main factory at Vancouver and a branch at Victoria have arranged for the Henningsen Dye Works building on 110A Avenue, and are rapidly putting the building in shape. A complete line of knock-down and set-up boxes will be manufactured, including a line of fancy candy boxes. The fibre board and other raw material will all be purchased in Canada, most of the material coming from the eastern provinces. About 50 people will be employed at the start.

CHICOUTIMI REFORESTING.

An extensive plan of reforesting its timber limits has been decided upon by the Chicoutimi Pulp Company. The company has obtained the services of the Quebec Forestry Department to make a complete survey of its timber reserves, and the best method of their exploitation. The outline of the project has already been adopted and the company has lately sent one of its employees to Europe, where he will study European methods on the ground and consult with the best-known practitioners in this field.

Mr. G. H. Mead, president, and Mr. P. B. Wilson, vice-president of the Spanish River Pulp and Paper Mills, were in Montreal last week. Another visitor was Mr. Angus McLean of the Bathurst Co.

THE HALF-TONE AND ITS WHIMS.

(From Special Bulletin No. 3, of the Canadian Pulp and Paper Association.)

You recall what the cynic said about women? That you can't live with 'em, and you can't live without 'em. If that is true half-tones must be feminine. We cannot well do without half-tones, but no printer has been able to live with them for any length of time without shattering the Fourth Commandment into ten thousand quivering fragments of explosive English.

Half-tones are as full of unexpected "kicks" as a jug of home-brew. Even with the most careful make-ready and the best of ink, the results are sometimes enough to make a conscientious printer weep and the customer rave.

"Unsuitable stock," says the foreman of one of the largest pressrooms in Canada, "is the most frequent cause of poor results when printing from halftones. This doesn't necessarily mean poor stock. The stock must be suited to the cut, if you want a satisfactory job. Of course, it isn't necessary to tell a printer that he can't use a 133-line-screen half-tone on newsprint or that a 120-line screen is usually best for general work.

"But to get the best results—plenty of detail and high-lights—we have to use ink that suits the cut. Different half-tones require different inks, and if the sizing of the paper isn't evenly laid and well brushed, the stock won't take ink of sufficient body to bring out the tones to the best advantage. Then we get a weak and washy half-tone."

The proper stock being chosen, the pressman has an opportunity to show his skill when he prepares his make-ready. Overlays must be carefully cut and placed so as to secure a deep, rich tone in the shadows, and clear, unsullied high-lights. The middle tones must be built up with overlays of various thicknesses to bring out all the values of the cut.

When soft tones and a wealth of detail are desired, it is well to use a screen as fine as 166-line. This, however, demands the highest-grade stock and printing under the very best conditions. 133-line is fine enough for good magazine and commercial work, while for use in the general run of catalogues and for trade-paper ads, it is unwise to attempt anything finer than 120-line. 60-line is best for newspaper work. If the 60-line screen is too fine for the stock specified, it is best to use line cuts rather than half-tones.

Whatever screen is used, it is well to remember, when selecting stock, that there is paper made in Canada to suit every requirement. Whether the job is the finest book work or a moderate-priced envelope stuffer, you need not go outside Canada to find a suitable stock.

Should you be uncertain as to just what stock to use on any particular job, look through the sample-books of any dealer in Canadian-made papers. If there's no sample-book handy, call up or write to your nearest dealer. He can give you better service than any foreign maker, and as for quality—prove to yourself through actual use that there is no better paper on the market than that made right here in Canada.

The concrete has been poured for the turbine for number seven unit in the Laurentide powerhouse and the generator foundation ring has been set. The number seven generator is expected in a couple of weeks. Parts for number eight unit are beginning to arrive, but none of the big sections have put in an appearance.

UNITED STATES NOTES

With the completion of one of five large units projected for the plant of the Waterway Paper Products Company, an Illinois Corporation, Chicago will soon see its first paper mill in operation. The cost of each of the four units remaining to be built will be close to a million dollars. The plant as it stands at the present time represents an outlay thus far of over $700,000. A 132-inch Black-Clawson Fourdrinier machine of latest type has been delivered at the plant. Walter A. Strong, who is associated with the Chicago *Daily News*, heads the company as president and general manager, and Emmanuel M. Mendelsohn will be vice president and treasurer. The concern's capitalization is as follows: $500,000 preferred stock, 10 shares common of no par value, and $450,000 in first mortgage bonds. Newsprint is to be the main product, though it is expected later to turn out some wall paper also. A contract covering a period of twenty years has been entered into with the Chicago *Daily News*, on a cost plus basis, whereby the Daily Company guarantees to purchase a minimum of 7,500 tons of newsprint annually from the mill. The total output is expected to total about 10,000 tons annually.

The House of Representatives Foreign Affairs Committee last Thursday favorably reported the joint resolution, already passed by the senate, for appointment of a commission to confer with the Canadian government relative to cancellation of the Canadian Order in Council restricting importation of pulp wood to the United States.

The New York State Conservation Commission in a summary of forest fire losses given out for publication last week, reports a damage of $37,555 in the State during last spring and an expense of $34,01 entailed in fighting the flames. This spring was shown by comparison with previous years to have been the worse for forest fires since 1903. In some sections of the Adirondacks, notably in the vicinity of Saranac Lake, where the rainfall continues insufficient, there is still considerable fire danger. The total number of fires reported this sprng was 369, of which 299 were in the Adirondacks and 70 in the Catskills.

The United States Forest Service announces that the 100,000,000 cubic feet of spruce, cedar and hemlock covering a vast area of forest preserves north of Ketchikan, Alaska, has been purchased at a public sale by the Alaskan-American Paper Corporation of New York. The buyer, it is announced, has applied for power rights on Orchard Lake, and plans to erect pulp and paper mills here. The sale is one of the largest ever made of pulp timber on the Northwestern national forests.

Notwithstanding the protests of the workers, wage reductions amounting to 13 per cent for skilled men and 30 per cent for unskilled labor, went into effect last week in all paper mills of Southwestern Michigan. About 6,000 workers were affected, and the cuts will amount to about $2,000,000 a year. This is the second big pay cut for the past quarter. In May, the various mills clipped 16 2-3 per cent from the workers' wages, this reduction having been conceded by the workers without protest because it represented a war bonus payment made in May, 1920, intended especially to help them meet the then excessive cost of living.

The effects of the present business depression are being visited upon small investors in paper manufacturing establishments whose dividends have been either greatly reduced or passed altogether. This is shown to be the case in Southern Michigan and Northwestern Indiana, where a canvass of stockholders in eighteen paper manufacturing concerns shows that outside of possibly 100 capitalists, individuals of small means numbering about 2,000 hold securities as investors. Many of these are shown to be largely or wholly dependent on dividends from their stocks for sustenance. Hundreds of women and dependents are included in this smaller investing class. Some of those who feel it necessary to dispose of their holdings, find that there has been quite a shrinkage in the market value of their stock within recent months.

A break among the union workers of the International Paper Company has resulted in the opening of several of the larger mills of the company, which have been closed since May 1, when the men went on strike against the proposed reduction in wages. Within the past week thousands of skilled and unskilled workers, refusing to obey any longer the orders of the union leaders, have returned to work under the wage conditions proposed by the company on May 24. These terms represent a reduction of about 21 per cent as compared with the scale of wages existing up to May 1. The large plant at Niagara Falls is now running at full capacity, and the Montgomery mills at Turners Falls, Mass., is also running to capacity under the new conditions. At Berlin, NH., where several of the company's mills are located, some trouble is reported to have occurred when an attempt was made to import strike breakers. A clash between strikers and strike-breakers resulted in a score or more hospital cases. The move of the company was not to the liking of the Mayor, who ordered the strike-breakers to leave town. Damages done to the plant because of recent strike troubles, will probably cost company about $15,000.

A study made by the United States Forest Products Laboratory at Madison, Wis., by which it was sought to ascertain what chemicals would best serve to prevent pulp and pulp wood decay, has shown sodium fluoride to be in all probability the best disinfectant, with borax a close second. This conclusion is arrived at in a preliminary report just issued through the American Paper and Pulp Association. A more exhaustive and complete statement bearing on this vital matter will be issued in the near future. A report of mill trials at the plant of Price Bros. and Co., will soon be published in this Magazine.

As long as a man looks on his printing as overhead, he will buy the cheapest. When he realizes that it is sales and advertising literature, he will buy the best.—Push.

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. Raw Materials for Papermaking. Ch. GROUD. **Papier,** xxiv, 4-8 (Jan. 1920).—Description of various species of **mulberries (Broussonetia),** and other Moraceae, and of various species of Malvacea, together with a detailed description of the method of making paper by hand from the bark of the paper mulberry in Japan.—A. P.-C.

A-3. Bamboo as Papermaking Material. Ch. GROUD. **Papier** xxiii, 298-301 (Dec. 1920). A description of various species of bamboos, of the manner in which some of them can be cultivated in the South of France, and of their treatment in the manufacture of paper pulp. The stems are cut diagonally into disks 2-3 Cm. thick, the nodes separated, the remainder crushed, cooked for 3 to 4 hours under a pressure of 3 Kg. with 8 to 10 percent of caustic soda, washed, defibered, and bleached. Bleaching wih chlorine does not yield as white as fiber as electrolytic bleach (sodium hypochlorite) or potassium permanganate. The yield is usually about 45 per cent. The pulp may be used either alone or in combination with rag stock for the manufacture of semi-fine, fine, and de luxe papers. When used alone it can be made into very thin and fairly strong onion skin papers.—A. P.-C.

A-3. Bagasse for Papermaking. C. J. WEST. **Paper Mill,** xliv, 12, (March 19, 1921). A general review, based on a bulletin of the Hawaiian Planters' Association.—C. J. W.

A-3; K-6. Papyrus and Grass Pulps. French patent 507,773, MAURICE-AUGUSTE PIHOUEE, France, (Seine), March 21, 1920. **Papeterie,** xlii, 1124-5 (Dec. 25, 1920); **Papier,** xxiii, 303-4 (Dec. 1920). The raw grass is steeped in water, cut into pieces of a suitable length, pressed to express the excess water, and then treated in an autoclave with hot water under pressure. The fibrous material thus obtained is pressed into bales and shipped to the pulp and paper mills where it can be subjected to the usual treatments for the preparation of pulp and paper.—A. P.-C.

A-11; K-9. Carbonates of Magnesia in Papermaking. **Papeterie,** xlii, 1021-2 (Nov. 25, 1920); 1065-9 (Dec. 10, 1920); 114-8 (Dec. 25, 1920). Commercial carbonate of magnesia is a basic hydrocarbonate, the composition of which varies according to the conditions of precipitation (temperature and time of boiling). Three carbonates are known: (1) $3CO_2 4MgO.4H_2O$ (Wurtz); (2) $4CO_2 5MgO.5H_2O$ (Fristzche); (3) $5MgCO_3.2Mg(OH)_2.7H_2O$ (Carré, **Précis de Chimis Industrielle**). In the manufacture of cigarette papers it is important that the ash be high, and for this purpose (1) is most suitable. It also possesses the advantage of being the lightest of the three, and hence it is more easily incorporated into the pulp and is more readily retained in the finished paper. Methods of determining the "apparent density", the composition of the carbonate, and the impurities which may be present are described in detail.—A. P.-C.

A-15. Action of Dilute Mineral Acids on Cellulose. A. WOHL and K. BLUMRICH. **Z. angew. Chem.** xxxiv, 17-18 (1921). The insoluble residue (hydrocellulose) remaining after prolonged heating of cellulose with dilute acids is of the nature of a reversion product rather than an intermediate degradation product; such residues are often more resistant to hydrolysis than the original cellulose and unsuitable for fodder owing to their indigestibility. It is concluded that the reducing sugars, which pass into solution during the hydrolysis, interact, on continued heating, with the residue in the colloidal phase, and form reversion products.—C. J. W.

A-15. Action of Hydrogen Peroxide on Cellulose. R. HALLER, **Text.-Forschung,** ii, 79-84 (1920); **Chem. Zentr.,** xci, 4, 543-4 (1920); **J. Soc. Chem. Ind.** xxxix, 817A (Dec. 31, 1920). Most vegetable textile fibers are disintegrated by the prolonged action of 30 percent hydrogen peroxide and eventually dissolved with formation of dextrose. A cellulose peroxide which reacts characteristically with potassium iodide is formed as an intermediate product. The disintegration of the fibers is accelerated by certain cotton dyes and retarded by others. Cotton mordanted with chromium oxide is very rapidly broken down, whilst the simultaneous presence of aluminum has a retarding effect. It is possible that impregnation of laundry goods with alumina may protect them from injury from detergents containing hydrogen peroxide.—A. P.-C.

A-15. Pulp Evaluation as Affected by the Fiber Ratio in the Test Sheets. C. L. BATCHELDER. **Paper Industry,** 10, pp. 1555-1563 (1921). The fiber direction is the controlling factor in the strength test. Before a sheet can be called uniform, the fibers must be uniformly distributed. Such a condition cannot be obtained when the hand mold is manipulated as under the present method. The suction mold eliminates many of the undesirable factors and the result is a sheet more nearly perfect than can be made by any of the other methods described.—C.J.W.

A-16. Acid Resisting Alloy. Fr. patent 501,870. K. EENBERG, France, Feb. 7, 1920. **Chimie et Industrie,** v, 51 (Jan. 1921). This alloy, called Maridal, is a complex chromo-manganic brass, having a high tensile and transverse strength and great resistance to shock. It is tough, elastic, and acid-resistant. Its composition may vary between the limits Cu 54 to 58.5%; Zn, 34 to 30%; Cr, 0.5 to 4.1%; Mn, 0.5 to 3.6%; Fe, 0.5 to 2%; Al, 0.4 to 1%; Ni, 0.3 to .05%; copper phosphide (15%), 0.3 to 0.08%. The manganese is first added to part of the molten copper and after the addition of a further amount of copper the chromium, nickel, zinc and iron are added in the order named. The aluminum is added in several successive portions before the addition of each of the other constituents, and the phosphorus is added just before casting.—A. P.-C.

B-4. The House that Jack Pine Built. **Paper Mill,** xliv, 12 (March 19, 1921). Jack pine is suitable wood for newsprint paper.—C. J. W.

B-4. Waterproofing Wood and Recovery of Liquid Products. Fr. patent 493,557, C. ROY, France, May 5, 1919. **Chimie et Industrie,** v, 66-7 (Jan. 1921). Cold water (or water heated to a certain temperature) is injected into the unbarked wood, thereby driving out

the sap and other liquids such as resins, oils, and albuminoid bodies. The waterproofing is complete by precipitating out the casein. The driving out of the sap and its replacement by casein renders the wood resistant to the action of the heat, water, and light, prevents it from warping, and makes it very easy to glue. Moreover, the liquids which were driven out of the wood can be utilized.—A. P.-C.

B-9. The Snell Forestry Bill.—Paper Industry, ii, 10, pp. 1575-1579 (1921). Proceedings of the hearing before the House sub-committee.—C.J.W.

C.-5.—Artificial Fog as Fire Prevention. F. J. HOXIE. **Paper Industry,** ii, 10, pp. 1540-1541 (1921). **Paper,** Dec. 15, 1920, and Pulp & Paper, Jan. 6, 1921.—C.J.W.

C-6. Saw Filing Machine. Can. patent 207,667, FRANK PYSZ, Taunton Mass., U.S.A., Jan. 18, 1921. —A. P.-C.

E-2. Sulphite Waste Liquor Utilization. J. G. VARLOT. **Papier,** xxiii, 281-4 (Dec. 1920). A brief review of various uses for sulphite waste liquor: binder for roads and briquetted fuels, tanning extracts, fuel, and ethyl alcohol.—A. P.-C.

E-5; F-5. Removing Fibrous Materials from the Bottom of Digesters. W. M. WALLACE. English patent 156,025. March 10, 1920.—C.J.W.

E-5; F-5. Pressure Lock for Digesters. Can. patent No. 207,708, AKTIEBOLAGET VAPORACKUMULATOR, Stockholm, assignee of JOHANNES RUTH, Djurshelm, both in Sweden, Jan. 18, 1921. A pressure lock in digesters to prevent the liquid contents of the digester from flowing back at a lower pressure in the steam conduit, consisting of a pipe opening into the steam conduit between the cut-off valve of the digester and another valve, preferable a non-return valve, the said pipe communicating with steam, air, water or other pressure medium of higher pressure than the maximum pressure of the digester.—A.P.-C.

G-11. Pulp Reclaimer. C. S. BIRD. English patent 146,891. July 6, 1920.—C.J.W.

E-0. Extraction of Cellulose from Ligneous Material. R. HARTMUTH. German patent 326,705. July 9, 1919. The raw material is heated with phenols, or substances having a phenolic character, in a concentrated form diluted with water, alcohol, benzene, benzene derivatives, or aliphatic hydrocarbons, in the presence of a catalyst. A suitable catalyst is 0.01 per cent hydrochloric acid. The lignin combines with the phenol to form a soluble substance, which may be used as an adhesive, lacquer or the like, while the cullulose remains white and unchanged.—C.J.W.

E-0. Extraction of Cellulose from Wood. W. SCHLOSSER. German patent 328,729. Sept. 27, 1919. The raw material is treated either hot or cold with primary and secondary aliphatic and aromatic amines, either alone or diluted with alcohol or benzene, etc. The reaction proceeds more rapidly in the presence of a condensing agent such as hydrochloric or zinc chloride.—C.J.W.

E-0. Process for Recovery of Cellulosic Materials. R. SCHWARZKOPF. German patent 328,730. Sept. 27, 1919. The raw material is treated either hot or cold with acid chloride, such as sulphuryl chloride, thionyl chloride, phosphorus oxychloride, acetyl chloride, benzoyl chloride, etc., which may be diluted with indifferent solvents, such as benzene and carbon tetrachloride. In cases where the acid chlorides do not dissolve the noncellulosic substances directly the cellulose may be purified by an after-treatment with alkali.—C. J. W.

F-4. Extracting Soda Salts from Black Ash. GEO. M. TROSTEL. **Paper Industry,** ii, 10, pp. 1563-1565 (1921). The black ash is crushed and mixed with weak liquor so as to be handled with an open impeller centrifugal pump. This is then ground in a tube mill and discharged into receiving tank provided with agitator and mixed with more liquor, which is then lifted with a centrifugal pump, caused to pass through an 18-mesh screen and then onto a rotary suction filter, the filtrate of which will be entirely strong liquor. The filter cake is mixed with hot water and fed to a second rotary suction filter, giving a weak liquor of about 0.7 degree Bé. The process is continuous, the volume of liquid to be handled reduced and better control is secured.—C.J.W.

G-5. Centrifugal Pulp Thickener. Can patent 207,628, JULIUS T. JAEGER, Iroquois Falls, Ont., Canada, Jan. 18, 1921. A centrifugal pulp thickener, comprising a rotatable tabular member flaring outwardly at the discharge end, means for conducting the pulp from the inner perimeter of the tubular member, and a centrally located means for conducting the waste water from the tubular member.—A.P.-C.

G-6. Screening and Filtering Apparatus. Can. patent 207,705, HAROLD DONALD WELLS, Glens Falls, N.Y., U.S.A., Jan. 18, 1921. In an apparatus of the type described, a box provided with spaced transverse partitions, a screen extending into the said box and provided at the under side with spaced transverse partitions on the box and screen forming suction and pressure compartments underneath the screen above the box partitions and forming water sealing compartments in the box, and means imparting a rising and falling and a longitudinal oscillating motion to the said screen.—A.P.-C.

G-11. Decantation Apparatus. (Save all). Can. patent 207,600, JOSEPH DENOEL, Lambecq, Belgium, Jan. 18, 1921. A decantation apparatus comprising an inverted funnel placed in a casing, means for evacuating continuously a current of the heavier portion of the liquid at the bottom of the casing, means for discharging a current of the clear liquid at the upper end of the casing, said casing being of conical shape so that the lowest velocity reached by the liquid at the bottom of the funnel is maintained during the ascending movement of the clear liquid between the funnel and the casing.—A. P.-C.

K-3: K-6. Ram for Filling Digesters. M. ARGY et H. LHOMME, **Papeterie,** xliii, 14-7 (Jan. 10, 1921). In filling a digester with a bulky material such as straw, esparto, etc., it is necessary to fill the digester as completely as possible, as the steam and liquor consumption and the labor are the same irrespective of the amount of material charged into the digester. This result is sometimes obtained by tamping down the straw by hand; but this is inefficient and slow. Various types of mechanical rams have been developed but they are all based on the same principle, viz., a heavy weight is raised and allowed to fall through the charging hole on to the material being located into the digester. These are used to a large extent in Holland and Germany; and it is considered that 25 to 30 percent more straw can be loaded into the digester in this manner than by tamping down by hand.—A. P.-C.

K-6. Treatment of Waste Printed Paper. Can patent 207,594, CHARLES T. CROCKER, Fitchburg, Mass,

(Continued on page 770.)

PULP AND PAPER NEWS

Pressmen and press assistants, lately on strike in Toronto, have been seeking their former jobs at $36 a week for a week of forty-eight hours. This was the last offer of the employers during the negotiations which were termintead by the strike on the 8th June, and the wages represent eighty cents a week more than the men were earning when the strike took place. However, a certain number of them cannot be given back their positions, though the employers state that they are endeavoring to hire as many of those lately on strike as possible.

With regard to the strike of the compositors, the Toronto Typothetae and the Toronto members of the Canadian National Newspapers and Periodicals Association have leased a flat on Adelaide Street, Toronto, for the purposes of a school for printers. Equipment has been ordered, and the school should be in full swing by the time these lines are in print. The apparatus includes monotype equipment, including five keyboards and four casters, with matrices, molds, etc. Five linotype machines are also included in the equipment, and type, cabinets, racks and galleys have been assembled. The idea is to have the students spend half their time in the school and the other half in the shops of the Typothetae. This will enable sixty students to be passing through the school, which has accommodation for thirty pupils at one time. A fixed educational standard is being demanded, as the employers take the view that printers should have, at the very least, a high school education. They believe that a high standard of education will be beneficial to the industry and the printer alike. Great interest is being taken in this school, and quite a surprisingly large number of applications to join it have been received from men and women who are anxious to learn the printing trade. The cost for a course at the school is $50, to be paid by the pupil or employer, and, if it is kept supplied with its full complement of pupils, the school should be self-supporting. The establishment of this school is of great significance, as it is obviously based on the assumption that the compositors' strike is incapable of settlement and that, in the view of those who belong to the Typothetae, it is time a new order of things was ushered in.

Pulp and paper companies operating in Northern Ontario resent the statement of the Fire Inspector of Cochrane, Ont., criticizing owners of pulpwood on the T. and N.O. railway sidings for failure to cooperate in protecting the piles from bush fires. The Inspector, however, claims that his criticism was directed principally at owners of pulpwood which is awaiting export, and thousands of cords of which have been burned without effort on the part of its owners to save it. While on the question of fires, by the way, it must be admitted that the Province of Ontario is not doing its full duty as regards the protection of its forests. It is largely in consequence of its neglect of this duty in this respect that the havoc-making fires, of which we have lately had such disastrous examples, do such appalling damage over such large forest areas every year.

Messrs. James J. Freel and Charles A Summer, respectively vice-president and secretary-treasurer of the International Stereotypers' Union, were in Toronto last week, making arrangements for the convention of the Union, which commenced its session in the Prince George Hotel, Toronto last Monday. In the course of an interview Mr. Freel reviewed the situation and defended the action of the printing trade unions. Mr. W. A. Sutherland, secretary of the Toronto Typothetae, issued a reply to this defence in the course of which he claims that the organization of the United Typothetae of America is not bound by the action of a minority of its members acting as a closed shop division. He asserts that the United Typothetae of America is prohibited by its constitution from dealing with Labor matters; and that the local Typothetae has sole jurisdiction in this regard, and adds that the United Typothetae of America, at its conventions in 1919 and 1920, went on record as condemning the action of certain of its membership in connection with the forty-four hour week. "As far as we can learn," Mr. Sutherland concludes, "only one per cent of the printing plants ofthe United States have granted the forty-four hour week. The remainder never promised, or agreed to, the forty-four hour week, and are operating their plant on a forty-eight hour week.

At their meeting on Wednesday night of last week, in the Methodist Book Room, Toronto, employing printers of the Toronto Typothetae adopted the following resolution: "That the Defence Committee recommend that no member patronize any plant operating on the forty-four hour basis and conceding Union demands." The Secretary of the Toronto Typothetae, when questioned as to what prompted the passing of this resolution, preserved a non-committal attitude, but it is obvious that its intention is to put the forty-four hour shop under the ban of a business boycott.

A party representing the Backus interests reached Winnipeg last Friday from Kenora en route for International Falls. The party included Mr. E. W. Backus, Mr. D. McLeod, general manager of the Keewatin Lumber Company, and Capt. George Macpherson. "Only the water is now required to go ahead with the big developments at Kenora," stated a member of the party. "Everything is ready. We've got the timber limits and everything. All that is wanting is the water."

The Provincial Paper Company is constantly making extensions and improvements to its various plants. This week it expects to start a new steam boiler plant at its Mille Roches plant. The equipment installed includes three 250 H.P. water tube boilers with stokers and other apparatus. The Company is also putting in a new water system at Port Arthur. Heretofore, the city has supplied the water, but, as it can no longer do so in sufficient quantities, the Company has decided to install its own system. This water system will be of sufficient capacity to supply the new paper mill which Provincial contemplates building as soon as conditions warrant. At Thorold, the Company has just completed the addition of one storey to the finishing room of its plant there, and has also completed the new concrete floor in its No. 1 beating room.

At the first meeting of the new Executive of the Quebec division of the Canadian Manufacturers' Association held in Montreal, last Friday, strong expression was given to opinion in favor of the establishment of a Canadian Research Institute, and in favor of the legislation necessary to secure funds for the establishment and maintenance of the organization, and representations along these lines will be made to the acting Premier, the Rt. Hon. Sir George Foster.

Dr. John S. Bates, formerly superintendent of the Forest Products Laboratories, Montreal, is at Bathurst, N.B., doing some special chemical engineering work in connection with the pulp mill of the Bathurst Co.

Mr. Edward Beck,author of the interesting current series of articles on Forestry in Scandinavia, for which he made a special trip to Europe, is now on his way home.

As a result of playing good baseball on July 10th the Grand Mere team beat Three Rivers 3-0 and tied the latter for first place in the St. Maurice Valley league.

Major Clement King, M.C., of the International Mill at Three Rivers, was prevented by illness from commanding his batting at field practice at Petawawa.

Mr. J. D. Mason's new house at Grand Mere was in danger last Sunday when fire, believed due to spontaneous combustion, broke out in a pile of loose lumber. Thanks to Sunday golfers the fire was put out before any serious damage was done.

Mr. William Carter, who is in charge of the pulp and paper machinery department of the Canadian Ingersoll Rand Co. is on a business trip to the pulp and paper mills in Newfoundland.

There is a persistent rumor that the old paper mill at Hartsville, N.S. is to be reorganized and put in operation by Halifax interests. We understand that at the present time there is no paper machine running in this province.

MR. DELVAUX GOING TO BELGIUM.

Mrs. V. Delvaux and children are sailing from Montreal July 23rd on the Scandinavian for Belgium where they intend to reside in future Mr. Delvaux joining his family in November. It is with sincere regret that we intimate the departure of Mr. and Mrs. Delvaux. The former has acted in the capacity of Works Engineer for the Belgian Industrial Co. During Mr. Delvaux's tenure of office extensive additions and many important alterations have been undertaken and successfully completed to the plant and buildings of the company and much credit is due Mr. Delvaux for construction and efficiency which has so greatly increased the output of all departments and has placed the mills of the Belgo Company in the front ranks of the paper and pulp companies of which this country has reason to be proud as well as grateful to those responsible for their rapid development amongst whom Mr. Delveaux may be numbered.—Three Rivers "Chronicle."

LOOKS LIKE MORE PRINTING.

Although the hot summer months are not particularly busy ones in most lines of business, the weekly output of the Mergenthaler Linotype Company continues to reflect a healthy condition of things in the printing and publishing fields.

In the first week in July fifty linotypes were shipped, among them a model 24 machine, the latest model of multiple magazine linotypes.

ONTARIO TIMBER LIMIT SOLD.

The Transcontinental Development Company was the successful tenderer for the Nagagami pulp and timber limit recently, put up for sale by the Ontario Government. It contains an area of 2,300 square miles. Under the terms of the contract the company is to spend $1,000,000 on a pulp mill, with a daily output of 100 tons and employing 200 persons. The sum of $200,000 is to be spent the first year, $350,000 the second year and the balance the third year. A paper mill with a capacity of seventy-five tons a day will be erected when and where ordered by the Minister of Lands and Forests.

SWEDISH MILLS ACTING INDEPENDENTLY.

Cablegrams from Sweden to New York are reported to this effect that minimum prices on sulphite and kraft pulps established by the Swedish Cellulose Association have been abolished, and that members of this organization were now endeavoring independently to market pulp at whatever prices could be secured. These advices supplemented mail advices previously received to the effect that the price agreement might be abrogated on July 1 owing to the situation that has developed in the pulp industry in Sweden, where it is understood producers have large stocks of pulp which they are having much difficulty in finding an outlet for. This development was viewed by local importers as explaining the sharp reduction in quotations named in offerings of pulp from Sweden during the past few days, and some frankly stated that they would not be surprised to see a merry war result among the Swedes in an effort to market pulp in the United States, such as has existed at intervals in the past.

MORE POWER FOR ESPANOLA.

The International Nickel Company, Copper Cliff, has secured contract from the Spanish River Pulp and Paper Company for the supply of electric power to the paper mills at Espanola, at the rate of 3,000 to 5,000 horse-power daily. The Nickel Company will develop this power on the Spanish River, at High Falls, where they recently completed the big Eddy Dam, built at a cost of $3,500,000. This contract calls for the erection of a 60-cycle current plant, costing approximately $150,000, to be built by the International Nickel Company.

FULFIL PROMISES OR FORFEIT LIMITS.

According to Premier Drury, speaking to Port Arthur citizens last week, the Great Lakes Pulp and Paper Co. is under threat of losing its Black Sturgeon timber limits near Nipigon, if it does not fulfill its promises for development before Jan. 1, 1922. "If the Company cannot live up to the terms of agreement then the limits will be turned over to someone else who can," said the Premier.

Did you ever notice that the man whose stock in trade is brains always has a funny looking sample case? But he can deliver the goods.

The faultfinder is rarely a pathfinder.

When Service and Quality keep house together, Satisfaction hangs up its hat for a long stay.—Paragrafs.

(Continued from page 667.)

U.S.A., Jan. 18, 1921. In the manufacture of paper, the process of subjecting a continuous stream of pieces of waste paper to the action of a hot alkaline solution, by causing each oncoming piece of paper, as nearly separate as is possible, to be submerged in and moved through, said solution to facilitate the exposure of its surfaces to the action of said solution, for the purpose of cutting, removing or neutralizing the ink or other material fixed to said surface, and by not only removing said pieces of paper from said solution, but also by depriving said pieces of paper of most of said solution, and exposing them to the air to cool preparatory to being treated in a washing machine.—A.P.-C.

K-6. Removing Ink from Waste Paper. Fr. patent 508,153, Newsprint Reclaiming Corporation, July 17, 1920. **Papier,** xxiv, 22-4 (Jan. 1921). A trough is placed across the width of the beater and extends from the midfeather to the edge of the vat. It consists of a vertical solid metal plate or wooden board and of a perforated metal plate or screen placed at an angle of about 45° to the other one. The trough contains a spray pipe and an outlet. As the beating of the waste paper proceeds, the mineral oil which served as a vehicle for the ink rises to the surface, carrying with it the particles of ink. As the stock comes against the screen, it is deflected downwards and passes under the trough, while the oil and ink pass through the screen and are removed through the outlet. The spray may be used either continuously or intermittently to keep the screen clean.—A. P.-C.

K-10. Paper Size. Can. patent 207,599, JUDSON A. DECEW, Montreal, Quebec Canada, Jan. 18, 1921. A method of incorporating resin size into paper stock in beaters or mixers without having it coagulated by earth salts which may exist in solution which consists in adding a sufficient quantity of alkali so that the concentration of the basic ions will prevent the formation of earth resinates, then adding a resin size and finally precipitating with aluminum sulphate.—A.P.-C.

K-11. Papermaking Machines. Process Engineers, Inc., English patent 145,440. June 18, 1920.—C.J.W.

K-11. Sectional Paper Machine Drives. H. W. ROGERS. **Paper Mill,** xliv, 16. Developments by the General Electric Company.—C. J. W.

K-11. Stock Consistency Regulator. Fr. patent 508,191, WILLIAM P. FEENEY, U.S.A., July 19, 1920. **Papeterie,** xlii, 1121, 1124 (Dec. 25, 1920); **Papier,** xxiv, 24-5 (Jan. 1921). Same as U.S. patent 1,331,057, Feb. 17, 1920, and Can. patent 200,741, June 8, 1920.—A. P.-C.

K-11. Prevention of Foam on Dandy Rolls. Fr. patent 509,845, Kangas Pappersbruks Aktiebolag and Onni Suursalui, Feb. 12, 1920. **Monit. Papeterie,** lvii, 1, 19 (Jan. 1, 1921). A narrow strip of felt is made to rest along the whole length of the roll and a spray of water is directed against the surface of the roll from the inside so as to strike against the felt. The water is evacuated through the journals by means of a drain inside the roll. — A. P.-C.

K-11. Papermaking Machine. Can. patent 207,607, PIERRE GELINAS, Grand Mère, Quebec, Can., Jan. 18, 1921.—A. P.-C.

K-11. Improved Dandy Rolls. Fr. patent 509,196, WALTER KNOWLES TROTMAN, England. **Papier,** xxiv, 25-7 (Jan. 1921); **Papeterie,** xliii, 62-4 (Jan. 25, 1921).—A. P.-C.

K-14; R-4. Economy of Standardized Paper Sizes. N. J. WERNER. **Paper Mill,** xliv, 16.—C. J. W.

K-17. Paper for Banknotes and Bonds. French patent 505,373, CHARLES-ANDRE COPPIER, France. **Papeterie,** xliii, 64-9 (Jan. 25, 1921). The paper is subjected to great pressure in contact with a metal stencil or a sheet of metal having a suitable design engraved on it by one of the usual engraving processes. —A. P.-C.

K-18. Better Grades of Straw Board. RICHARD CLAYTON **Paper Industry,** ii, 10, pp 1540-1541 (1921). Uniformity in rotary cooking is very essential. Three bushels of lime to a ton of straw, enough water to keep the lime from burning the straw, and ten hours rolling and cooking at 40lb steam pressure prepares the raw material for the stock pit. In beating the roll should be half an inch from the plate for the first ten or fifteen minutes to straighten out the straw; the roll is then gradually lowered until it just brushes the plate. The stock is then passed through a jordan and finally through a No. 35 screen. The board should be dried slowly.—C.J.W.

K-20. Manufacture of Parchment Paper. C. G. SCHWALBE. German patent 303,305. June 23, 1917. Before being made into paper the raw material, such as cellulose, halfstuff, woodpulp, etc., is treated in the edge runner or in the hollander with oxidizing agents, such as oxides of nitrogen, permanganates, peroxides, perchlorates or perborates. By this means parchmentisation is effected and a product of increasing tenacity is obtained.—C.J.W.

K-22. Manufacture of Cigarette Paper. Zellstoffabr. Waldhof. German patent 327,735, Nov. 29, 1917. Sulphite pulp to be used for the manufacture of cigarette paper is treated with alkalis whereby its unpleasant taste is removed.—C. J. W.

K-23. Machine for Making Marbled Paper. French patent 507,419, RICHARD-JOSEPH WEBB, England, June 21, 1920. **Papier,** xxiii, 302-3 (Dec. 1920).—A. P.-C.

K-23. Treatment of Paper or Fabrics for Electrical Apparatus. Fr. patent 502,701, P. BARNIER, France, Feb. 26, 1920. **Chimie et Industrie,** iv, 796 (Dec. 1920). The paper or fabric is impregnated, in an autoclave containing a suitable set of reels, with a boiled, oxidised, and specially purified oil, together with a solvent. The excess liquid is recovered and the material is dried by hot air in a long and suitably ventilated tunnel. The apparatus is so designed that the whole treatment is carried out without contact with the air or with dust. —A. P.-C.

K-23. Paper Reinforcing Machine. Can.. patent 207,627, PATRICK TRACY JACKSON, Cambridge, Mass., U.S.A., Jan. 18, 1921. A machine for reinforcing paper fabrics by enclosing between two superposed fabrics transversely and longitudinally extending unspun fibers, comprising, in combination, means for feeding two paper fabrics, means for feeding a sheet of fibers in unspun condition in transverse relation to said fabrics, means for feeding another sheet of fibers in longitudinal relation to said fabrics, and means for adhesively uniting said fabrics with the unspun fibers between them.—A.P.-C.

L-4. Container. Can. patent 307,739, The Stokes & Smith Co., Philadelphia, Pa., assignee of JOHN STOGDELL STOKES, Moorestown, N.J., both in U.S.A., Jan. 18, 1921.—A.P.-C.

L-7. Textile Threads from Wood. FRANK. **Papeterie,** xlii, 1106-13 (Dec. 25, 1920); xliii, 9-13 (Jan. 10,

1921); 50-4 (Jan. 25, 1921). So called paper thread is not a true textile thread, but rather a very fine twine, and the fabrics made from them are plaited rather than woven. Artificial silk, like true silk, is a non-fibrous thread; while the ordinary textile threads, such as cotton, flax, etc., consist of relatively long fibers spun and twisted to form a thread. The researches of Francis Beltzer have proved the possibility of the synthesis of cellulose fibers but in spite of the wonderful results obtained it is probable that cellulose fibers will be obtained industrially from the natural wood fibers rather than from the synthetic product. A few of the general principles of the structure of plants and trees are briefly reviewed to show in what direction researches must be undertaken to arrive at the desired result, which is the isolation of the fibrous network of the tree, and not of the ultimate cellulosic fibers.—A. P.-C.

L-7. Impregnation of Paper-Yarn Fabrics. O. RUFF, German patent 327,399. Oct. 27, 1917. Fabric impregnated with a phenol, such as cresol, formaldehyde, and an alkali, is heated in an atmosphere containing carbon dioxide. The change of the caustic alkali to carbonate is favorable to the formation of the water-insoluble phenol-formaldehyde condensation product, and both the dry and wet strengths of the fabric are increased. —C.J.W.

M-9. Handling of Pulp Bales. Monit. Papeterie, lviii, 61-4 (Feb. 1, 1921). A description of the equipment (travelling cranes and hoists) used at the Essonnes mill of the Papeteries Darblay for handling pulp from the cars to storage and from storage to the paper mill.—A. P.-C.

M-0. A New Weightometer for Soft Stock, Chips and Acid. E. J. TRIMBEY. **Paper Mill,** xliv, 16, and **Paper Trade Journal,** lxxii, 16. Description of the new Allen weightometer for weighing chips, soft stock, etc. —C. J. W.

M-0. Bituminous Lining for Surfaces Exposed to Corrosive Action. Can. patent 207,711, The Barber Asphalt Paving Co., Philadelphia, Pa., U.S.A., Jan. 18, 1921. A bituminous composition for use as a protective coating for surfaces exposed to the action of corrosive fumes of liquid, containing about 15 to 35 parts of asphaltum free from calcareous material, fine non-calcareous mineral particles smaller than 0.1 in. about 25 to 50 parts, and coarse mineral particles of igneous rock larger than 0.1 in. about 30 to 45 parts.—A.P.-C.

M-0. Grinding Apparatus. Fr. patent 135,085, RENE-FRANCOIS-XAVIER DESTAINVILLE and JEAN LAMASSIAUDE, Oct. 14, 1920. **Papeterie,** xliii, 69-70 (Jan. 25, 1921.) Material such as grain, soft stone, sand, earth, etc., and more particularly fibrous materials such as are used in the manufacture of pulps, papers, guncotton, etc., are crushed between two hyperboloids of revolution which are tangent to, and rotate against, each other.—A. P.-C.

O-2. Sand Filter. Can. patent 207,574, NEIL McKECHNIE BARRON, New Beckenham, Kent, England, Jan. 18, 1921. A sand filter comprising in combination a sand chamber, an inlet for sand and an inlet for unfiltered water at the top of said chamber, a plurality of filter tubes within said chamber each comprising a pair of co-axial perforated tubes with a sand layer disposed between them for filtering the water, means for spraying water under pressure on the outer surfaces of the outer tubes aforesaid for the purpose of cleansing those surfaces, sand excluding outlet means for filtered water at the bottom of said chamber wherecleansing those surfaces, said excluding outlet means by the sand can be finished out for cleaning purposes. —A. P.-C.

O-3. Purification of Boiler Feed Water. G. PARIS. **Chimie et Industrie,** iv, 722-30 (Dec. 1920). A discussion of the continuous blow-off method of water purification, together with a discussion of its merits. —A. P.-C.

O-3. Purification of Water for Industrial Uses. NOEL ADAM. **Publications Techniques,** iii, 7-9 (June, July, August, 1920). Detailed description of the Gail and Adam apparatus for the continuous treatment of water (lime and soda ash being taken for the particular case described) for industrial purposes and of its method of operation, together with examples of the nature and quantity of purifying reagents required for the treatment of various industrial waters (waste liquors from bleacheries, straw pulp mills, starch factories, dairies, forges, pyroligneous acid plants, dyeworks, etc.)—A. P.-C.

R-1. The Paper Industry in 1920. Paper Mill, xliv, 16. Review by months of the most important events of the year.—C. J. W.

R-5. Australian Paper Industry. Papier, xxiii, 228-9 (Dec. 1920). A brief review of the present status of the industry and of its dependence on foreign sources for its raw materials.—A. P.-C.

R-5. British Trade in Pulp and Paper During 1920. Pulp and Paper, xix, 135-7 (Feb. 3, 1921). General review of the conditions prevailing on the English pulp and paper market during 1920.—A. P.-C.

R-11. Committee on Education. Progress report on the work accomplished on the textbooks since the last convention, from **Pulp & Paper,** Jan. 20, 1921.—A. P.-C.

R-11. Progress of U. S. Paper Laboratory in 1920). Report of the director of the Bureau of Standards concerning the work of the Paper Laboratory during 1920. The paper testing laboratories and experimental paper machine have been moved to new quarters in which a large room has been equipped with a conditioning apparatus for maintaining 65 per cent relative humidity and 70° Fahr. temperature. New equipment has been obtained consisting of a 300-pound concrete beater with necessary and stuff chests, a larger screen, a sheet cutter, and a supercalender. During the year the following problems were studied: tearing strength of paper, paper for lime and cement bags, substitute for sand bags, determining the sizing quality of paper, preparation of samples for the microscopic estimation of fiber content in papers, identification of sulphate pulp, preparation of samples for the microscopic estimation of fiber content in papers, identification of sulphate pulp, preparation of photomicrographs of a set of samples of authentic papermaking fibers, study of the methods and technic used in the microscopy of paper fibers and the proper use of the necessary instruments and apparatus, study of the suitability of various fibers for papermaking, production of a micrograph paper with the papermaking equipment of the laboratory, preparation of specification for lime to be used for cooking rags to be used for papermaking. During the year a total of 4,362 samples of paper were tested, of which 3,090 were submitted by government departments and 1,272 by public and private interests. A large amount of miscellaneous information in regard to the testing and manufacture of paper has been given through correspondence and conversation with visitors.—A. P.-C.

R-11. The Care of Rubber Articles. Papeterie, xlii, 930 (Oct. 25, 1920); **Paper,** xxvii, 21 (Jan. 26, 1921). Hints on the proper method of caring for soft rubber articles.—A. P.-C.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 16th July.—During the past week certain branches of the paper trade have evinced an increased activity. Pretty generally, however, the complaint still continues to be heard that the demand is too "spotty" and the buying only for immediate requirements, so that orders, in the aggregate, are for less than what may be regarded as the normal volume. There has been little, if any, relief in the trade depression prevailing almost universally, and, as a consequence, consuming industries generally are using far less than the customary quantities of paper, while this same trade depression continues to be reflected in a tremendous decrease in the total volume of advertising which, in its turn, results in a decreased use of certain lines of paper. Meanwhile, the strike of the Toronto compositors still continues, with little prospect of an agreement being reached. Each side still professes confidence in its ability to prosecute the struggle to a successful issue, and—what is equally significant—confidence in the equity of the course it is taking in the matter. However, as has been indicated before in these columns, the concensus of opinion, in business and commercial circles, is that the strike will "peter out." It may, of course, be said that, in this view, "the wish is father to the thought." But that the view is very widely entertained is unquestionable.

On the whole, the paper market is at present in a condition far removed from normal

PULPWOOD.—Many of the mills report that they have large stocks of pulpwood still undisposed of. But it does not seem likely that there will be much market activity until both the extent of probable production and the possibilities as to prices have been more definitely ascertained. Pulpwood prices have undoubtedly taken a little journey on the toboggan since last winter, but prices are still unsettled, particularly as regards spruce and balsam.

NEWSPRINT.—Trading in newsprint still continues fair, for reasons that have been given lately. There have been no recent changes of any note in prices.

WRAPPING PAPERS.—Business in wrapping papers generally is somewhat slow, and the improvement which the autumn season is considered likely to bring will be very welcome. The business in Kraft wrapping paper is better than that in other lines. Kraft wrapping paper has undergone a reduction in price of 1¼ cents a lb. That is to say, it has been reduced in price from 10 cents to 8¾ cents a lb. Other wrapping papers, too, have experienced a reduction in price, this reduction varying from ¾ of a cent to 1½ cents a lb.

COATED STOCK.—The recent reduction in price of coated stock has, perhaps, been responsible for some increased movement in this line.

MANUFACTURING STATIONERY.—Makers of manufacturing stationery, envelope makers and other allied lines, are feeling the detrimental effect of the strike and extreme caution is being exercised in buying.

BRISTOL BOARDS.—There has been a distinct improvement in business in this line during the past week. Demand, however, continues to be too spasmodic in character to inspire any very great confidence in its sustained improvement.

TOILETS AND TISSUES.—According to a report furnished the writer by an important mill today, business in toilets and tissues, particularly in towels, napkins and toilet papers, continues to give little cause for complaint. The mill in question is working full time.

BOOK AND WRITING PAPERS.—There has been recently some little improvement in the demand for book and writing and other high grade papers. The orders, it is true, are small compared with the orders of last year, but there has been, of late, a decided increase in their number.

NEW YORK MARKETS.

New York, July 16 (Special Correspondence).—The mid-summer lull in business seems to be making itself felt forcibly every day in the paper market and there has been very little of note doing in the trade in New York this week. The scattered buying has been almost exclusively against immediate requirements, and the fact that the average consumer is today in need of far less than usual amounts of paper precludes the necessity of placing orders other than for small commitments. When one stops to analyze prevailing circumstances, the current slow demand for paper and paper board is creative of no surprise. Consuming trades are, with few exceptions, experiencing exceptional dullness in their own fields. Here and there are bright spots on the industrial horizon—the woolen goods industry, for example, which is authoritatively reported operating at between 90 and 95 per cent of mill capacity—but such instances are by far the exception, and the business situation generally is decidedly depressed, with a great majority of industries running at no better than half of their full ratio.

It stands to reason therefore that demand for paper should be limited. Members of the paper trade view their own industry as presenting more encouraging features than in a long time; it being commonly felt that paper prices have been reduced to levels comparing very favorably with normal, and that consumers consequently have no just cause to hold back in buying, because of the present cost of paper. It can be truthfully stated that prevailing prices on some kinds of paper are actually below the cost of manufacture. Taking box boards as an illustration, plain chip board is selling today at $30 per ton and less delivered in New York, notwithstanding that even those manufacturers who are situated so as to enjoy the lowest cost of production declare that chip board cannot be made at this price under present labor and raw material costs, let alone their realizing a profit in sales at this basis.

It is therefore felt that the ruling situation in the paper market is due entirely to conditions existing in the consuming fields; that users of paper and board are not buying because they are not in need of supplies, and that when the requirements of consumers expand—as everyone is optimistic enough to believe must come about in the not distant future—that the



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improvement will be immediately felt by paper manufacturers It is a recognized fact that paper mills today have comparatively large stocks of their product on hand; whereas jobbers' holdings are acknowledged to be down to the bone. As soon as dealers regain confidence in the market and commence to fill their shelves again, manufacturers should experience a much broader demand. Some in the trade assert that should jobbers set out to acquire but half of the stocks that they ordinarily carry mill stocks would be almost completely moved. In other words it would appear that today instead of the middle man holding the normal stock of finished paper the manufacturer has it, which turned-around condition of affairs prompts some to take a bearish view of the situation, when as a matter of fact there is nothing whatever to be creative of concern.

There is no change reported in the newsprint market. Spot demand is rather narrow, but mills are making regular shipments to contract customers, and consumption of print paper appears to be keeping up to normal for this period of the year. There are no rumors floating around concerning any contemplated alteration in the contract basis fixed for deliveries over the third quarter, and while offerings of foreign newsprint at comparatively low prices have an unsettling tendency, spot quotations also are maintained at around 5 cents per pound for roll news.

Book papers are quotably steady though, as previously outlined, some manufacturers are granting concessions when to refuse to do so would mean loss of the business. Machine finished book is bringing between 6.50 and 7 cents per pound at mills, and super book an average of 8 cents.

Wrappings are moving mainly in small lots but at unchanged prices, No. 1 domestic kraft being quoted at 6.50 to 7 cents a pound at mills. There is a relatively steady call for tissues and quotations are maintained. Fine papers are in limited demand. Jobbers are buying simply to fill commitments, and consumers, individually and collectively, are taking but small quantities as directly needed.

The board market is distinctly quieter than it was a short while back. Members of the selling trade view the present condition as the lull before the fall buying season, and report receiving numerous inquiries concerning deliveries for the latter part of August. One local mill agent states that he has more board on order for delivery next month than he has sold in any month this year. Prices are easy, and some sales at surprisingly cheap figures have been reported, plain chip having been purchased from mills near to New York at $28 a ton delivered sidewalk and filled news board at $32.50 delivered. More representative quotations, however, range above these levels.

GROUND WOOD. — The tone of the mechanical wood pulp market is stiffening, and prices, although failing to undergo any substantial change, tend decidedly upward. The principal reason for the firmness is the closing down of grinding plants because of low water in mill streams, thus reducing production and causing producers to be more reluctant to offer ground wood. Domestic manufacturers are quoting $30 per at mills as a minimum price, and this appears to be the lowest at which purchases can be made except in the case of Canadian mills situated far away from consuming points and where the higher freight involved brings the cost of pulp to the consumer up to the same basis as that of domestic origin. With newsprint mills resuming operations, it is felt that demand for ground wood is due to expand, and dealers contend that the moment demand broadens prices will rise.

CHEMICAL PULP. — Uncertainty prevails in the chemical pulp market. Domestic manufacturers continue to maintain quotations on their product, but with offerings being received from Sweden at prices in some cases below those named by producers here, consumers are holding off in buying and it is questionable just what figures represent actual market levels. It is reported that No. 1 strong unbleached Swedish sulphite is available for shipment from primary markets at as low as 3.50 cents per pound landed on this side, which indicates the cheap prices named on foreign sulphite. Scandinavian kraft is said to be freely available at 3.25 cents ex the dock, and other grades of Swedish pulp at proportionately low prices. Domestic news grade sulphite is quoted at 3.25 and 3.50 cents, No. 1 unbleached at 3.75 cents and kraft of No. 1 grade at 3.25 cents. There is little demand and current trade is within unimportant compass.

RAGS. — The papermaking rag market rules dull. Consuming mills are doing little buying aside from small lots at spasmodic intervals needed for direct use, and the aggregate volume of stock moving is negligible. Dealers argue that prices are at levels where there is scarcely no profit in grading and packing rags, and a good many sorting concerns are said to have materially reduced their operations, yet prices still display a weak tone and are gradually touching

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lower levels. Some dealers are refusing to sell at prevailing prices, feeling that when buying interest among paper mills improves prices will quickly rise, but others, evidently not in so favorable a financial condition, are accepting orders and buyers are occasioned no great difficulty in getting all the rags wanted at the prices they bid. No. 1 white shirt cuttings are offered to mills at 9 cents a pound at shipping points, fancy shirt cuttings at 5.50 cents, washables at 4.50 cents, blue overall cuttings at 5.50 cents, No. 1 old repacked whites at 5 cents, repacked thirds and blues at 1.75 cents and No. 1 roofing rags at 75 to 80 cents a hundred.

PAPER STOCK. — Trade in old paper, as regards all grades is light. There are several desciptions of stock moving in fairly regular fashion and consumers seem willing to take all of this material offered within reasonable price limits, but the market as a whole is quiet, and there is no single grade in keen enough demand to send prices up. In fact, the tendency of quotations is downward, and buyers frequently are securing wanted supplies at less than the figures asked by sellers. No. 1 hard white shavings have sold this week at 2.75 cents a pound New York, denoting a decline, and soft white shavings of No. 1 quality are offered with more freedom by dealers at 1.90 cents, while white news cuttings have sold at 1.50 cents. Folded newspapers continue to command no more than 35 to 37½ cents a hundred New York, and No. 1 mixed papers 30 cents.

OLD ROPE AND BAGGING. — Mill orders are in the market for No. 1 domestic manila rope af 4 cents a pound at shipping points, and in some quarters it is stated this price has been exceeded slightly. There is a fair call for old rope and indications are no sizeable accumulations exist in the supply trade. Old bagging is in a dull market position and so few transactions are recorded that prices are nominal.

GEARS MADE OF PAPER.

There is a general disposition among manufacturers to hesitate about installing "silent" gears, because, in so many cases, they give short and inefficient service thus costing more in the long run.

There is a silent gear on the market, now, however, manufactured by a Canadian company, (The Diamond State Fibre Company of Canada, Limited) which besides being waterproof and oil proof gives long and efficient service at a very lo wcost. These gears are made from a special grade of dense fibre of relatively high specific gravity, or with a canvas base which is adapted for all kinds of gears from the small sizes used in vacuum cleaners, silk and knitting machinery, etc., to the heavy service pinions used on machine and motor drives. Installed in a gear-drive they combine the efficiency and regularity of an all-metal gear-drive with the silent, smooth operation of a belt transmission. Their initial cost, too, is generally lower than the cost of other gears so that it looks as if they would fill a long felt want in the manufacturing world.

The crying evil of the young man who enters the business world to-day is the lack of application, preparation, thoroughness, with ambition but without the willingness to struggle to gain his desired end.—Theodore N. Vail.

SOME FORGOTTEN FACTS ABOUT HOURS OF LABOUR.

By DR. W. A. EVANS,
Of Chicago Tribune Department of How to Keep Well.

At to hours of labor, the experience of the war taught us two things. One was that excessive hours of work resulted in lessened rather than increased production. In simpler phrase, where men worked twelve hours each day for seven days a week they actually produced less than when they worked fewer hours.

A British foreman said of Sunday work in the munitions factories during the earlier days of the World's War: "It gave six days' output for seven days' work and eight day's pay." Has any economist said it better? Is not this epigrammatic summing up entitled to live?

A hard and fast eight-hour day for men, women and children, regardless of the kind of work engaged in, was not founded on physiological or health considerations. Some can work more than eight hours with advantage to their health. Others cannot work eight hours. Some tasks cannot be worked at for more than eight hours with advantage of health.

The reports of the various commissions on health of munition workers and commissions to study fatigue are scientific and valuable. The American Journal of Public Health quotes R. N. Hutton, of Toronto, as saying that the chief factor in fatigue is the adaptation of the worker to his job.

The tendency is to blame the employer and the factory for over-fatigue of employes and for all the ill-health of employes developing both inside and outside the factory. It is out of the ordinary when an advisory councillor for scientific and industrial research on fatigue places the man first and the environment second.

The man who is badly adapted to his job either physically or mentally fatigues quickly, and not only fails to produce much during some of the hours for which he is paid but he goes home at night worn out, irritable, on edge, dissatisfied and a prey to disease.

Other causes of fatigue contributed by the employe in addition to poor adaptation are personal worries, age and poor health, including poor physical development. mong the factors that the employer had to do with are hours of labor, ventilation, light, space, conditions of the air as regards temperature, humidity and cleanliness, also speed rhythm, rest periods, health hazards.

NEW MAGAZINE GRINDER.

Within the next two months there will be in operation at the Black River Mill of the St. Regis Paper Company, of Watertown, N.Y., a new type of magazine pulp wood grinder, which is considered by manufacturers of ground wood pulp in this section to be a great improvement over any of the magazine grinders now on the market. It is the invention of John J. Warren, third vice-president and technical adviser of the company, and will make it possible to increase the daily production of ground wood at that plant about thirty tons per day.

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Some people can't stand prosperity. The horn of plenty has started many a man on a toot.

Pulp and Paper Magazine

OF CANADA

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

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The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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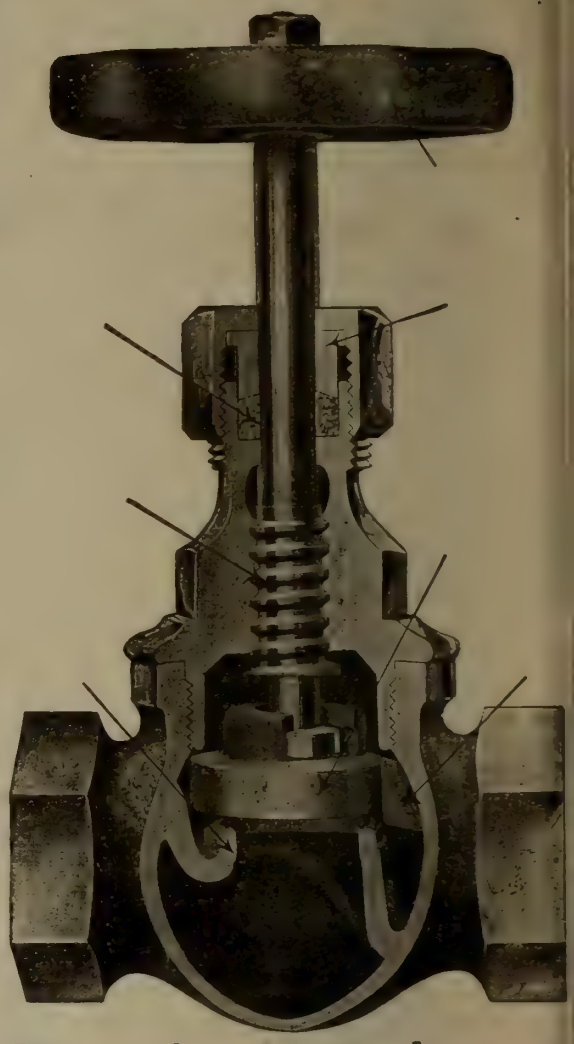
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EDITORIAL

THE HEALTH OF THE CHILDREN.

Notwithstanding the many truthful things that have been said with regard to the value and extent of Canada's natural resources, the fact remains that the greatest resource of any nation is the health, energy, skill and intelligence of the people. The most important of these factors is health because without a sound body it is difficult to attain the other qualities. It is a mark of progress in a nation to organize departments of public health, national, provincial and municipal. Other nations have taken such steps considerably in advance of such action in Canada but it is gratifying to note the energetic way in which Canadians, particularly the Province of Quebec, are attacking the problem.

Some Canadian cities have had a particularly unfavorable record for infant mortality and so called social diseases have been unfortunately prevalent. There is a close connection between these two conditions. When the present Premier, Hon. L. A. Taschereau, assumed office, one of his first statements was that the Province through the Department of Health, would organize the attack on infant mortality, tuberculosis and venereal diseases. The principal agency in this battle is education. The very unfortunately large number of young children who die can be attributed very largely to a lack of knowledge on the part of the parents of the most elementary principles of child welfare. Educational pamphlets are being prepared and distributed for the benefit of those who do not realize the harmful effects of many prevalent customs and many simple matters that are largely neglected.

In addition to this provincial effort, the Child Welfare Association will inaugurate early next month a Child Welfare Train which will tour the Province of Quebec for at least one month. There will be two coaches, one for the headquarters of the staff of doctors, nurses and clerks, and one car devoted to exhibitions, demonstrations, conferences, etc., the work being carried on both in French and English. Besides the examination of children from babyhood to the age of 14, and advice to parents in consequence, there will be motion pictures, distribution of literature and instruction in the rudiments of Child Welfare. The service of this train, which is made possible through the generosity and co-operation of the Canadian Pacific Railway, is entirely free. Among the towns to be visited there are at least 12 where pulp and paper plants are established and we trust that the management and the employees in these mills will lend their assistance and encouragement to the good work which such a train is attempting to accomplish.

It is fortunate indeed that the authorities, recognizing the importance of Child Health as the foundation for an efficient and intelligent nation, have begun activities along this line. Healthy childhood however, can not be built successfully without healthy parents, which makes it necessary to consider in connection with child health and welfare the other two contributing problems included in the provincial health program. Here again education is the great factor although in the case of tuberculosis there is need of the opportunity of getting sunshine and fresh air and healthful employment, and in the case of the social problem we have not only to consider education but to encourage strength of character.

Matters of this kind, involving, as they do, personal feeling, present delicate and difficult problems to handle but the health of the community, while it cannot be said to be more important than the health of the individual because it is the health of the individuals, must be conserved by all proper means. If therefore, vice, intemperance, illiteracy, marriage of defectives, etc., threaten to undermine this important national asset, the face and force of the nation must be firmly set to the elimination of these under-mining influences.

The authorities, who are intelligently and courageously doing their part to improve conditions of health and morality, are not only to be sincerely congratulated for their efforts but every industry and every individual in the Dominion should be pledged to the support of such measures as may be inaugurated for the bringing about of better conditions in our country.

FROM SHIRT SLEEVES TO SHIRT SLEEVES.

It is a common remark that from shirt sleeves to shirt sleeves is three generations, meaning that the grandfather has started with nothing and by his energy has established a business which is developed by his son into a very profitable venture and passed on to the grandson, who, because of his father's wealth has not learned the lesson of industry, and becomes incapable of carrying on the enterprise and squanders the inheritance, thus bringing thet line relatively back to the starting point.

It seems to us that there is a somewhat similar danger in the distribution of the German indemnities. Estimates have put the amount due to Canada from this source as about $600,000,000. That is a very large amount and the disposition of it is a matter which demands the very greatest care and consideration. To hand out indiscriminately a proportion of this to each Canadian citizen would not only be difficult but foolish. In the first place we believe it is safe to say that

the majority of adult Canadians did not earn the $200 or $300 which would thus be coming as their share, while, on the other hand, there are a great many in this country who are much better off in every way than in 1914. Furthermore, no one will dispute the statement that no amount of indemnity will compensate for the loss of the 50,000 lives sacrificed for the safety of the nation, the Empire and the world. It is only in part also that money can make up for the loss of a hand or an eye and money can but supply the bodily needs of those who are now incapacitated for self-support. It seems to us, therefore, that the only just distribution of any indemnity will be in providing as far as possible for the financial needs of those whose earning powers have been impaired and in substituting for those who had previously been the providers. By this we mean that any monies thus received should be invested so as to pay dividends to such dependents, comparable with not only their former earning power and incomes, but taking into account also, increasing ability and larger needs as families grow up until children become self-supporting. We believe that deliberately to hand out any considerable sum of money to able bodied young men is a handicap and a weakening influence rather than a help. We believe it is only by exercise and struggling that strength is developed and the nation needs vigorous well developed brain and muscle for the work that lies ahead.

Very likely the payments (if any) on the indemnity account will be used for reducing our own national debt but we believe the equivalent should be carried to provide suitable incomes for those who have suffered and not that any national advantage should accrue. We believe that a national struggle to win out through our own efforts in competition with the defeated nations who have been compelled through force of circumstances to do their utmost, will be a good thing for Canada. On the other hand any temporary good gained by the distribution of indemnities is likely to become an artificial prop which will make it all the more difficult for us to stand against competition later on, while our rivals will have been benefiting by the extra efforts and economies that they have been forced to practice.

COBWEBS.

The Spanish River News for July 9 has a picture of Miss Rowan and Miss Collins "enjoying a two-some picnic". From their looks it was evidently also toothsome. Miss Collins is on the staff of abstractors for the Technical Section.

The Semi-Weekly Post of Thorold made up some stock from a local paper mill into examination pads, etc. The Post appeals to readers to use a community product. More of that spirit, especially when it spreads to the public would help Canadians in many ways.

At least four firms in the United States and Canada have built paper machines to run at 1000 feet per minute, or better. This indicates a general advance in engineering and construction ability in keeping with the other forward developments of the pulp and paper industry.

One is surprised to see Bartholdi's statue of Liberty used as a trade mark by the "Statue" Printing Works, Leeds, Eng.

Good night! The government of Siam is going to establish an experimental paper mill. This is for the special information of those who oppose a properly equipped and organized research institute for Canada.

The American Writing Paper Company moved a paper machine from Holyoke to Chicago as a part of their exhibit in the Graphic Arts show this week. The machine is only about 9 feet long, but it makes real paper 5½ inches wide.

A rather unusual incident of the convention of the American Federation of Labor was the adoption by that body of the report of the minority of the committee as a declaration on railroad legislation.

The Shawinigan Falls Review puts it up to its readers to protect their jobs by preventing fire in the forests. If everyone is careful, there will be a decrease of 90 per cent in the number of forest fires.

A SAFETY ALPHABET.

(From Common Sense.)

Accidents are somebody's fault.
Before crossing tracks, stop, look and listen.
Co-operation is the secret of Safety First,
Daredevils are usually killed.
Educational safety work is very important.
Falls kill many persons.
Great pains from little injuries grow.
Habit controls our lives; adopt careful habits.
Injuries disable millions.
Jay walking may cost you your life.
Keep children out of the street.
Loose clothing should not be worn around machinery.
Matches are unsafe playthings.
Never take a chance
Obey that safety warning.
Queer how careless we all are.
Protect yourself by practising safety.
Read Common Sense
Step back when a tree starts to fall.
Thinking is the key to safety.
Unless you help us fight carelessness, it will sooner or later get you.
Vigilance is the mother of safety.
With co-operation we will put safety over.
Xercise precaution when in doubt.
You, think of those dear ones at home.
Zones of safety protect you. Use them.

—Apologies to U. R. and E Co., Baltimore, Md.

Decay in Pulp and Pulp Wood

"For nearly two years, the United States Forest Products Laboratory at Madison has been making a jointly by the Laboratory and the paper industry," says a letter from the Information Service of the American Pulp and Paper Association; and the experimental work has been completed. Owing to the large quantities of wood pulp now in storage, it has been deemed advisable to publish at once a preliminary report of results of this exhaustive study, without waiting for the preparation of the complete detailed report. The complete report will later be published in pamphlet form by the American Paper and Pulp Association. Meanwhile, however, the Association is sending out the preliminary report given below, in order to make available at once the means for preventing great losses by decay during the present summer."

A contribution has also been received from Dr John S. Bates, discribing results of mill size tests carried on at the plant of Price Bros. & Co., it will appear in an early issue.

In August, 1919, the Forest Products Laboratory, cooperating with the Bureau of Plant Industry, United States Department of Agriculture, started an investigation of the deterioration under commercial storage conditions of wood and pulp used in the manufacture of paper and fibre products. This was done at the urgent request of mill operators who were suffering heavy losses, particularly in the storage of groundwood pulp. In February, 1920, an adequate fund for continuance of the study was subscribed by a group of mills, mainly located in Wisconsin and Minnesota but ranging as far east as Maine. The study has now progressed for nearly two years.

The major features upon which the attention of the laboratory have been focused have been the improvement of wood storage practices and the preservation of stored pulp. Prevention of decay and molding in stored pulp has been attempted by adding antiseptics to the pulp as it goes over the wet machine, or, as in the case of much of our experimental work, by adding the chemicals to the wet laps after removal from the wet machine. The present paper deals only with these preservative treatments.

The preservative action of 106 different chemicals has been investigated. In selecting these their cheapness as well as their probable efficiency were taken into consideration, but a considerable number were included solely because of their comparatively low cost.

In appying these chemicals the principal laboratory method consisted in running off on a small wet machine laps of fresh groundwood pulp about 21 inches long and 12 to 14 inches wide. After the ends were trimmed, these were laid out in groups of ten and sprayed on both sides by means of an ordinary 2½ gallon compressed air garden sprayer operated by hand.

The concentration of solution used depended in large part on the solubility of the chemical, but where the antiseptic value was doubtful and the substance easily water soluble in the desired amount 5 per cent. solutions were used in the preliminary tests. In later tests on substances which looked promising the concentrations were in many cases reduced.

Moisture determinations on the laps showed them to be about 30 per cent. dry before spraying.

The laps were separated into bundles of seven and three, respectively, the bundles being weighed both before and after spraying in order to determine the amount of solution absorbed. These data, however, were not secured for the first three series comprising about 300 laps.

Although the amount of solution used was measured, the quantity of chemical actually absorbed was determined by the increase in weight of the bundles after spraying, since a considerable amount of preservative was lost during the process of application.

Each bundle of seven laps was inoculated profusely with a mixture of mold spores by shaking a heavy water suspension of the spores upon the laps from an antomizer bottle immediately after spraying. The bundle of laps was then folded once.

Each bundle of three laps was inoculated with wood-destroying fungi only, using five pieces originally isolated from decayed pulp. These fungi were grown on agar in petri dishes and small squares of the agar with growing fungus were applied to the surface of the laps at five points in each two laps. These bundles were also folded once.

At the end of a day's run the bundles of laps were taken to a storage house in which the air was kept highly humid and the temperature regulated around 72° to 75° F. The bundles of seven were for the first few months closely stacked on narrow shelves with one or more untreated laps separating the treated bundles. Occasional bundles of untreated test laps were interspersed to serve as checks or blanks.

For the last ten months of the test, however, the bundles were repiled with thick laps of very rotten hydraulic-pressed pulp separating each layer so as to give a more severe infection.

The bundles of three, inoculated only with wood-destroying fungi, were piled on separate shelves, separated only by laps of clean untreated pulp.

Tests on the more promising preservatives have been repeated several times using the same or lower concentrations. In addition to the laboratory tests a small semi-commercial test involving about one ton of wet pulp was made at a Wisconsin mill, treating usually three laps with a given preservative or concentration on the wet machine by dripping the solution on the pulp just before it reached the press rolls.

In all, about 3,000 small groundwood and 1,400 small sulphite laps have been tested in addition to sixty-one commercial laps treated at the mill, not more than 220 lbs, for any one test.

The mill tests have now run six months and the older laboratory tests date back to August, 1919, while the latest had been runnnig nearly eleven months at the time of the last inspection.

Of the 106 chemicals tried, seven had proven worthy of mention at this time. A discussion of these follows:

BORAX

This is a white substance 5.3 per cent. soluble in water at 70° F., or 7.4 per cent at 86° F. It is non-poisonous and therefore safe for workmen to handle. It slightly darkens the pulp, but not to an objectionable degree.

The small laps treated with 5 per cent. solution contained approximately one pound of chemical per 100 pounds of wet pulp; those treated with 10 per cent. solution, contained up to 1.7 pounds.

Results.

The 5 per cent. solution applied at the laboratory held the pulp in good condition (slightly molded in a few cases) for six to eight months. The 10 per cent. solution kept it clean or nearly so for six months.

After thirteen to fifteen months the 5 per cent. treatments were in fairly good condition, although some mold and probably wood-destroying fungi were present.

The 10 per cent solution showed no particular advantage over the 5 per cent.

The mill tests with a 5 per cent. solution dripped on the pulp back of the press rolls were not as favorable, since the pulp was severely stained with blue-black molds within six months. This may be due to the actual concentration of the chemical in the pulp being considerably lessened by the method of application, the chemical being partly lost in the white water at the press rolls.

BORIC ACID

This is a colorless substance 4.8 per cent. soluble in water at 68° F. It is non-poisonous and safe to use, although more expensive than borax. It gives a slight pinkish-brown color to groundwood.

The pulp contained from 0.7 to 1.2 pounds dry chemical per 100 pounds wet pulp.

Results

The pulp was somewhat molded after six months, but in fairly good condition. After twelve to thirteen months it was still in fair condition with no active decay present.

SODIUM FLUORIDE

This is a white salt 4.3 per cent. soluble in water at 64° F. It is perfectly safe for workmen to handle and produces no chemical discoloration in the pulp.

The small laps treated with 3 per cent. solution contained approximately 0.6 lb. of chemical per 100 pounds wet pulp; the 5 per cent. treatments contained about 0.9 lb.

Results

The 3 per cent. solution preserved the pulp very well, permitting only slight molding after one year. Part of the pulp at the mill was somewhat molded after six months, but not seriously.

The 5 per cent. solution held it nearly clean for twelve months except in one case, in which the pulp was badly molded and somewhat decayed.

The 1 and 2 per cent. solutions at the mill gave somewhat variable results, the pulp in some cases being only slightly blue-black molded, and in other cases rather badly so. It was, however, free from decay.

SODIUM DINITROPHENOLATE.

This is a yellow salt producing a yellow solution. It is approximately 2.4 per cent. soluble in water at 59° F. While in concentrated form it is considered an industrial poison, it is not thought that it will injure the health of workmen in the dilution recommended, provided reasonable care be exercised. It colors the pulp slightly yellow in the lower, and distinctly yellow in the higher concentrations. This color readily washes out, but the washed pulp may be somewhat darker than normal.

The pulp contained approximately the following amounts of dry salt per 100 lbs. wet pulp:

1/16 %	concentration	.015 lb.
1/8 %	"	.025 lb.
¼ %	"	.06 lb.
½ %	"	.08-0.1 lb.
1 %	"	0.14 to 0.2 lb.

Results.

One-sixteenth per cent. concentration partially protected for twelve to thirteen months.

One fifteenth per cent. concentration at the mill permitted a small amount of blue-back mold in six months.

One-tenth per cent. at the mill permitted a little mold and decay in six months.

One-eighth per cent. kept the pulp clean or nearly clean condition for twelve to thirteen months.

Two-fifteenths per cent. at the mill held it in fairly good condition for six months.

One-fourth per cent. preserved completely for six months. In one case there was considerable decay in thirteen months in the groundwood, although the sulphite remained clean. At this concentration the pulp is discolored a rather deep yellow.

One-half per cent. preserved well for six months, but permitted a little molding and decay in twelve to thirteen months.

One per cent. almost completely preserved for thirteen months.

SODIUM DICHROMATE

This is a reddish brown substance readily soluble in cold water and yielding an orange-yellow solution. It immediately stains the pulp slightly yellow but on standing this becomes brownish, darkening the pulp somewhat when applied in a 2 per cent. concentration. It is classed as a poison but is not considered dangerous to handle.

Pulp treated with ½ per cent. solution contained about 0.1 dry salt per 100 lbs. wet pulp; that treated with 1 per cent solution 0.2 to 0.24 lb.; with 2 per cent. solution about 0.4 lb.

Results

One-half per cent. solution preserved the pulp for about three months but failed in six months.

The one per cent. solution kept it in rather good condition for six months but failed in thirteen months, except in the case of sulphite pulp. The slight darkening effect is not objectionabe.

The six months test using a 1 per cent solution at the mill was very favorable, with only slight molding.

The 2 per cent. solution kept the pulp clean or nearly so for five to six months, but largely failed from mold and decay after twelve to fifteen months, although the sulphite held up better than groundwood. The six months' mill test was very favorable.

SODIUM CARBONATE.

This is a white salt readily soluble in cold water. It is a fairly strong alkali, consequently browning the pulp to a marked degree. This color readily bleaches out, however, in the case of sulphite pulp, without increased bleach consumption, but the pulp is somewhat softened from the action of the alkali.

The sulphite pulp treated with 5 per cent. solution contained 1.2 lb. of chemical per 100 lbs. wet pulp. No data are available on groundwood.

Groundwood treated with 7 per cent. solution contained 1.5 lb. of chemical.

Pulp treated with 10 per cent. solution contained 2 lbs. of chemical.

Results

In general, the 5 per cent. solution kept the pulp in clean or nearly clean condition for a year, but in the two earlier series it became molded and rotted after twenty-one months.

The 7 per cent. solution held the pulp nearly clean for thirteen months.

The results on the 10 per cent solution were likewise favorable. After twelve to fifteen months the pulp varied from clean to somewhat molded, with traces of decay in some cases.

SODIUM BICARBONATE

This is the ordinary white baking soda. It is soluble up to about 8½ per cent. in cold water. It browns the pulp the same as sodium carbonate and also apparently softens it.

Pulp treated with 5 per cent. solution contained 1.1 to 1.2 pounds of chemical per 100 pounds wet pulp. That treated with 10 per cent. solution contained 1.9 to 2.3 lbs.

Results.

In general, the 5 per cent. solution was about as effective as 5 per cent. sodium carbonate.

Pulp treated with 10 per cent. solution was clean or only slightly attacked by fungi after one year. The first series was in bad condition, however, after twenty-one months.

In considering the pulp preservation question it may be well to mention that neither fresh nor waste sulphite liquor have proved satisfactory, nor has bleach liquor, under the severe conditions imposed in the laboratory tests.

A few other substances not yet manufactured on a commercial scale, but tested only under mill conditions over a six months' period, have proven highly efficient and should be given more rigid investigation provided they could be prepared in commercial quantities.

GENERAL DISCUSSION OF PRESERVATIVES.

In selecting a suitable preservative several things besides effectiveness as an antiseptic, must be given consideration, such as:

1. Poisonous properties.
2. Objectionable chemical discolorations.
3. Objectionable odors affecting the workmen.
4. Solubility in cold water.
5. Cheapness.

Some substances which are quite efficient as antiseptics must necessarily be ruled out of commercial use because, in handling either the solutions or sprayed pulp, sufficient quantities of the poison may be absorbed through the skin to impair the health of the workmen. Likewise, violent poisons which might accidentally enter the body through the mouth must be avoided in order to protect the consumer. Examples of such dangerous substances are mercuric chloride (corrosive sublimate), sodium arsenate, sodium cyanide, etc.

Some highly efficient antiseptics produce objectionable discolorations in the treated pulp, due either to the color of the chemical or its caustic or other action on the wood fibre. All of the alkalis produce browning, the depth of which depends on the substance used and the concentration of the solution employed. For instance, borax produces a slight browning but not sufficient to be objectionable, while both sodium carbonate and sodium bicarbonate will distinctly darken the pulp; too much for successful use commercially.

Sodium dichromate likewise ultimately browns the pulp considerably when applied as a 2 per cent. solution and above, and some mills might object to it on this score. In the single mill test made, however, the superintendent thought it would be satisfactory.

Sodium dinitrophenolate is apparently not adapted to commercial use on groundwood in concentrations above ⅛ per cent. Even at ⅛ per cent. the yellow tinting is distinctly noticeable, but it readily leaves the pulp on washing.

None of the substances mentioned have objectionable odors, but some of the chemicals experimented with are open to this objection.

Solubility in cold water is a very important factor, as, in most cases the chemicals are most easily applied in the form of water solutions. The solutions should be applied on the press roll. The concentration employed should be sufficiently high to reduce the amount of water applied to a point where it will not interfere with the removal of the laps from wood rolls. In the case of such substances as borax or boric acid, where the solubility in cool water is limited to 5½ to 6 per cent., careful adjustment of the rate of flow will be necessary in order to apply the required amount of dry chemical and at the same time reduce the amount of water to a minimum.

With a brass roll there is little danger of the pulp sticking to the roll.

When the solution is applied back of the press roll the loss in antiseptic is too great, it being squeezed out with the excess water at the roll. Tentative tests made on the experimental wet machine at the Forests Products Laboratory indicate that only about 40 per cent. of the chemical applied is thus retained by the pulp. This difficulty can be partly overcome by applying a more concentrated solution to the pulp press roll. When so applied the retention is about 70 per cent, with a 5 per cent. solution and 74 per cent. with a 2 per cent. solution.

In applying preservative solutions this loss of 25 to 30 per cent. must be compensated for in order to secure the actual concentration of the chemical in the pulp which is necessary for preservation.

In interpreting the results presented in this paper it should be kept in mind that the preservative applied in the laboratory tests was all retained, while in the mill tests in all probability 50 per cent. or more was lost in the white water.

Outside of technical difficulties in application the deciding factor in the use of any chemical from a commercial standpoint is the cost and the laboratory workers have had this constantly in mind.

Assuming that the pulp normally leaves the wet machine one-third dry, in order to secure the retention indicated in the laboratory tests outlined above (after compensating for the loss of chemical in the white water) the amount of dry chemical applied at the press roll per ton of air dry pulp would be as follows:

Strength of Solution	
5 per cent.	80 lbs. per ton
3 per cent.	48 lbs. per ton.
2 per cent.	32 lbs. per ton.
1 per cent.	16 lbs. per ton.
⅛ per cent.	2 lbs. per ton.

The market quotations on the chemicals which seem best adapted for commercial use, as taken from the June issue of the "Oil, Paint and Drug Reporter" and verified by quotations by telegraph from manufacturers, would place the chemical cost of treatment per ton of air dry pulp as follows:

Borax at 5½c in 3 % solution	$4.40
Boric acid at 13¼c in 5 % solution	10.60
Sodium fluoride at 12c in 3 % solution	5.76
Sodium dinitrophenolate at 75c in ⅛ soln.	1.50
Sodium dichromate at 8½c in 1 % solution	1.36

A number of mills manufacturing pulp were recently circularized by the Laboratory in order to gain some idea as to the additional expense they would consider commercially feasible in safe-guarding their pulp which is to be stored for any considerable time. Replies were received from twenty-three. The estimates of the nine companies submitting definite figures varied from $1.25 to $5-$6 per ton, under present commercial prices, the average for maximum figures being about $3.50. On this basis only two of the preservatives suggested would be available, unless mill tests should further demonstrate that lower concentrations could be used, and this is altogether a possibility under improved methods of applying the preservatives so that a greater amount will be retained by the pulp. Likewise greater attention to improving sanitary conditions in storage will assist in keeping down fungus infections, such as, for instance, the use of clean concrete bases upon which to pile, the removal of all rotting debris from the vicinity of piles and close attention to see that no infecting material, such as bits of infected wood, planks or sticks which have been in contact with the soil be introduced into the piles. This latter is highly important, as the least bit of infected wood or other debris mixed in with the laps will serve as a center of infection which may eventually destroy large sections of a pile.

CONCLUSIONS

Judging from the antiseptic efficiency and freedom from other objectionable features sodium fluoride appears to have given the best results of those preservatives reported upon.

Borax follows a close second.

Boric (boracic) acid is equal or somewhat superior to borax but the greater cost throws it out of competition.

Sodium dinitrophenolate in ⅛ per cent. concentration appears very promising, with an antiseptic efficiency equal to anything tried, but the yellowish chemical discoloration of the pulp may prove objectionable for some purposes. This readily washes out, however, although it may leave the pulp somewhat browner than normal.

Sodium dichromate appears to be less favorable than the four above mentioned substances as the antiseptic efficiency varied rather too widely in the tests and the tendency toward browning, and possible softening, of the pulp is rather marked, particularly in concentrations of 2 per cent. and above.

Sodium carbonate and bicarbonate, while quite efficient in 5 per cent. solutions, brown and soften the pulp too seriously for commercial use.

RECOMMENDATIONS FOR FURTHER WORK.

Actual mill tests on not less than 500. lbs of wet pulp should be made on each of the above preservatives, applying them at the press roll and wherever possible in higher concentrations than formerly so as to reduce losses in the white water. In addition to these there are a few other substances which appear promising but which have not yet been sufficiently tested to report upon.

This work is entirely dependent upon mill cooperation and must necessarily be financed by them, as the fund previously set aside for the pulp deterioration study is now exhausted.

A list of manufacturers, taken from the Chemical Engineering Catalogue, who can supply the various chemicals described, can be secured by request from the American Paper and Pulp Association.

SWEDEN'S FOREST PRODUCTS.

A very interesting book entitled "Sweden as a Producer of Wood, Woodpulp, Paper, Tar and other Forest Products" has been published by A. B. Svensk Teknolog, Foreningens Forlag, Stockholm, and distributed through the Swedish Journal of Commerce, New York City. The contents refer to and are classified according to the Wood Goods Industry, the Joinery Industry, Woodpulp, Cellulose, Paper, etc. This publication gives in concise form much valuable information regarding the Swedish industries dependent upon the forest. Numerous tables not only give the production of these various materials according to the class of the product and the name and address of the manufacturer but also gives certain comparisons of the Swedish resources and developments with those of other countries. At the end of the book there are interesting descriptions of a number of Sweden's more important manufacturing establishments. These are very nicely illustrated with interior and exterior pictures of the mills. There is also a map of Sweden showing the location of 185 pulp and paper mills. The book is in English with the main headings of tables given also in French and Spanish. We wish to take this opportunity to thank the publishers and the Swedish Chamber of Commerce for their courtesy.

CHEMICAL EXPOSITION WILL BE HUGE.

That the coming National Chemical Exposition — the Seventh — will be the greatest in the history of the chemical industry of the Continent is no longer doubted. The show will be hed in the Eighth Coast Artillery Armory, New York City, during the week of September 12, and every inch of space will be devoted to showing the progress of chemical research in America. This, as is well known, has astonished the scientific world in the past five years, for before the world war America held only a minor place in the Chemical Hall of Fame.

Thus far more than 400 exhibitors will have places in the exposition. Last year the total was 457, and before the books are closed for the 1921 show Fred W. Payne, who with Chas. F. Roth, is managing the exposition, expects that last year's figures will be exceeded. It is certain that every branch of chemistry will be represented and that the public will be introduced to many new and important phases of chemical development.

Inasmuch as all manufacturers use chemicals or chemical machinery in some form, it is only natural that they should desife to witness a display that offers all that is most modern in their requirements.

Messrs. James A. Conners and William H. Wentworth of the James W. Sewall forest engineering office, of Old Town, Maine and Washington, D.C., were in attendance at the Quebec Limit Holders meeting at Montreal this last week. They exhibited specimen data of the work Mr. Sewall is doing for McLachlin Brothers, Limited, Armprior, Ontario. This consists in a detailed cruise and mapping of the McLachlin lands in Ontario and Quebec, an area of about 1,000,000 acres.

The last dividends reported for 30 representative German paper mills ran from 0 to 60 per cent. A great many companies have largely increased their capitalization.

Forestry in Finland

By EDWARD BECK, Publicity Department, Canadian Pulp and Paper Association.

Helsingfors, Finland, June 23. — Finland, perhaps more than Sweden, is dependent upon her forest resources. As in Sweden, the people appreciate the importance of maintaining and increasing these resources, although this realization, as interpretated into practical usage and protective legislation, dates back less than a quarter of a century. Before that time Finnish forests were largely allowed to take care of themselves.

During the last twenty-five years laws, based upon those of Sweden, have been enacted and are now rigidly enforced. State and private owners of forests co-operate together in building up and maintaining the forests and in employing means for their perpetuation.

The practice of reforestation on a broad scale is carried on almost universally, except in the more northerly parts of the country where there is still much wild land. Finnish forest methods, however, are generally based upon the theory that it is better to let nature do the work where possible and to use artificial means only where necessary, and most of the cutting is done with that end in view. Some fine examples of natural forests from 60 to 80 years old are to be seen.

Here, as in Sweden, the private owners put their forestry and logging operations under a single supervision and management. The chief forester directs how and what trees shall be cut, always with the object of impairing the growing forest as little as possible, and following the cutting operations when necessary with replanting. Most of the companies buy timber in addition to cutting their own. They maintain separate organizations to deal with bought timber but the same requirements as to replanting is made to apply.

The extent of the forest organizations built up and maintained by the companies may be illustrated by that of the Kymmene Aktiebolag, one of Finland's largest pulp and paper companies, which owns over 600,000 acres of forest lands scattered over a wide area. This company employs a chief forester, nine district chiefs, 100 foremen and the necessary laborers, all of whom devote their entire time to forest operations. The chief forester and the district chiefs are well paid and are each provided with a home which is also the forest headquarters for the district. All the chiefs are trained foresters and have been through the technical schools established for that purpose. This company has also accomplished what few state or private owners have succeeded in doing in having made a complete survey of their forests and learning to a certainty the amount of available timber, the annual growth and all other details. By means of this survey they have been enabled to map out their forest program for years in advance.

Finland's total area comprises approximately 144,250 square miles, of which about 17,000 square miles, or 11.75 per cent consist of inland waters. More than one-half of the land area is made up of forests. There are about 73,000 square miles which produce merchantable timber of which about 58,000 square miles are classed as highly productive. About one-third of Finland's land area lies north of the Arctic circle and includes most of the less productive forests.

In Finland the State owns about 38 per cent of all the land, including 20,000 square miles of productive forests. (There are private companies in Canada which control a considerably larger forest area.) Private companies own a greater proportion of the best forests, their holdings approximating 38,000 square miles. The State sells the standing timber on its holdings by methods similar to Sweden's and makes adequate provision for its replacement. Private owners are restricted as to the uses of their forests and are not allowed to cut in any manner that is considered injurious to future development. When they cut the land clean, as they sometimes do, they are obliged to replant it.

Selective cutting is generally practiced, the trees being taken out with due regard to the effect produced on those left standing. Drainage is resorted to for the purpose of increasing production, and thinning is carried out in a scientific manner at necessary intervals. Fire hazards have been reduced to a minimum and the fire losses, compared with those in Canada, are practically negligible.

Pine and spruce form the basis of most of the forests with an admixture of birch and other hardwood species. No authentic survey of the timber resources of Finland is available, although there are several estimates which are held to be reliable. One, made by Col. Gosta, Serlachius, president of the Finska Cellulosa-forcumigen, places the timber resources of the country at approximately 31,000,000,000, cubic feet (335,000,000 cords). Calculations made on the assumption of an annual growth of 1.5 per cent. which has been shown to be below the actual, indicates a yearly timber yield for the entire country of 15,650,000 cords.

Finland's present timber requirements for all purposes, domestic and industrial, are drawn chiefly from a territory which includes rather less than three-fourths of the total forest area of the country. This territory, however, represents a considerably larger part of the actual timber resources. It is estimated that from 20 to 25 per cent of the total standing timber of the country may be clased as merchantable material of sawlog dimensions.

In normal years Finland exports about 300,000,000 cubic feet of timber and sawn lumber. (There are approximately 375 sawmills in Finland, many of which, however, are of very limited capacity). The wood pulp industry produces 220,000 tons of mechanical and 350,000 tons of chemical pulp a year, using up about 900,000 cords of wood in the process. The consumption of timber for domestic requirements, including industrial and railway fuel (All locomotives here burn wood) has been estimated at 5,000,000 cords a year, much of which is hardwood, principally birch.

These figures indicate on the surface that Finland is using every year an amount of wood equal to or exceeding the estimated annual growth, although in reality, especially when active reforestation is taken into account, the annual increment is considerably greater. It has been estimated that the forest resources of Finland are sufficient to insure a supply of pulpwood for requirements based upon the present rate of consumption for 145 years, without taking into account the new forests that are growing up in the meantime.

During recent years the Finnish government has increased its forest holdings by purchases from private owners, a policy adopted with a view to restoring the productivity of lands exhausted by reckless cutting in the past and of raising the general standard of economic forestry in the country. The most desirable areas of accessible timber lands in Finland are now well taken

up and there is apparently little prospect for industrial companies to increase their holdings by purchasing additional lands from the States. During the unsettled conditions of the past few years there have been many transfers of land among private and corporate owners, with the result that several of the stronger industrial companies have greatly improved their position in this respect. Today, however, the State is doing its utmost to prevent agricultural lands from being bought up by the companies and reverting to forests.

Forest practice and lumbering methods in general, while showing marked improvement in the last fifteen years, are still said to fall somewhat short of the high stage of development reached in Sweden. State supervision and control, as already noted, have been responsible for great improvement in forestry practice and the increasing value of timber has gradually forced a higher standard of efficiency in lumbering methods and the utilization of timber for industrial purposes. In some remote districts there is said to be still much waste of timber by reason of careless lumbering and from fires and other sources, but these are in a fair way of being eliminated.

Timber and water powers constitute Finland's chief national asset, and the lumber, pulp and paper industries are, and must continue to be, the foundation of the entire economic life of the country. The present population of Finland does not exceed 3,500,000. Although 55 per cent of the people are classed as dependent on agriculture, the country as a whole is not self-sustaining as to food. Many peasant farmers engage in lumbering during the winter season and the sale of timber from small peasant holdings constitutes an important part of the annual cut of timber. The growth and present importance of the timber industry is of prime importance to the national welfare. The fact that the Government and the people as a whole fully realize this is shown by the manner in which the forests are now being maintained as well as by the steps that are being taken to ensure their future.

GERMANS BUSY IN BALKANS.

An instance of German penetration if the formation of the Papier-und-Holzstoff-industrie Akt.-Ges. in Zagub. Capitalized at 100,000,000 (the monetary unit not given by Der Papier-Fabrikant, is the Czechoslovak Crown now worth about $.0132.—Ed.) The project is brought about through Dr. A. Miller in Dresden, secretary of the German Commercial Union for the Balkans and the Orient. A model plant will be built in Krapina, 25 miles west of Agram in South Slovakia. Coal,limestone, pyrite and good water are available at or near the mill site. Apparently the whole plant, machines, digesters, electric drive, etc., is to come from Bautzen, Germany.

It is inferred from the article in Der Papier-Fabrikant, June 24, 1921, that this is part of a movement to neutralize, or alienate, French and other "enemy" influence in the Balkans. The article says that there is great building activity in Belgrade and other parts of the country.

WHY WORK OVERTIME?

It is said that it takes 64 muscles of the face to produce a frown, while only 13 muscles will produce a smile.

So after all is said and done it is easier to smile than to frown.

PAPER, ETC. AT THE LONDON EXHIBITION.

From H.M. TRADE COMMISSIONER, Toronto.

In this, as in other industries, the throttling effects of the coal stoppage are being severely felt, and trade has fallen to very small volume. Purchases made are for immediate and urgent needs only, and no improvement can be anticipated until the dispute is settled. At the same time, the belief appears to be firmly established that, given a satisfactory settlement, a material improvement in trade is bound to ensue and that owing to the almost general depletion of stocks business will be brisker than before the stoppage occurred.

In the meantime those mills that are carrying on are finding increasing difficulties, and the numbers closing down and adopting shorter hours are steadily increasing.

Business at the Sixth International Printing, Stationery and Allied Trades Exhibition, held at the Royal Agricultural Hall between 30th April and 14th May failed to reach a fully satisfactory volume. Reports from the different sections varied; while in some sections exhibitors were well pleased with results, in others there was some disappointment. On the whole, however, business was as good as could be expected. The number of exhibitors participating was 226, but of these practically two-thirds were manufacturers of, and agents for, printing machinery and machines for the bookbinding and stationery trades. There was a fair number of American firms represented and one or two French, Swedish and Danish, but the great majority of the exhibitors were British. An outstanding feature of the exhibition was the marked advance shown in the quality and method of production of process plates for various kinds of printing; considerable reduction has been effected in the time required to produce a finished plate ready to go to the press. The process of photogravure also showed improvement, not only in regard to the machinery and appliances used, but in the quality of the resulting intaglio prints.

In the paper and stationery section the exhibits generally were of a high order.

SATISFACTORY SALES.

The individual producer is the one to say what price he must receive for his wares. His business judgment will not permit to ask an excessive profit (that would invite competition and perhaps excess production with destructive results), and he certainly dares not quote prices which cannot return proper compensation to the capital and labor invested in his product.

Satisfactory sales are based on confidence between the buyer and the seller.

It is our belief that prices made effective for specified periods or seasons will establish confidence in prices.—Lakewood Engineering Co.

Direct advertising is a wonderfully flexible business medium, also limitless in its possibilities for illustration, text, color and for typographical effect.—The Dover Type.

Mr. Joseph D. Latno, of the James W. Sewall office, Old Town, Maine and Washington, D.C., with a crew of estimators, is exploring about 500,000 acres of land in northern Maine for the State in connection with arriving at a fair valuation of timberlands for taxation purposes.

The Relation of the Office to the Factory*

By C. N. MOISAN, of Standard Paper Box Co., Ltd., Montreal.

The office is one of the biggest assets of any well regulated business. In the minds of many it is deemed to be an expense but I would rather consider it in the light of a valuable asset.

Its object is not only to take care of all the details incident to a business, but also to keep a close watch on factory production in order to see that a profit shall result from its operation.

It may be said, with truth, that in conjunction with the executive it is the mainspring or brains of most manufacturing concerns.

The methods used in co-ordinating the work of the various departments of a factory, has an important bearing on its production and the hearty co-operation of the office staff and superintendents is quite essential to the success of the business.

The members of the office staff, whose duties bring them into constant contact with the production end, should be very careful of the way matters are handled as between the office and the factory managers so that the best of feeling should exist.

It quite often happens that the factory foremen are diffident about giving technical or other information, but this can be easily overcome by being tactful and patient and showing a desire to make the operators feel that they are all working for a common object.

What is necessary is the co-operative spirit throughout the whole plant, and if such is welcomed, increased production will result, the workmanship will be of the highest order and larger profits are sure to accrue.

Perhaps an illustration of the co-operative spirit might be summed up in this manner.

A General Manager replying to a vote of thanks by one of his Directors said: "We have a very efficient staff taking everything into consideration, a staff we can depend on and there is no bickering to be expected between the office and the factory departments. Each man is out fighting for his own department, but when there is a move proposed in the interest of the whole, he without hesitation gives way and that has helped to a very large extent in minimizing our costs and producing the results we have been able to show for the past few years."

This is the spirit which should actuate every employee who has the business at heart. A few years ago I was standing on a balcony overlooking a factory workshop in company with a group of executives and heads of concerns. Below us were perhaps a hundred men at work. The chief executive noticed a man who was doing something wrong and called out so that everybody could hear him "Here don't do that." Among others who heard this remark were the man's foreman and the factory superintendent.

That incident to my mind has always stood as a capital example of a serious error in management, that is, overstepping the regular lines of authority in the organization of that concern.

One of the best types of business organization resembles that of an army in which the lines of authority carry directly down from top to bottom. The head of a regiment does not direct squad movements. His orders embrace the general movement desired and the orders are repeated to the various companies and platoons by their respective officers.

The authority of the factory manager would be quickly undermined if the workman under him constantly received orders, perhaps contrary to his, from some of the office executives. But the executive who called to the workman from the balcony disregarded this undermining effect on the authority of his factory manager when he shouted "Here, don't do that". This in addition to the needless humiliation of the man before his fellow workmen in the presence of strangers.

It is difficult occasionally to keep from putting one's fingers into the pie, where they do not belong.

Most of us, I suppose, have a lingering memory of the copybook maxim, "If you want a thing done well, do it yourself."

Once upon a time it is possible some one in the office did with his own hands a lot of the jobs that others are doing now. But that is no reason to believe that he is still more expert than they. And if it is found that a workman is doing something palpably wrong, it is the duty of the executive to report the incident to the person responsible for the proper performance of the job.

Harmony should be promoted among the departments especially in connection with the proper execution of orders and if the co-operative spirit prevails, the present reputation of the firm will be further advanced with its customers, and many internal economies will be effected. Sometimes it has been found that the factory managers tend quite unconsciously to favor one part of the work at the expense of the other.

This is due as a rule to the fact that the manager had his training in one department and knows little of the other departments or their relative importance to the entire scheme of the organization.

This naturally throws the business out of balance and the factory end can very nicely overcome the evil by showing a disposition to consult and work with those in authority with a view to bettering the working conditions throughout the plant.

The factory manager can do invaluable work by educating the workmen to endeavor to accept the viewpoint of the executive, because although the management have the right point of view, they cannot themselves be effective unless a majority of the employees look at things in the same light, also it must be borne in mind that in the long run "What is best for all is best for each." Or in the words of the Master, "A House divided against itself is sure to fall."

* Address delivered at the annual meeting of the Canadian Paper Box Makers' Association, Hamilton, Ont., June 1921.

Someone has said that a standpatter in any business is a man that you can't start. And a progressive merchant is one that you can't stop.—The Couchmaker.

British Trade News

(From our London Correspondent.)

Coal Miners Strike Settled and Engineers Make Peace.

Peace now reigns once more—but unfortunately there is still a little unsettled feeling in the paper industry. All this trouble, expense, misery, loss of markets, and unemployment, arose through the process of reducing wages from war rates down to post war rates as the cost of living falls, and the miners stoppage alone has cost the various industries above £180,000,000 and the Government, in addition, £75,000,000. It is hoped Canada will never have such an experience and such a bill to meet. If the Engineers had joined the miners the loss would have been irreparable. In my experience it is the worst passive strike I have known and the most costly. Paper and other industries were not only on the verge of ruin, but the Government had a special army enlisted, as well as calling up Reserves, to meet possible exigencies.

Paper Workers Face the Music.

But fortunately all trouble is now over and the Government has voted £10,000,000 as a subvention in aid of the coal-mining industry. Once an industry begins to tamper with wages nothing but discontent may be anticipated. The British paper trade today is facing the music — at least the workers are. The mills have now posted notices intimating that the reductions will take place, but a ballot of the workers over the difference of a cent is against a reduction. Every one is waiting now to see what will the next move of the Workers' Unions. They have poor material to fight on and a poor case with very little sympathy in support of it. Indeed since the coal strike started, 3 months ago, paper mill workers and those in the allied trades handling papers have been drawing reduced wages because of the short time worked, and the unemployment was a heavy drain on the finances of the Unions and the Government. So that looking at the mill owners intentions to reduce wages in three stages of 4 cents an hour, 3 cents, and 3 cents in the third place when cost of living falls 15 points in each case, they are not asking too much and it remains to be seen now what reception the mill notices will receive.

The Outlook.

Today prices of papers are fluctuating and below the cost of production owing to foreign competition and the want of more life in the market. Mills are also on short time and many are closed, and pulp sellers find that buyers are overstocked as a consequence. There is, as a result of present conditions, no market for pulp, a lifeless market for paper at home and abroad and a feeling of uncertainty prevailing all round. That is the position now, but with the coal strike over a period of activity is anticipated. But it will take some time to get coal in circulation amongst the industries, notwithstanding the fact that some of the pits produced within the last few days 1,000 tons a day. Many markets have had stocks depleted since the strike started and with a revival in all industries those who are in a position to know fuel that a demand for paper will eventually come about. A mill owner said to me the other day that it may be two or three weeks before some of the paper mills can get going again. In all probability they would then run short time and it would not be until October before they would commence to feel their feet. At present there were not enough orders to keep the machinery running if they had plentiful supplies of coal, but if he believed buyers would have to replenish their stocks. When trade became normal. They had refrained from buying to keep prices down, then the coal strike set in upon them and with a settlement — and a reduction in prices — paper will ultimately find an outlet which will benefit mills and pulp sellers alike.

A New Mill.

Mr. Shirley W. Cropper, the chairman of the Colthrop Board and Paper Mills, Ltd., presided at the third annual meeting of the company the other day. He said that the new mill they had in course of erection, would make their plant the most modern and efficient of its kind in the country, capable, when trade revived, of competing for business on the most favorable terms and under the most efficient conditions. Their extensive buildings and the considerable plant involved were fast approaching completion, and the directors had reason to hope that everything would be in running condition well before the end of 1921.

Safe-Guarding Industries Bill.

During the past few days this Bill has been considered by the House of Commons Committees, but up to the present the efforts of the papermakers to get paper included in it has not been successful. If they should succeed it is very likely only Finland and Germany would be affected, as the competition of these countries are being felt most of all in the British market. Scandinavians, I am told, are also complaining of Finnish-German underselling, owing to the debased rate of exchange.

Obituaries.

Death has removed some familiar old figures from the paper industry and amongst them is Mr. Walter Baldwin, a well-known paper agent, of London, Mr. Joseph Castle, manager for 33 years of the Oxford University Press Paper Mill; Mr. George Crabb, who strange to say, was at one time associated with Mr. Walter Baldwin; Mr. S. H. Holman, paper agent, London, and Col. Thomas Mitchell, lately principal of Mitchells, Ashworth, Stansfield & Co., Ltd.

Notelets.

Groundwood is still selling at £5 a ton in the British market — that is if prices and as market may be said to be in existence.

Some good shipments of pulp are reaching England from Canada. Two weeks ago 22 tons of groundwood (dry) valued at £729 was landed at Manchester. Today mechanical dry pulp is £10 a ton for prompt delivery for anyone who wants it.

Congratulations to Mr. Burholt on his appointment as buyer and manager of the mills department of the Lindenmeyer and Johnson Paper Co., Ltd.

Wrapping papers are in a dull season and makers are complaining bitterly of the want of trade.

Though some of the publishers in London complain of the price of paper, which, they say, added considerably to their cost of production, they have all paid good dividends to their shareholders for the past year.

It is rumored that outside trade and financial interests are backing a project to establish a morning paper in New London, Ct.

Informants did not disclose the identity of the promoters, but intimated that outside capital of substantial amount and experienced newspaper men are interested in the proposition. Since suspension of the Telegraph, New London people have had to rely on papers from cities of a considerable distance. New London has two dailies in the evening field, the Globe and the Day. — The Fourth Estate.

The Don Valley Paper Mills, Ltd.

By A. R. R. JONES.

Located in the Don Valley about four miles from the very heart of the business district of the city of Toronto, the plant of the Don Valley Paper Mills, Ltd., can boast a situation that, for picturesqueness, is extremely hard to surpass. Indeed so picturesque and of so sylvan in character is the location that it is hard to believe that it is only such a short distance from the corner of King and Yonge Streets, Toronto's busiest point. Yet such is the case.

Although there have been three mills erected near the site of the present one under the auspices of this concern. The first mill, which was built in the year 1825, near what are now the Thorncliffe stables, was burned down. The second, erected after the first had come to its untimely end, was located near the site of the Don Valley Brick Works, which are adjacent to the present Government House of Ontario, and is now disused. The third, located about an equal distance between the second and the site of the first, is the mill that is now operated by the Don Valley Paper Mills, Ltd.

The early history of this concern is one of quite exceptional interest. It was not exactly the first to make paper in Canada. For, as a fact, the first Canadian paper mill was established in St. Andrew's, Quebec, in the year 1803—not far short of a century and a quarter ago. This was followed, fifteen years later, by the establishment in Halifax, Nova Scotia, of the second Canadian paper mill. But in Ontario—Upper Canada, as it was then called—the establishment of paper mills was not much longer delayed. In the year 1825 two paper mills were built in Ontario, and they started operations almost simultaneously in that year. One was located at a village known as Crook's Hollow. The other, situate on the Don river, about four miles from Toronto, was the ancestor, so to speak, of the mill operated by the Don Valley Paper Mills today. The Don river was described, at that time, as being a beautiful, clear stream of water, abounding in trout—a description which, perhaps, does not fit it very aptly at the present time.

Mr. J. C. Worts is president of the Don Valley Paper Mills, Ltd.; Mr. W. Davis is vice-president; Mr. H. St. J. Jarvis is secretary-treasurer; and Mr. C. Nelson Gain is superintendent. The employees number about sixty. The well-arranged plant includes four 450 lb. beating engines and one refining engine; two washers and one rotary boiler; and one eighty-four inch Harper-Fourdinier machine. The widest trimmed sheet turned out is one of seventy-two inches. Water, steam and electric powers are in use. The products of the plant comprise cover papers, post cards, posters, white and colored Bristols, sulphite and Manila envelopes. The plant's capacity is one of 20,000 lbs. every twenty-four hours.

The raw materials used consist of groundwood, sulphite, bleached and unbleached, and soda pulp. The products are marketed in Toronto, Hamilton, Winnipeg, Vancouver, Calgary, Quebec City, Montreal, St. John, N.B., and Halifax, N.S. Up till the first of this month, the plant was running full time. Now it is running about four days a week. The immediate prospects for business are not quite so bright as might be wished. This is, in a measure, owing to the present printers' strike which is exercising so detrimental an effect on all too many departments of the paper business, as a whole. However, as stocks are very low, it should not be too long before business picks up again. And, when

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The picturesque Plant of the Don Valley Paper Mills, Ltd., Toronto.

Technical Section

REVIEW OF RECENT LITERATURE.

A-3. Fiber from Seaweed. Y. HASHIMOTO, English patent 153,804. Jan. 13, 1920. Fibers suitable for papermaking and as a cotton substitute are obtained from "sugamo" (**phyllopadix scouleri,** Hook). The exterior of the seaweed is a gunlike material, which cannot be separated by mechanical means, but is removed by boiling the raw or dried seaweed with milk of lime (10 percent CaO) for half an hour to one hour, boiling with a solution of sodium bisulphite of 1° Bé. (sp. g., 1.007) for twenty to fifty minutes and rubbing away the softened crust.—C. J. W.

A-13. Testing Dyes. World's Paper Trade Review. lxxv, 8, p. 706. A description of an accurate method whereby manufacturers can test their dyestuffs without buying miniature papermaking machinery for the purpose.—A. C.

A-14. Instrument for Measuring the Finish of Paper. Paper Industry, ii. 12, 1846. Describes the glarimeter, an instrument used in measuring the gloss in paper.—A. C.

A-14. Tensile Strength Tester. World's Paper Trade Review, lxxv, 5, 468. A description of an instrument manufactured by T. J. Marshall & Company and used for testing the tensile strength of paper.—A. C.

A-15. The Testing of Sulphite Pulps. By E. G. MILHAM, **Paper Industry,** ii. 12, 1837. A description of the methods used in testing sulphite pulps.—A. C.

A-0. Treatment of Liquids Containing Sulphate of Lime. Can. patent 207,957, The A/S De Norske Saltwerker, assignee of HENRIK JANSON BULL, both of Bergen, Norway, Jan. 25, 1921. In the process of heating liquid containing compounds of calcium, the method of preventing the formation of layers containing sulphate of lime on heating surfaces in contact with the liquid, which consists in introducing into the liquid an agent capable of presipitating crystals of sulphate of lime and maintaining the crystals formed in a state of mobile suspension during the heating operation.—A.P.-C.

A-0; R-12. Application of Chemical Tests to Paper Mill Cost. E. T. A. COUGHLIN. **Paper Mill,** xliv, 11 (March 12, 1921).—Coughlin shows how the proper use of chemical tests in the paper mill will materially reduce the cost of the finished product.—C. J. W.

A-0. Chemical Standards. World's Paper Trade Review, lxxv, 5, p. 432. An article by Doctor MacDonald in which he deals with the two chief requirements of the papermaker, namely, fuel and fibrous raw material. —A. C.

A-0. Chemistry of Raw Material. Paper Maker and British Paper Trade Journal. Review of a paper on "Chemical Standards in the Commercial Valuation of Raw Materials" read at a recent meeting of the Technical Section (Aberdeen Area) of the Paper Makers' Association held at Robert Gordon's College.—A. C.

B-9. Rich Pulpwood Lands in Washington. World's Paper Trade Review, lxxv, 5, p. 438. W. W. J. Weigle, of Seattle, forest supervisor of the Snoqualmie National Forest, has issued an exhaustive report, stating that personal production of 300,000 tons annually of newsprint paper, insuring continued operation of at least six woodpulp industries is possible through the private, State and federal resources of the Puget Sound Grays Harbour Timber districts tributary to Seattle.—A. C.

D-4. Magazine Grinder. Can. patent No. 208,790, PEDER CHRISTIAN SCHAANNING, Vastre Holman, near Kristiana, Norway, Feb. 22, 1921.—A.P.-C.

D-0. Mechanical Pulp. World's Paper Trade Review, lxxv, 5, p. 452. An article on mechanical pulp manufacture, taking in some of the more important points bearing on the subject.—A. C.

E-2. Sulphite Liquor Concentration. E. C. R. MARKS. English patetnt 154,355. Sept. 5, 1919. Concentration is effected in two or more stages by repeated circulation of the liquid as a thin film over a surface heated by the evolved vapor after compression of the latter to raise it ao the necessary temperature, the solution being subjected to similar temperatures and pressures in the different stages, for the purpose of decreasing the total surface required for a given duty. The process is designed especially for liquids, the concentration of which increases the viscosity, without affecting the boiling point appreciably.—C. J. W.

E-5. Sulphite Cooking Process. Can. patent 207,956, The A/S Cellulospatenter, Kristiania, assignee of EINAR MORTERUD, Torderod near Moss, both in Norway, Jan. 25, 1921. In the process of indirect digestion of sulphite pulp, the step which comprises maintaining the digesting liquid under a pressure greater than the pressure due to the gas content at the existing temperature. In the process of indirect cooking of sulphite pulp, the method of preventing the deposition of calcium salts, which comprises filling the digester as full as practicable, and maintaining it full under all conditions of digestion, thereby maintaining a pressure in the digester greater than that due to the gas pressure at any existing temperature.—A.P.-C.

E-5; F-5. Uniformity of Digester Chip Charges. Paper Industry, ii. 12, p. 1840. Weighing experiments indicate that the digester charge is, in most instances, a reliable unit for pulp mill operation, provided the operation is uninterrupted and the soundness and species of pulpwood do not vary.—A. C.

E-5; F-5. Pressure Lock for Digesters. AKTIEBOLAGET VAPORACKUMULATOR. English patent 141,708. Apr. 12, 1920. The presure within a digester sometimes exceeds that of the steam supply, and acid is then forced from the digester into the connecting pipes. This disadvantage is overcome by the insertion of a pressure lock between the acidproof valve nearest the digester and the nonreturn valve nearest to the steam supply. The pressure lock consists of a piece of acidproof tubing arranged vertically and is connected by means of a pipe, having an open valve, to the source of pressure of steam, water or air, greater than the maximum attained in the digester. When the pressure within the digester temporarily rises above that of the steam supply, acid liquor flows through into the pressure lock and closes the nonreturn valve. The acid is thus prevented from entering the steam supply pipes and rises in the pipe connected with the

pressure lock until checked by the greater pressure therein. When the pressure within the digester becomes normal, the acid liquor is forced out of the pressure lock back to the digester, thus allowing the non-return valve to reopen.—C. J. W.

F-4. Evaporating Liquids or Solutions. Can. patent 208,203, AKTIEBOLAGET INDUNSTARE, assignee of NILE OLOF SODERLUND, both of Goteburg, Sweden, Feb. 1, 1921. The method of concentrating liquids or solutions of which the viscosity but not the boiling point substantially increases with the concentration, which consists in evaporating the solution by causing the same to flow over surfaces heated by the compressed vapor or steam given off from the solution and effecting the evaporation in a plurality of apparatus in successive stages of concentration while employing the same pressure of said vapor or steam in all of said stages.—A.P.-C.

F-5. Indirect Heating for Sulphate Cooking. Can. patent 208,134, ROLF HARALD HULT, Hyltebruk, Sweden, Feb. 1, 1921. The method of indirectly boiling liquor in the manufacture of sulphate pulp, consisting in first leading a heating agent through each of a plurality of parellelly coupled heating elements submerged in said liquid, and until the temperature has been raised to about 100° to 105° Cent. and then connecting said heating elements in series and lending a heating agent through said serially connected elements until the temperature of the liquid has been raised to 138° Cent.—A.P.-C.

F-5. Rinman Modification of Sulphate Process. BROR N. SEGERFELT. **Paper Mill,** 44, 17, and **Paper Trade Journal,** lxxii, 16 (April 14, 1921). The wood is cooked with weak caustic solution with the aid of a reducing material, preferably mercury, at a temperature not exceeding 170°. The waste liquors are concentrated, mixed with lime and distilled at about 500° Cent. This eliminates the bad odor, gives as good a yield of pulp as by the ordinary method and gives good yields of by-products; methyl alcohol 50 pounds per ton of pulp, acetone, 50 pounds, gasoline substitute, 100 pounds, heavy oils, 200 pounds.—C. J. W.

F-0. Report of the Sulphate Pulp Committee. CARL MOE. **Paper Mill** xliv, 17 (April 23, 1921), and **Paper Trade Journal,** lxxii, 16 (April 14, 1921). Discussion of Griffin's method which recommends a miniature causticizing test for evaluation of lime to be tested.—C. J. W.

H-4. Control of Chlorine Gas. L. H. GOEBEL. **Paper Mill,** xliv, 7 (Feb. 12, 1921). A general discussion of the properties of liquid chlorine, its shipment in drums and tank cars and its uses in the paper mill. —C. J. W.

H-4. Manufacture of Electrolytic Bleach. C. A. BLODGETT. **Paper Mill,** xliv, 10 (March 5, 1921). Description of the Allen-Moore cell and the installation at the Eastern Manufacturing Company.—C. J. W.

H-0. Notes on Bleach and Bleaching. FRANK D. LIBBY. **Paper Mill,** xliv, 7, (Feb. 12, 1921). General discussion of the manufacture and the methods of bleaching different kinds of paper stock.—C. J. W.

K-2. Utilization of Waste in the Paper Mill. J. S. ALLAN. **Paper Mill,** xliv, 8 (Feb. 19, 1921, also **Worlds Paper Trade Review,** lxxv, 4, p. 312. Special attention is given to the esparto mill. Allan discusses the grass washing system, substances extracted by caustic soda and the waste caustic lime; the chief waste in the breaker house is an excessive loss of fiber during washing. Broke should be classified in order to receive the proper treatment in repulping. The white water waste amounts to about 6¾ tons per week.—C. J. W.

K-4. Cooking Process for Straw. H. OEXMANN. German patents 306,325 and 309,259 (July 31, 1917 and May 25, 1918). Before treatment with strong alkalis, the raw materials are treated with solutions of weak alkalis, e.g., lime. 100 Kg. straw is boiled first with 400 to 600 liters of water and 5 to 6 Kg. of quicklime, and then with 4 Kg. of caustic soda. The product is equal to that obtained by using 9 to 10 Kg. of caustic soda only. The treatment with the weak or with the strong alkalis or both may be effected at a temperature below boiling point.—C. J. W.

K-4. Manufacture of Halfstuff. K. SCHOLZ, B. P. von EHRENTHAL, and M. von HALLE. German patent 325,918. March 21, 1917. Fibrous materials, as hemp, bagasse, tobacco stalks, jute, bamboo, etc., are treated in the usual manner employed in digesting flax by the sulphite process, except that the alkali content of the sulphite liquor is increased three or four times the usual amount and is then digested with alkali.—C. J. W.

K-7. Improved Tub Beater. World's Paper Trade Review, lxxv, 5, p. 434. A British patent has been granted to W. J. Mellersh Jackson, following a communication from the Griley-Unkle Engineering Compan yfor an invention relating to improvements in tub beaters.—A. C.

K-7. Beating Improvements by W. B. CAMPBELL. From **Pulp and Paper Magazine. World's Paper Trade Review,** lxxv, 8, p. 704. Developments which modern papermaking is forcing upon beater design and a discussion of recent researches on the subject of beating and the lines along which future research may well be pursued.—A. C.

K-7. Developments in Papermaking. World's Paper Trade Review, lxxv, 4, 298. A paper on the development of the beating engine and a discussion of the same.—A. C.

R-1. Papermaking in Peru. World's Paper Trade Review, lxxv, 4, 304. The translation of a bill under discussion in the Peruvian chamber of deputies, having for its object the cheapening of paper in Peru. In one of the articles it is proposed to take the import duty of papermaking machinery and materials.—A.C.

K-7. Treatment of Vegetable Fibers. GILLET ET FILS. English patent 150,665. Dec. 12, 1919. Vegetable fibers are made to resemble wool both in physical properties, such as feel and appearance, and in chemical qualities, such as behaviour toward dyes, by impregnating them with the products of hydrolysis of certain proteins, such as casein, albumin and gelatin, by mineral acids. Hydrolysis of the protein may be effected either before treatment of the fiber or on the fiber; in either case the fiber is afterwards washed with water, dilute acid, dilute alkali, or a solution of a salt, such as sodium bisulphate, ammonium sulphate, or sodium phosphate, and may be subsequently treated with formaldehyde or other protein precipitant.—C. J. W.

K-10. Sizing Process for Paper. R. JENNISON and J. P. de Chanaz. English patent 154,366. Sept. 9, 1919. Woodpulp or similar cellulosic material is treated with 20 percent of starch and 1 to 5 percent of caustic soda and beaten for thirty minutes to eight hours. The caustic soda is neutralized by the addition

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PULP AND PAPER NEWS

Operations have recently been resumed at the plant of the Mattagami Pul pand Paper Co. at Smooth Rock Falls, Ont. There are not many signs as yet of improvement in the market for sulphite pulp, but officials of the Company are of opinion that the present depression will not last much longer, and a supply is being accumulated in readiness for the much-to-be-desired revival of business. The plant is not at present working to capacity, but still the operations are of a substantial kind.

Last week, the commission, composed of representatives of the pulp and paper manufacturing companies and the trade unions of the industry, which is investigating conditions in the industry, with a view to settling matters which led to strikes this spring and summer, passed through Toronto from Iroquois Falls to Three Rivers, Que. The commission comprises three representatives of the employing companies, Messrs. Burke and Carey, presidents of the larger unions of the industry, and Mr. John Foster, of the Montreal Trades Council. It was accompanied by some members of the New York State Legislature, and, after the termination of its visit to Three Rivers, it will spend some time in a survey of conditions in New York State.

No settlement of the printers' strike in Toronto, which has been in progress since June 1, is in sight. Thus far, the strike has cost the Typographical Union something like $130,000. The married strikers are being paid $25 a week, and the unmarried $20 a week, by the Union. The local Union's disbursements are at the rate of $16,000 a week.

The delegates to the convention of the International Stereotype and Electrotypers' Union, held in Toronto last week, voted to submit to the membership in Canada and the United States a proposition to make a special assessment of two per cent. of the weekly earnings of each member towards financing the forty-four hour week campaign. According to a statement of an official, a number of stereotypers are on strike in the United States for the forty-four hour week and the Canadian Unions will make a demand for the forty-four hour week on the termination of their present agreements. Two stereotypers' locals in Ottawa are at present on strike.

The strike of the book-binders employed in the different job printing offices in Ottawa ended, last week, in the capitulation of the strikers. As was the experience of the bookbinders in Toronto, however, many of them have been unable to get back their old jobs, in consequence of their places having been filled, and are now out of work. Those who have been fortunate enough to get back their old positions have gone back on the forty-eight hour week basis at $35 a week.

At the Conservative picnic, organized annually by Mr. T. Herbert Lennox, M.P. for North York, and held at Jackson's Point, near Toronto, last week, Mr. G. Howard Ferguson, the Provincial Conservative leader made a vigorous attack on Premier Drury, in connection with the famous Backus deal. He condemned the Premier's action in the matter in almost unmeasured terms and declared the whole transaction was one of the most improvident in the history of the Province of Ontario. He asserted that E. W. Backus had got a large tract of the public domain at his own figure—"a vast empire of forest wealth for which he is to pay the people about a third of a cent per cord at a time when pulpwood was selling as high as $6.00 per cord." Mr. Ferguson decided the idea that the transaction could be called a public sale, and asserted that, which it was true that there were three other alleged bids, "the Prime Minister knows that two of the bids came from Backus' own partners and the third from his paper broker."

Mr. Charles V. Syrett, manager of the Victoria Paper and Twine Company, and president of the Canadian Vegetable Parchment Company, Ltd., addressed the Kiwanis Club of Toronto, last week, on the growth of the paper industry. After sketching the history and growth of the industry from its inception in Canada, he stated that at present the industry has a very keen eye on export markets, particularly in the sister Dominions. "We should", said Mr. Syrett, "strive, above all things, to do as much business, along reciprocal lines, within the British Empire as we possibly can, with merit, honor and service" as our watchwords.

It is, in the highest degree, satisfactory to learn that the export business of the Wayagamack Pulp & Paper Company, Ltd., is evincing very gratifying signs of revival. During the last few weeks, orders for paper have been received from Great Britain, South Africa and Japan. As kraft paper is in such great use by merchandizing concerns in general, these orders, following reports that business conditions in Great Britain and elsewhere are gradually improving, may be taken as an encouraging sign of commercial revival.

The Ontario Government Forestry Branch is inserting in the newspapers a very effective series of advertising articles designed to enlist the co-operation of citizens generally in a Province-wide campaign to prevent forest fires. The key-note of each article is "Save Ontario's forests—they're yours!"

At their international convention in Toronto, Stereotypers and Electrotypers refused to support a proposal that their Union enter into an arbitration agreement with Newspaper Publishers' Association. The committee which dealt with the proposal reported against it, and the committee's report was supported when it was presented to the convention.

The organizer of the Toronto Bookbinders' Union made an appeal to the Toronto Trades and Labor Council for financial assistance for that Union which, he stated, was in serious difficulties and many of its members suffering distress. He pointed out—what has been before stated in this column—that, while some member had returned to work, many are still out of employment. This request brought forth very pointed objections from some of the delegates. One of them stated that the stonecutters, who had been out on strike for many weeks against the "open shop" principle, had received no financial assistance. Another observed that "the bookbinders went out on strike with the printers. We are told that the printers possess an immense strike fund, which is growing in spite of the strike. If an organization whose interests are identical cannot help them, how can we?" The chairman pointed out that the Council had no funds for the purpose.

The Toronto District Trades and Labor Council decided, at a meeting last week, to ask the Trades and Labor Congress officials to appear before the Minister of Justice to demand an investigation of the alleged boycott threatened by the Toronto Typothetae against employers who sent their work to shops conceding the forty-four hour week.

Business doing by the Laurentide Company is stated to be very satisfactory, especially when considered with regard to business conditions generally. The Company has been happy in enjoying immunity from strike troubles.

Mr. Edward Beck, in charge of publicity for the Canadian Pulp and Paper Association, who has been in Europe for a couple of months, investigating the industry situation in Scandinavia, will sail for Canada by the Empress of France, on the 4th of next month, with his son, Mr. Frederick Beck, who has accompanied him on his trip.

It is expected that a daily paper will shortly be published in North Bay, Ont. The Town Council of North Bay has agreed to rent the toy factory, a building owned by the municipality, to the Daily Nugget, of Cobalt, for three years from the 1st of next month, and it is thought that the paper will be operating in a month from that date. The Daily Nugget has been published as a daily for some twelve years.

Mr. William, alias Billy, Whyte, has sent us a card from Japan and extends his greetings to the trade through the Pulp and Paper Magazine.

Mr. T. H. Nevill, for several years general superintendent of the Trorold and Tonawanda plants of the Beaver Co. is now Superintendent of the Board Mill of the Brompton Pulp and Paper Co. at East Angus. He takes the place of Mr. L. N. Austin, who resigned recently. Another new-comer in East Angus is Mr. William Slocom from Grand Falls, Newfoundland. His position is boss machine tender.

Meetings are being held this week in Montreal, looking to a solution of the financial problems of the Riordon Company. It is too early to make any statements.

The Laurentide Nursing Home was officially opened on July 15. Provision is made for the development of a fully equipped 100 bed hospital.

Mr. H. Biermans, general manager of the Belgian Industrial Co., has returned from a business trip abroad.

Frank Stoughton has been promoted to Tour Boss at the Abitibi mill. He takes the place of George Duers, who has been transferred to the new machine room which contains the biggest paper machines in the world — 232" wide.

Although the Brompton Pulp and Paper Co. has more than earned the common dividend heretofore distributed, the directors have decided to retain this additional cash resource under present conditions.

The publication of the St. John, N. B., *Standard* has been temporarily suspended, pending a reorganization.

Mr. Frank Symonds, representing W. J. Gage and Co., Toronto, visited Windsor, N. S., last week.

In keeping with the trend of the times and the force of conditions, the Laurentide Company has finally decided to reduce wages generally about 10 per cent. The order went into effect on July 14.

The Panuke Pulp and Paper Company, Windsor, N. S., has called a meeting to consider the authorization to issue the first mortgage bonds, not to exceed $50,000.

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it does, the good reputation which the Don Valley Paper Mills, Ltd., has justly earned for quality and efficiency of workmanship cannot fail to stand it in good stead.

The ground belonging to the concern covers about seven acres. Its shipping facilities are excellent, as it has its own siding to the Canadian National Railways, and employs motor trucks for city deliveries. The sales office is at room 714 Dominion Bank Building, Toronto. It should be added that although the concern belongs to the same estate as the Don Valley Brick Works—namely, the Robert Davis estate—the two companies are quite separate and distinct.

OTTAWA NOTES.

A largely signed petition protesting against the yards of Export Lumber Company on Preston street is no wbeing considered by the Board of Control. The petition claims that the owners are not observing the regulations which prohibit lumber from being piled within one hundred feet of a building. It is also claimed that the piles constitute a fire menace and increases the fire insurance rates.

Hon. Erskine Henry Bronson, pulp manufacturer of Ottawa, who died October 19th. 1920 left an estate of over one million dollars. This is shown by his will which has been filed at the court house, Ottawa, for probate.

A damage action taken in the Superior Court of Quebec by Mr. Arthur Lerke against J. R. Booth, Company, Limited, has been settled out of court on the basis of Mr. Lerke receiving $1,500 in settlement of his $3,000 claim. Lerke was injured while felling a tree in the Kipawa district in January last.

Sir George Foster, Minister of Trade and Commerce, has forecasted at Ottawa that the Canadian Government would shortly confer with the commission to be appointed by the United States in regard to the prohibiting of the export of pulpwood from Crown lands. Just what attitude the Canadian Government will take has not yet been announced, as Sir George said that no definite line of action would be taken till the U. S. Commission was finally appointed.

TO BUILD PAPER MILL AT PRINCE RUPERT.

The newly-formed Prince Rupert Pulp & Paper Co., Limited have taken over the Emerson saw mill at Prince Rupert, B.C., and its timber limits in that district, covering approximately 2,000,000,000 feet of timber and several water powers as well. The saw mill is located on Prince Rupert Harbour and has a cutting capacity of 40,000,000 feet per year. The plans of the Prince Rupert Pulp & Paper Co. call for the installation of a paper mill with a capacity of 200 tons a day, which will be located alongside the existing saw mill. The first unit being installed is a 40-ton sulphite mill and the construction of the plant is under the direction of the Management Engineering & Developing Co. at Dayton, Ohio. It is expected that the first unit will be completed early next year. The operations of the saw mill have hitherto been confined entirely to spruce but on completion of the sulphite plant, the saw mill will market only the upper grade of clean spruce, the lower grades all being used in the production of sulphite pulp. John Emerson is president of the company and J. A. Ward Bell is general manager. T. H. Watson, of Toronto, is associated with the company.

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of alum or other aluminum salt, the pulp is diluted with water, passed through a papermaking machine, and the paper dried. For transparent greaseproof paper, the paper web is incompletely dried, and then friction-calendered until transparent. If more than 20 percent of starch be used, the strength and the transparency of the paper are increased.—C. J. W.

K-10. Treating Asphalt for Sizing Paper.—Chem.-Analyt. Lab. SCHICK and HORAK. German patent 325,780. July 7, 1118. The melting point of asphalt is lowered by the addition of a terpene or an aliphatic or aromatic alcohol. For the impregnation of yarn, fabric, paper, cardboard, etc., asphalts containing 0.1 to 1 per cent of fusel oil are suitable.—C. J. W.

K-12. Apparatus for Drying Sheets of Paper. O. MINTON. English patent 154,120. March 26, 1920. Paper is dried by passing it without tension through a liquid seal into a vacuum chamber, over numerous rollers, some of which are immersed in a heated neutral fluid, and out through the same or a different liquid seal. Mercury may be used for the sealing liquid and for the heated neutral fluid. Paper having "cockled" effects may also be produced by this method and the drying temperature may be low or high.—C. J. W.

K-12. Press Rolls. AKTIEBOLAGET KARLSTADS MEKANISKA VERSTAD. English patent 149,970. Aug. 9, 1920.—C. J. W.

K-12. Cylinders for Drying Food, Paper, etc. J. MCINTYRE and J. MILNE & SON, Ltd. English patent 154,508, April 12, 1920. The ends or plates covering the ends of the cylinders are coated with glass or with vitreous stove enamel, in order to facilitate cleaning.—C. J. W.

K-12. Briner Economizer for Ventilation of Machine Room. W. H. HOWELL, Jr. **Paper Mill,** xliv, 17 (Apr. 23, 1921), and **Paper Trade Journal,** lxxii, 16 (April 14, 1921).—C. J. W.

K-12. Speed Interlock as Applied to the Paper Machine. F. G. WARBURTON. **Paper Mill,** xliv, 6 (Feb. 5, 1921). Discussion of sectional motor drives of paper machines, especially as installed with the new Laurentide machines.—C. J. W.

K-12. Drying Paper, Temperature Control and Heat Conservation. F. C. FARNSWORTH. **Paper Mill,** xliv, 9 (Feb. 26, 1921). Description of the Farnsworth forced steam circulation system.—C. J. W.

K-12; Q-0. How to Eliminate Condensation in the Paper Mill. By H. F. SMITH. **Paper Industry,** ii. 12. The several factors to be considered in the prevention of condensation, as well as the savings resulting from the use of a gypsum roof deck on a typical mill.—A. C.

K-14. Sheet Feeding Machine. Can. patent 207,757, The Dexter Folder Co., assignee of CARL E. CHRISTOPHEL, both of Peary River, N.Y., U.S.A., Jan. 18, 1921.—A.P.-C.

K-15. Coating Process for Hygroscopic Material. M. AROSIO. English patent 131,911. Sept. 28, 1919. In providing hygroscopic material, such as wood, vulcanized fiber or paper, with an adherent impermeable coating of a substance such as celluloid or cellulose acetate, the material is first dried thoroughly and then saturated with the solvent subsequently to be used for the coating substance. It is then steeped for a short time in a weak solution of the coating substance, containing also a suitable proportion of mineral coloring matter, withdrawn, and allowed to dry.—C. J. W.

K-21. Roofing Paper Mopping Machine. Can. patent 208,052, STEVEN TROY and LEW JACOBSEN, Feb. 1, 1921. A roofing paper mopping machine of the class described, comprising the combination with a suitable frame, of a tank adapted to hold a fluid waterproofing material, a mopping roller rotatably mounted above the tank to dip the lower part of it into the waterproofing material, a drive roller rotatably mounted parallel to and immediately above the mopping roller, said drive roller being of less width than the paper to be mopped, means for driving the mopping roller from the drive roller, means limiting movement of the drive roller towards the mopping roller short of contact therewith, and means for mounting a roll of paper adjacent the drive on the machine that the paper may be delivered over and under the drive rollers.—A.P.-C.

K-23. Drying Apparatus for Varnished Paper. J. W. WILSON. English patent 154,746. Oct. 15, 1919.—C. J. W.

K-23. Waterproof and Felted Sheets. World's Paper Trade Review, lxxv, 5, p. 430. Some suggestions from an invention by Lester Kirschbraun for improvements in the manufacture of waterproof and felted sheets.—A. C.

K-23. Photographic Paper.—World's Paper Trade Review, lxxv, 8, p. 690. An article describing the process and care of its manufacture.—A. C.

K-0. Perishing of Paper in Indian Libraries. Paper Maker and British Paper Trade Journal, lxi, 3, p. 376. Paper in Indian libraries, especially in plain stations such as Calcutta, Madras, and Bombay, will not withstand the climate, perishes easily and must be prepared in a special way to be preserved.—A. C.

L-4. Paper Cup Forming Machine. Can. patent 207,740, The Vortex Mfg. Co., Chicago, Ill., assignee of GESARE BARBIERI, Washington, D.C., both in U.S.A., Jan. 18, 1921.—A.P.-C.

L-5. Saccharification of Cellulose. A WOHL and H. KRULL. **Celluloschemie** ii, 1-7 (1921). In laboratory experiments cotton yielded 97 per cent. of the theoretical amount of reducing sugar by a preliminary liquefaction (primary hydrolysis) with fuming hydrochloric acid, followed by a second hydrolysis by boiling with dilute acid. Results obtained with a variety of products indicate that the method might be employed for the determination of cellulose.—C. J. W.

L-0. Method of Heating Printed Sheets. Can. patent 207,821, JAMES E. DOYLE, Cleveland, Ohio, U.S.A., Jan. 25, 1921. Means for preventing offset in printing upon sheets carried upon a printing press comprising a plurality of incandescent heating units exposed above and arranged below, so as to extend across the path of movement of said sheets, and means whereby the functioning of said units may be separately controlled.—A.P.-C.

L-0. Food Product from Wood. Can. patent 208,581, The Burgess Laboratories, assignee of HOWARD F. WEISS, both of Madison, Wis. U.S.A., Feb. 15, 1921. A stock food comprising the composite sugar of hydrolysis of Western larch wood, including galactose in a concentrated state and in admixture with finely divided hydrolyzed larch wood residue.—A.P.-C.

M-4. The Proper Handling of Belts. Paper Industry, ii. 12, p. 1855. Comment on an article published in the December issue of the **Paper Industry,** entitled Stopping Belt Slip with Cutting Edges.—A. C.

M-6. Application of Electricity to the Paper Mill, by E. E. FULLER, A.M.I.E.E. **World's Paper Trade Review,** lxxv, 9, p. 774. The various sections of the papermaking plant with information regarding the power

required to drive them with curves which show the variations in load.—A. C.

M-0. Power Plant Management. By ROBERT JUNE. **Paper Industry,** ii. 12, 1850. The fourth article on ash and coal handling equipment.—A. C.

M-0. Mechanical Standards. Paper Industry, ii. 12, p. 1856. A report of committee on Mechanical Standards of the Technical Section, Canadian Pulp and Paper Association.—A. C.

N-6. Steam Economy in Paper Mills. R. W. LEEPER. **Paper Mill,** xliv, 17 (Apr. 23, 1921), and **Paper Trade Journal,** lxxii, 16 (April 14, 1921).—C. J. W.

P-1. Engine Guarding and Engine Stops. Paper Industry, ii. 12, p. 1841. An article on safety conditions in the engine room, prepared by the engineering section of the National Safety Council.—A. C.

Q-2. Plant Layout. Engineering News Record, lxxxvi, 12, p. 505. The report submitted at the annual convention of the Concrete Institute embodies description of and comparative costs upon seven fundamental types of concrete plants.—A. C.

Q-4. Reenforced Concrete in Paper Mills. World's Paper Trade Review, lxxv, 5, 466. A discussion of the important development of reenforced concrete for use in paper mills.—A. C.

R-1. Pulp Manufacture in Australia. World's Paper Trade Review, lxxv, 5, p. 405. An interesting development of the Queensland Pine's Company's woodpulp plant at Yarraman is proposed.—A. C.

R-2. Two Related Industries. Paper Maker and British Paper Trade Journal, lxi, 3, p. 373. A book issued by F. C. Huyck and Sons, of Albany, N.Y. The story of felts from the beginnning of their manufacture and how dependent is the great industry of papermaking on the product, papermakers' felt. —A. C.

R-4. Woodpulp Contracts. World's Paper Trade Review, lxxv, 4, p. 366. The view of a mill manager on how British papermakers are handicapped.—A. C.

R-5. German Newsprint. World's Paper Trade Review, lxxv, 4, p. 310. Observations of W. F. Ehrnholm, of the New York Overseas Company during his tour of England, Scandinavia and Germany, on the conditions of manufacture and export.—A. C.

R-5. German Paper. World's Paper Trade Review, lxxv, 5. German newsprint in enormous quantities is going to Spain, Italy, Central Europe, South America and elsewhere at prices with which British manufacture cannot compete and is proving a great menace to the industry in England.—A. C.

R-7. Finding the Employee, by PHILIP C. PACK. **Paper Industry,** ii. 12, 1875. It is saving for an organization to have a system installed which allows each man constant communication with every other man.—A. C.

R-9. Tariff Hearing. Paper Mill, xliv, 7 (Feb. 12, 1921). Arguments of manufacturers for duty on all grades of paper.—C. J. W.

R-9. Belgian Newsprint Free. World's Paper Trade Review, lxxv, 4, p. 358. By a decree issued by the Belgian Minister of Economic Affairs, dated December 15, 1920, newsprint paper is exempted from the requirements of an export license.—A. C.

R-11. Paper Laboratory of Bureau of Chemistry. Paper, xxvii, 18 (Jan. 5, 1921). A report of the Bureau of Chemistry on the paper work done in its paper laboratory mentions that specifications for blue—and brown-print papers for various government departments were drawn up, and specifications for the preparation of water-resistant papers for baling have been published. Work is being done on the testing of paper products, fiber-board, and water-resistant wrapping papers. Factory scale experiments have been made on the use of the adhesives from corn cobs, the production of which was described in 1919. Investigations of the suitability of different types of containers for the storage of baking powders and of dehydrated vegetables and fruits have been completed and prepared for publication.—A. P.-C.

R-12. Box Board Costs, by E. G. CLARKE, **Paper Industry,** ii. 12. The organization and fundamental points necessary to a perfect cost system.—A. C.

R-12. Box Board Costs. E. C. CLERKE. **Paper Mill,** xliv, 7 (Feb. 12, 1921). Application of a cost system to the Richardson Company, Lockland, Ohio.—C. J. W.

R-12. Cost Accounting Fundamentals. B. E. HUTCHINSON. **Paper Mill,** xliv, 6 (Feb. 5, 1921). Its application to the paper industry.—C. J. W.

R-12. Argument for Mill Cost System. Paper Mill, xliv, 7 (Feb. 12, 1921). There are two broad reasons: To ascertain the true manufacturing costs to serve as a basis for fixing the selling price; to eliminate waste by finding where it occurs.—C. J. W..

R-12. Why We Have a Cost System. S. B. COPELAND. **Paper Mill,** xliv, 16, 294 (April 16, 1921).—C. J. W.

R-12. Costs in the Paper Mill. JAMES A. REILLY. **Paper,** xxvii, 14 (Dec. 8, 1920). "The cost system is a methodical analysis and determination of the total outlay involved in material, labor, overhead and all other items included in the process of manufacturing and selling any article." Manufacturing costs should include direct labor, actual material consumed, direct mill overhead (expense not directly chargeable to operation as direct labor or material but as direct cost of operating auxiliary departments such as steam, power, building, expense, general plant, etc.), and indirect mill overhead (depreciation, insurance, all taxes except government and state taxes that are based on income, general administrative expenses, research department, purchasing department, cost department, engineering department, etc.). Interest on investment and additional reserve may or may not be added. Packing and shipping costs may be classed either as part of manufacturing costs, or charged against gross profits. Various uses for manufacturing costs are enumerated, and the method of using them for estimating costs and arriving at net selling price is explained.—A. P.-C.

R-0. Relation of Paper Manufacture to Other Industries. JAMES STRACHAN. **Paper,** xxvii, 18 (Jan. 5, 1921). Review of the relation between the papermaking and other industries, and more particularly the textile industry from which papermaking originated. Papermaking borrowed its first raw materials and several of its processes (cooking, bleaching, loading) from the textile industry; but it is now furnishing it with an ever increasing amount of raw material in the form of artificial silks. The ever increasing expansion of the pulp and paper industries has resulted in great advances from the technical and scientific points of view, and now many products which were useless, and even troublesome, are put to good use. It has also contributed to develop considerably some of the subsidiary industries, such as the manufacture of china clay, alum, metallic wires, and felts.—A. P.-C.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 23rd July.—In conversation this week with a man who is as conversant with the conditions of the Canadian paper trade generally as anyone in the Dominion, the writer was told that, while certain lines exhibit some activity — an activity which, however, is usually spasmodic—the prevailing tone of the market continues on the whole, as it has been for some time, abnormally dull. The authority in question, however, seemed fairly confident that the autumn season would bring with it some improvement in the situation. As has been frequently pointed out, the prevailing depression in the trade has, as regards many lines of it, been accentuated by the strike compositors in Toronto. But, at the same time, it is an incontrovertible fact that, if the strike had to come at all, it could not have come at a moment more opportune for the employing printers than that which was chosen. Had things been humming, the employers would possibly have found an insuperable difficulty in getting out the absolutely necessary work. As it is, with advertising on a diminished scale, and with things generally just dragging along rather than going at full blast, they have been able to make a surprisingly good showing with the work that would not admit of postponement. The strike itself drags on its weary and monotonous way. There looks as little prospect as ever of its ending in any agreement or compromise. And each side is as confident as ever of its ability to last out the other. Among its many ill effects, one certainly has been, and is, that some of the work got out by some printing houses has been less efficient than formerly. However, as such work emanates, usually, from firms which, or individuals who, are themselves employers, and as the great majority of Toronto employers are (as it seems is beyond question) opposed to a forty-four hour week, and consequently behind the employing printers in their stand against it, large allowances are made for what are regarded as unavoidable lapses from the standard of efficiency and punctuality usually demanded.

The informant previously quoted intimated that the reason—or one of the main reasons—for the present general dullness in the paper trade was not far to seek. "Take the case of Toronto," he said: "Quite a considerable number of industrial plants are closed altogether. More still are working three and four days a week. The same kind of conditions prevail, more or less, in the vast majority of the cities and towns in Ontario, and, indeed, throughout the Dominion. In commercial and financial establishments, too, such as make use of writing papers, ledgers and so forth, business is, speaking generally, sluggish in the extreme. Hence, consumers, as a body, are holding off from buying, not out of 'pure cussedness,' but because they are, most of them, themselves passing through a period of exceptional slackness. This state of affairs limits the demand for paper in the present, while the very general uncertainty as to what may be called a permanent revival of business, although there is a distinct feeling that some betterment of conditions is bound to come with the early fall, is impelling the consumer to restrict his buying to little beyond his present requirements."

PULPWOOD.—There is practically no change in the pulpwood situation. Most of the mills have large stocks on hand, while the market continues for the most part, to exhibit little activity.

PULP.—Up to the present, the trade in pulp has not shown many signs of increased briskness. But there is a feeling that the period of extreme depression has now passed, and that, from now on, business will gradually revive. It is regarded as a hopeful sign of the times that the Mattagami Pulp and Paper Company has resumed operations, on a considerable scale, at its plant at Smooth Rock Falls, Ont.

NEWSPRINT.—The trade in newsprint is, on the whole, and taking the various adverse circumstances into consideration, fair. Indeed, some of the mills report the business they are doing as "satisfactory". Those in control of newspapers, however, express a very confident view that prices will, before very long, undergo a further reduction.

GROUNDWOOD. — An increasing demand for groundwood is expected in view of the comparatively satisfactory trade in newsprint. When this demand occurs it is quite on the cards that the prices will rise.

WRAPPING PAPERS. — The general situation in wrapping papers continues rather dull, with an improvement expected very shortly. The kraft aspect of that situation is better than the others, and this may be partly due to the reductions in prices noted last week, although to what extent is not clear, seeing that other wrapping papers have also undergone a reduction in price. Orders for kraft for export are also on the increase.

TOILETS AND TISSUES.—The business in toilets and tissues continues fair and the demand for these lines is relatively steady.

NEW YORK MARKETS.

New York, July 23. — (Special Correspondence)—The paper market has been quiet this week. Trade has been principally of retail scope, buyers in common have confined their orders to small quantities of paper needed for immediate purposes, and the situation is showing clearly the effects of the usual mid-summer slowing up of business. Some members of the trade who evidently are paying more attention to the seasonal dullness than others have become a bit pessimistic over conditions, and openly assert that business is at present quieter than at anytime since the period of depression set in a little over a year ago. This may be true to an extent, but there are many who are optimistically looking forward to marked improvement in the fall and who express the opinion that the paper industry is today in a healthier state than it has been in many months. These latter point out that prices on most kinds of paper have been readjusted to where they compare very favorably with those existing prior to the war, that wages of paper mill workers have been reduced to levels more in keeping with prevailing circumstances, and that raw materials of practically every description are down in price where in most instances



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there is scant probability of any further recession taking place. This means that fundamental factors governing the industry are sound, and the only thing the market awaits to become livelier is the growth of demand from consuming quarters. Unfortunately, conditions in the consuming lines and the general financial situation still make for cautious buying, while the mid-summer season also is keeping a good many users of paper out of the market as purchasers, but it stands to reason that this condition cannot last indefinitely, and a majority in the trade are of the belief that the market will commence to revive in activity early in the fall and gradually improve until before the end of the year the situation will have reverted to close to normal.

There has been a further slight decline in prices on wrapping paper. No. 1 domestic kraft is quoted down to 6 cents a pound, although most of the large producers are asking a half cent better than this figure. The drop in kraft wrappings doubtless is mainly due to the sharp recession in prices on raw material, kraft pulp having declined to a point where No. 1 pulp is reported available at 2.75 cents per pound and less. Jute manila wrapping papers hold steady at 8 to 8.50 cents on No. 1 and 6.50 to 7 cents on No. 2, and No. 1 fibre papers are unchanged at 6 to 6.50 cents.

No change of note is reported in the newsprint market. With the strike over and most mills again operating, there are larger supplies available, and offerings of side runs and sheet news have been heard of at concessions, but prices on news in standard rolls hold steady at around 4.75 cents a pound at mills, this being the price quoted generally to both contract and transient buyers. Consumption of print paper is at a low point at present—it invariably is at this season—but there has been no decrease out of the ordinary for the middle of the summer.

Book papers are in a quiet market position. Contract business comprises the bulk of present activity as publishers are seldom coming into the market for extra supplies excepting of very small volume. No alteration has occurred in quotations. Machine finished book is quoted by domestic mills at 6.50 to 7 cents per pound f.o.b. mill and super book at around 8 cents, while coated book is priced at an average of 10.50 cents.

Tissue continue fairly active. There is a ready demand for towels and napkins and toilet tissue, and fine grades of tissue are moving in relatively good amounts, with the quotation on No. 1 white maintained at between 90 cents and $1 per ream. Fine papers are quiet, jobbers showing little desire to stock. Obviously, the slowing up of general business has affected fine papers to a greater degree than some other grades, because there is less correspondence and therefore less bond and ledger paper consumed. As one paper dealer put it, "Ask the letter carrier; he will tell you how the mail has shrunk."

Boards are wanted chiefly in small lots and there is no especial activity in the trade and no feature other than that box manufacturers are looking ahead and are placing a fair volume of orders for delivery commencing about the middle of August. This promises better times for the board manufacturer and dealer. Prices at present are easy and plain chip board is freely available in the East at $28 per ton at the mill and news board at around $32.50.

GROUND WOOD.—There is a firm tone to quotations on mechanical wood pulp and the tendency is decidedly upward. This is due not to any large demand at the moment but more to expectations of traders that a shortage of water in August and September will interfere with grinding operations and cause a material decrease in production. There have been sales of prime spruce ground wood in Upper New York State this week at $28 per ton at the pulp mill, and while some manufacturers are quoting f.o.b. prices slightly below this level, it is said that no ground wood is to be had at less than $36 a ton delivered at consuming points. Moreover offerings are far fewer in number and of lighter quantities than in some time, indicating that sellers are holding on to pulp.

CHEMICAL PULP.—The chemical pulp market is very easy. There is little or no demand of consequence, and prices are dropping with marked rapidity. Pressure from sellers in Scandinavian countries, coupled with the reluctance of paper mills to absorb pulp, is making for a weak condition, and so many and varied quotations are mentioned that it is questionable just how low prices have fallen. It is known, however, that domestic producers are offering bleached sulphite down to 4 cents a pound or $80 per ton, and it is reported that even some imported bleached sulphite of good quality is available at the same low figure. Offerings have been reported of prime unbleached sulphite of domestic origin down to $60 a ton, and news grade sulphite is reported selling at $55. Kraft has eased off further to 2.75 cents a pound at mills, with reports heard of sales in out of the way cases at even lower levels. In fact, it is known that a New York importer of Finnish kraft pulp is offering spot stock at $49 a ton ex the dock.

RAGS.—The papermaking rag market is almost entirely devoid of life. It cannot be said that dealers are falling over themselves in an effort to market stocks, but there are some who are accepting almost any prices offered to rid their warehouses of rags. Under such circumstances it is very difficult to learn what really constitute market values. There have been reports of

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sales of repacked thirds and blues of city origin to paper mills at 1.50 cents at shipping points, and definite offerings by dealers of No. 1 repacked old whites at 4.75 cents and of No. 2 repacked whites at 2.60 cents have been noted. Roofing is selling at 80 cents a hundred pounds at shipping points for No. 1 packing and 70 cents and less for No. 2 packing. New cuttings are nominal in price; there being so few sales that no established market basis exists.

PAPER STOCK.—Some grades of old paper are in moderate demand but the current movement of them is such as to have little sustaining influence on prices and the tendency of values is mostly downward. Aggregate business is indeed slight. Some consuming mills which for a time recently purchased fair-sized quantities of old paper presumably have switched their buying to wood pulp, and demand from even these sources has fallen off. Quotations in the New York market on the principal grades range about as follows, on a f.o.b. New York basis: No. 1 soft white shavings, 2.20 to 2.40 cents; No. 1 hard white shavings, 2.70 to 2.85 cent;s heavy book stock, 85 to 90 cents; ledger stock, 1.40 to 1.60 cents; No. 1 old kraft, 1.60 to 1.75 cents; white blank news, 1.45 to 1.60 cents; No. 1 mixed paper, 25 to 30 cents, and folded newspapers, 35 to 40 cents.

OLD ROPE AND BAGGING.—Old bagging is still dropping in price and there have been reports of offerings of No. 1 scrap bagging at 75 cents per hundred pounds and of No. 1 domestic gunny bagging at one cent a pound at shipping points. Mills display little buying interest, and very few sales are going through. Old rope continues in moderately good demand and is bringing around 4 cents a pound New York for manila rope in No. 1 condition.

A NEW BOOK ON BELT CONVEYORS.

A new book on Belt Conveyors has just been published by the Link-Belt Company of Chicago, Philadelphia and Indianapolis. It is book No. 215. It fully describes the Uniroll and Multiroll Idlers recommended by this Company.

Among the interesting features of the book are:—

1. The correct methods of figurng Belt Conveyors and the details entering into them.

2. Price list which will enable the user to determine the cost of a complete conveyor or any portion of a conveyor.

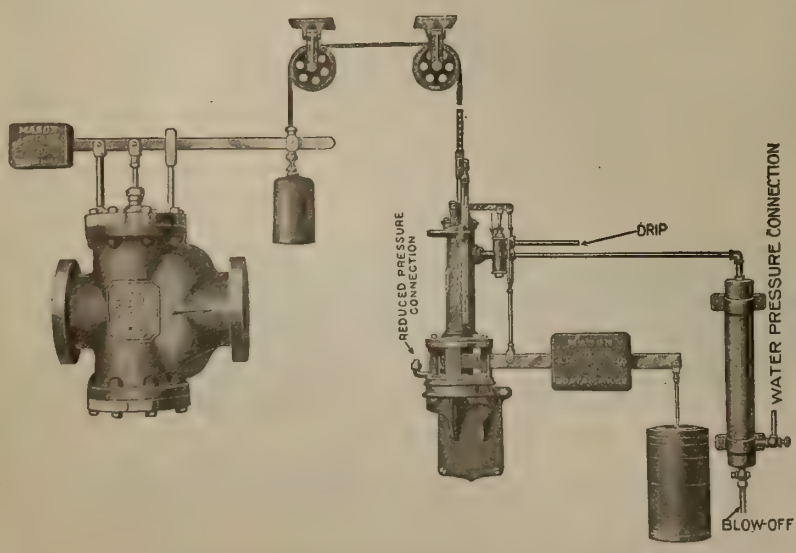
3. Numerous examples suggesting the correct types of Belt Conveyors for the handling of Bituminous Coal, By-Product Coke, Sand and Gravel, Bagged Sugar or similar material, Crushed Rock, etc.

4. In addition there are many illustrations of typical installations.

This book should be a valuable addition to any library, and will be sent by the Link-Belt Company to anyone interested in this subject.

The Nashville Pulp and Paper Mills, headed by Robert J. Cullen, is to be started soon, according to the Nashville Banner. The initial operation will produce 75 tons per day of kraft pulp, employing the sulphate process. The mill property contracted for involves a large part of land and five of the enormous buildings formerly used in cotton purification and drying processes. There will be constructed, in addition, a large boiler plant, liquor recovery plant, causticizing units, wood preparation rooms and a number of storehouses. This will involve expenditures ranging around or perhaps beyond the impressive figure of $500,000.

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OF CANADA

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VOL. XVIX. GARDENVALE, P. Que., August 4th, 1921. No. 31

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

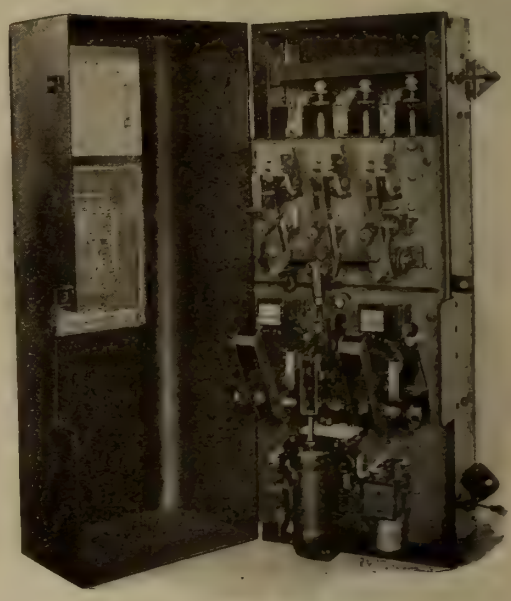
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EDITORIAL

DISARMAMENT.

No nation could have received with greater appreciation of its full meaning than Canada, the invitation of President Harding for the disarmament conference. Canada and the United States have lived in happy and peaceful accord for well over a century and this means that there has not been a hostile shot fired by one English speaking people upon another in more than hundred years. There is one side of this question which affects Canada in quite a different way from the mother country and from the other nations invited to the conference; that is, the relative benefit to the tax payer in those different lands. Canada has not been burdened with the support of a military or naval program at all proportionate to similar expenses in other countries. It is true that we have a very heavy burden as a result of the late war but a world movement for disarmament would not at all relieve our obligations with respect to past expenses and losses. The very considerable relief however, that disarmament would bring to tax payers in other countries really puts Canada at a considerable financial disadvantage relatively and the hearty support which all Canadians, great and small, have given to the movement can be taken as the willing sacrifice of Canadian tax payers to contribute this handicap as their share in the noble endeavor.

"To disarm" is occasionally given two meanings. One is to throw away or take away a weapon, and the other is the more figurative interpretation, when to disarm is to take away all fear and suspicion of aggression. Let us hope that this movement for physically disarming the world is based on the higher ideal of mutual disarming one another by impressing the feeling that there is no need for armament.

A COURTESY AND A SUGGESTION.

On Thursday of last week the Publisher of the Pulp and Paper Magazine with the Advertising Manager and Editor and the Superintendent of the Garden City Press, with a few friends, were accorded the privilege of visiting the Mille Roches plant of the Provincial Paper Mills. The Manager and Superintendent with others connected with the mill, extended the visitors every courtesy in showing them about the plant and explaining the process, and brought a very pleasant outing to a happy ending by organizing a trip by automobile, to the Long Sault Rapids. This trip was interesting for several reasons, most important of which is that the party could see one of the proposed locations for the great international power project which is being investigated by an International Commission. Just below where the party stood was the point where the Rapids King ran aground a few weeks ago. Finally the beautiful park, past which tumble the vast volumes of water which the St. Lawrence carries from the heart of the continent, is a park which has been presented to the town of Cornwall by Mr. Ault of the well known firm of ink makers, Ault and Wiborg.

The visit was very pleasant indeed, bringing as it did, an opportunity for a chat with old friends. In the course of conversation, a suggestion was made which it seems worth while to pass on to the paper industry.

The discrepancy in price between American papers in general, with the possible exception of newsprint and similar grades in Canada, was under discussion and the fact was brought out that an important reason for these differences is the number of changes which must be made by the paper maker to accommodate the occasional necessity of paper consumers in Canada. In other words the field does not offer the same opportunities for manufacturing in economic quantities the variety of grade, weight and color which is at present called for. The visitors in this case had an opportunity of seeing a machine shut down to make a change of grade, during which it was obvious that there was an absolute loss of production during this period while overhead and wages expenses continued. It was evident furthermore, that a considerable weight of paper run through the machine toward the end of the finished order was not acceptable and that a larger amount of the new order had to be discarded before running conditions were entirely correct and the color, weight and quality of the new order exactly matched the sample. Someone remarked that the paper torn from the reel was not wasted as it was returned to the beaters, but this person quickly recognized his mistake in assuming that there was no loss in this procedure when it was pointed out that all of the power, all of the chemicals, and all of the time required for preparing this stock a second time for the machine was a total loss.

These losses are incurred in greater or less extent every time where such a change is made on the machine, sometimes the loss is greater than others but there is always some loss. This loss becomes more prominent in proportion as the size of the order is less, that is, if a mill is required to lose production equivalent to 200 pounds of paper on a one ton order, the loss is 10 per cent, which must be added to the selling price, while if the order is for 5 tons the loss will be only 2 per cent. To interpret this in terms of the needs of Canadian publishers and printers, is to say that if 5 publishers, who had been using a slightly different char-

acter of paper and each required, say, a ton a month which necessitated in each case a loss of 10 per cent to the manufacturer, should compromise on a single standard it would mean that the mill could make a single order of 5 tons at a time and cut the operating change loss to 2 per cent. As a matter of fact, it would do better than this because the mill, knowing there were likely to be 5 similar orders the next month, could run at least a 50 per cent. over production on the initial order, which would provide a stock for immediate shipment to any one of the five customers at any time.

This is only one illustration of many possible circumstances and while figures have been arbitrarily assumed, the ratio would hold for other amounts. It could furthermore be at least imagined, that in arriving at a compromise standard of color, weight and quality, the customers might be willing to use a paper which was already being manufactured in much larger quantities for some other customer or which could be made more easily and cheaply than the paper first considered essential by the user. This, of course, would make the manufacturing cost still less and we should think the customer might properly expect an equivalent benefit.

Great advances have been made in the last few years in standardizing and it seems that a further step could be taken if the printers and publishers could be got together with a view to further standardizing the many odd ideas of paper requirements which the mills at present have to meet. It would seem to be an entirely appropriate matter for the Book and Writing Section of the Canadian Pulp and Paper Association to invite the co-operation of users of these papers and to make arrangements, if the idea should be acceptable to their customers, for a convention to go thoroughly into this question. It is sometimes given as a reason for the importation of foreign papers that the customer could get anything he wants in the way of oddities and in small lots from manufacturers across the line, perhaps realizing and perhaps not, that this small lot which seems a fair order to him may be but a small fraction of the order made by the mill, and from which the major part had already been disposed of as a regular product. On the other hand to make this small quantity as a single order could probably not be accomplished at double the figure by a mill that had to make it as a separate order. There will probably be always people who will want something sufficiently odd to be a little bit different from what the other fellow has but when the cost of the oddness is brought home, it may be found expedient for the owners of such ideas to blend them in order that Canadian industry may be conserved and supported to the extent of their business needs. If such a conference could be held within visiting distance of a paper mill, the consumer would have an object lesson that would be an eye-opener.

In any case, any success whatever that might attend an attempt to increase the quantity of paper made and used in Canada is not simply a help to the industry here but the benefits spread in all directions. To reduce manufacturing cost and selling price is to increase the probability of greater paper consumption in Canada.

COBWEBS.

The return of Premier Meighen is awaited with interest by paper men in order to discover the prospect of a favorable tariff arrangement with regard to import of Canadian paper to Australia.

Don't get the idea that there is no loss when a fire burns a lot of slash without getting into the standing timber. The probabilities are that Nature's efforts of several years to reforest the area have gone for naught, with the destination of young growth and even the seeds that may be in the top soil. *Every fire causes a loss.*

While Canada's trade balance with the United States is unfavorable in the ratio of $766,393,077 against $501,933,266 for the 12 months ending with June, our trade with the world showed exports worth $1,113,336,822 and imports of $1,085,311,676. The situation is materially better than last year, both for the year and for the months of June, in respect to trade balance.

Every Canadian manufacturer should be a regular reader of the Weekly Bulletin of the Department of Trade and Commerce, Ottawa.

The record of ballots cast by the various locals of the International Brotherhood of Paper makers on thirty-one propositions submitted to a referendum vote shows clearly that each member can, and apparently does, register his own convictions. The totals in no case showed an unanimous vote and one proposition passed by a majority of only 162. It is noted that several local majorities were opposed to the general majority. The results, however, show that members of this union are independent thinkers.

SERIOUS FIRE IN CAPE BRETON.

A telegram from Nova Scotia tells of a serious fire that has swept the forest near Neils Harbor, Cape Breton, burning an area 40 miles long by 5 miles wide, and destroying several hundred thousand cords of pulpwood. The fire seems to be under control, owing to rain on Sunday morning, but it is liable to break out again on account of the high wind prevailing. The blame for starting the fire is laid on mining prospectors.

A crazy rumor has been printed in the United States that a contract has been made for the shipment of 600,000 cords of pulpwood to Holland. There is no pulp mill in Holland, and pulpwood from the Baltic or Germany would be cheaper than Canadian wood, even if such were to be had.

Electric Steam Boilers in Pulp Mills

Although electric boilers have been in use for several years, they have only recently been seriously considered. But with the enormously increasing prices of fuel, the possibility of using electricity on a much greater scale has received a good deal of attention. Technically, the problem of producing steam by electricity presents few difficulties.

Electric boilers have very great advantages over the ordinary fired boilers; they occupy little space, are easily mounted in the mills and, above all, they are independent of chimneys and smokestacks. The care of the electric boiler is quite simple, as they generally require nothing but an attendant to manipulate the switches and regulate the feeding. In most cases, the construction of the boiler is such that the efficiency of the attendant is of little importance, because the steam is made automatically and with absolute uniformity. Boiling dry and subsequent inconvenience, danger of explosion, etc., are eliminated. In electric boilers incrustation does not occur, since all the waste matters or sludge drop to the bottom, whence they can be easily removed by the blow-down process.

The problem is chiefly an economic question. To illustrate this part of the subject, the following figures are given: 1 kilogram of coal (2.2 lb.) of average quality will produce about 6,500 calories. If we figure on a boiler efficiency of 70 per cent., 4,500 calories will consequently be obtained in the steam. If we do not include the loss in conversion, 1 kilowatt corresponds to 856 calories. If the efficiency of the electric boiler is 96 per cent., there will consequently be utilized about 822 calories. Comparing these figures we find that 1 kilowatt corresponds to about 0.4 lb. of coal (anthracite). On this basis it may be calculated in what instances it will be profitable to produce steam by electricity.

If an industry has to purchase the electric power, the price, of course, may vary for different reasons. One way is to pay a fixed price per kilowatt. In such a case the prices of coal and power compare as follows:

	Per ton of coal corresponds to about
30 kr. (Approx. $ 7.00)	0.54 ore ($.0012) per kw.
50 kr. (Approx. 11.50)	0.88 ore (.002) per kw.
100 kr. (Approx. 23.00)	1.77 ore (.004) per kw.
150 kr. (Approx. 34.90)	2.66 ore (.006) per kw.

If, however, the electric power costs a certain sum per kilowatt year, another result will be reached which, of course, will depend upon the number of working hours per annum. It is clear that with longer working hours it is more economical to use electricity. To illustrate this the following figures are given:

A. 7,200 working hours:

	Per ton of coal corresponds to
30 kr. (Approx. $ 7.00)	38 kr. ($ 8.75) per kw. yr.
50 kr. (Approx. 11.50)	65 kr. (15.00) per kw. yr.
100 kr. (Approx. 23.00)	129 kr. (31.00) per kw. yr.

B. 3,600 working hours:

	Per ton of coal corresponds to
30 kr. (Approx. $ 7.00)	18 kr. ($ 4.15) per kw. yr.
50 kr. (Approx. 11.50)	32 kr. (8.00) per kw. yr.
100 kr. (Approx. 23.00)	65 kr. (15.00) per kw. yr.

The foregoing calculation postulates that first-rate power is used. When the power is of this nature the economical factor will largely depend upon the price of coal, and there is consequently a certain force in the argument that the use of electric boilers will be somewhat restricted in the case the price of coal returns to normal. There is, however, another field of activity for electric boilers in which they are practically in no wise dependent upon the coal market.

This boiler utilizes in the production of steam all the surplus power that is now wasted. Such surplus power will be found in all industrial works with an individual power plant, the energy of which is not continuously consumed; or at industrial works paying for electric energy on the basis of maximum consumption, regardless or whether the power is used for a longer or shorter time. Further, some of the larger power plants have considerable surplus power at certain periods of the year when the supply of water is plentiful, and during certain hours of the day—a surplus of which it is hard to dispose with an advantageous result. Much attention is paid to this disposal in Sweden, where all power plants owned by the Government endeavor to employ this surplus energy for the production of steam.

The cost is modified by the scheme which provides for the payment of the cost on a sliding scale, so that the price of the power always keeps relatively below the market price of coal. So much may be said of the economic aspects of the production of steam by electricity.

To form a judgment as to the size of the boiler plant needed, the estimate may be made on the basis of the steam required, or on the basis of coal consumption. Based on the steam requirement, the calculation must determine the quantity of steam that can be developed at different temperatures of the supply water. To illustrate, the following figures are given: With a steam pressure of 12 kilogams to the square centimeter and a feed-water of O°C, there will be developed about 1.23 (2.7 lbs.) kilograms per kilowatt hour, and—

	There will be developed about
at 30° C. feed Water Temp.	1.28 kilograms (2.8 lbs.)
at 60° C. feed Water Temp.	1.35 kilograms (3.0 lbs.)
at 80° C. feed Water Temp.	1.40 kilograms (3.1 lbs.)

On the other hand, if the calculation is based on coal consumption, one ton of coal, as we know, corresponds to about one H.P. year. For example: A pulp mill needs for producing steam, 800 kilograms (1,760 lbs.) of coal per ton of pulp. If the output of the mill is 10,000 tons of pulp a year, this quantity will correspond to a consumption of 8,000 tons of coal, or in other words, 8,000 H.P. year, which is roughly equivalent to 6,000 kilowatts.

Electric steam boilers are generally of two types; boilers with resistance cells and boilers with electrodes. In the case of the former, the electric energy is converted into heat in the cells, whence it is conducted to the water. The cells are either open with the conducting parts in direct contact with the water, or enclosed

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Lecture by Captain Olsson before the Technical Association of Paper Manufacturers (Sweden,) November 24, 1920. Translated by Dr. Paul Bartholow, from Papir-Journalen, December 4, 1920, for the News Print Service Bureau.

in tubes or other suitable material. An alternating current should always be used with open cells or elements, for otherwise the water would be decomposed; in the case of closed cells, both an alternating and a direct current can be used. The electric boilers provided with resistance elements can only be used for a voltage up to 800.

Boilers with electrodes can be used both for low and high tension, but only with an alternating current. The electrodes conduct the current into the water, which itself forms the resistance cells, converting electric energy into heat. The electrodes are either insulated or non-insulated; in the former case, the object is to lengthen the path of the current through the water. In low tension boilers the electrodes are non-insulated; in the high tension devices they are usually enclosed in a casing. In the mills, most of the boilers are of high tension, since the current employed is generally high tensioned. By carrying the current directly into the boilers, all special transformers are avoided, these devices being always rather costly.

The Apparat-Aktiebolaget, of Stockholm, manufactures electric boilers of low and high tension types up to 20,000 volts. They are built in various sizes up to 8,000 kilowatts, and are of upright or horizontal plan. Some of the results obtained with these boilers are shown in the table. They have been installed during the past year, have no loose parts, and are consequently most accurate in operation. The dryness of steam, as we know, depends largely upon the efficiency of the boiler; in the case of these boilers the efficiency is equal to that of the ordinary coal-fired boilers. The dryness of the steam is sufficiently high to enable it to be used for engine power.

The electrodes are generally inserted in the lid of the boilers, and are arranged in groups of three and three, each phase being opposite to the three-phased alternating current. The number, of course, varies with the size of the boiler. A screen is provided inside the boiler to ensure a better circulation. Owing to this arrangement, the circulation is very even, which is important, because the resistance of the water is thereby maintained at a uniform level. Waste of the current is thus avoided.

The conductor, passing through the water, ends in an iron shoe, which is in direct contact with the fluid. The iron shoe, or as it is generally called, the electrode, is enclosed in a porcelain tube, the size of which depends partly on the voltage to be used, and partly on the resistance of the feed-water. This feed-water varies considerably when taken from small lakes and rivers. It has been shown at some of the electric boiler plants built by the Apparat Aktiebolaget, that the resistance of the water varied between 4,000 and 42,000 Ohms per cubic meter. These extremes, however, are very unusual. The resistance generally is about 25,000 Ohms per cubic meter.

The way in which the production of steam is regulated is of great importance. It is effected by means of a combination of different systems. The coarser mechanism consists in switching on or off a larger or smaller group of electrodes. If no exterior cause prevents, the current may be regulated by connecting and disconnecting a certain number of individual electrodes within a number of groups. In all cases the most accurate or delicate regulation is effected by changing the resistance of the water. When the boiler has been in use, there is always present what we may call spent water, which as a conductor, is much superior to fresh water. By means of a mixture of fresh water—a poor conductor—and spent water with its greater conductivity, the resistance of the water can be regulated within fairly wide limits. The production of steam is regulated in the same way. The quantity of water to be added or removed for this purpose is small and of no influence on the efficiency of the boilers. Moreover, the boiler is adjusted to carry a certain charge—a matter of no difficulty—and it is only necessary once a day to equalize the mixture in order to maintain a constant charge. It must also be recalled that the resistance largely depends upon the temperature of the water, being lessened as the temperature rises.

The actual working of the electric steam boiler in the pulp and paper mills of the Wargon Company may be thus described. In this connection, an important factor is that the company has a central electric plant. The installation consists of seven electric boilers each 2,000 kilowatts, with a voltage of 10,000 and pressure of 12 kilograms per square meter.

The results have been eminently satisfactory in these mills. The company has drawn attention to the facts in a report which contains the following: "Practically all the steam necessary for both sulphite and sulphate mills is produced by electric boilers. To attend them only one man is required per shift. Compared with our coal-fired boilers, we save a force of about seventeen firemen, sixty-five tons of coal per day, and all the labor, tonnage, and rolling equipment which was required for transporting, transhipping, discharging and conveying coal and ashes. The boilers work efficiently with nearly 10 per cent. profit. They produce about 1.25 kilograms of steam at 10 kilograms pressure per kilowatt hour. To get up steam after a standstill only requires from 10-20 minutes. The operation is simple, convenient and clean."

WAYAGAMACK WON FOOTBALL CUP.

Wayagamack defeated Shawinigan in Cup Final of the St. Maurice Valley Association Football League held in Three Rivers on July 19, 1921.

A large crowd being in attendance who were very enthusiastic, and had a good afternoon's sport. Wayagamack running out winners by 5-0, although Shawinigan deserved a goal or two on the day's play. Hamilton, Smith, Stewart and Cameron starred for Wayagamack, while Munro, Pink and Murray were the best on the Shawinigan side.

The teams were as follows:—

WAYAGAMACK—Goal, Gamble, right back, Vining, left back, Hamilton, right half, Laird, centre half, Smith, left half, Stewart, (Capt.) outside right, Ormrod, inside right, Kershaw, centre, Ewen, inside left, Hunter, outside left, Cameron.

SHAWINIGAN—Goal, Pink, right back, Lang, left back Geddies, right half, Munro, centre half, Murray, left half, Verdon, outside right, McLaughlin, inside right, Barr, centre forward, Robertson, inside left, Millar, outside left, DeKindren.

A word of praise is due to Capt. Clarke of Grand Mere, who refereed the game very efficiently, and kept the players well in hand, he had no easy task, as a Cup Tie Final is always productive of extra excitement, and keenness.

It is better to have done one's best and lost than to have done one's worst and won. Shirk and you

Getting Back to Normal*

By J. B. LAWRASON, Toronto.

If I could successfully solve for each and everyone here this afternoon, this problem, many of our troubles would be over, but like everything else, one can but take from his own experience, along with the knowledge we have of things in general, and from these, to make a few suggestions that may be helpful in untangling the problems of getting back to normal.

It may be well for us to look back over the past few years, and refresh our minds as to what has brought us to the present conditions. Back in the years before the war, the materials that the average Box Manufacturer used, were some of the most stable in price of any on the market; from year to year, the price varied but little. It has been said that paper and paper products had but one price.

Then we came to the early days of the war, face to face with the uncertainty of the future, prices were shot to pieces. I believe that this is true in the memory of everyone present, that they never saw the value of materials go so low. Then came the activity of the war period, with the depletion of the world's market of manufactured and raw materials. Along with the inflation of credit came the increased value of all kinds of goods and materials. With this condition, it took very little to create what we have gone through, and was known as a war business boom. We do not want to forget that along with this business boom, we find a tremendous increase in the world's productive power.

These conditions continued till the middle of 1920, when we came to, and began to realize the fact that the world was again entering into a period of re-adjustment and lowering prices. It is the meeting of these conditions that you and I are interested in to-day. I would like to say that the conditions that we have here in Canada are not local but international, we find that all countries are going through the same thing. I would also like to say that we have watched with a good deal of interest the re-adjustment that our friends to the South have been going through. The position in Canada is far different than it was back in 1914. At that time, we entered the war, as it were, in swaddling clothes, and we came out a Nation, with new ideals and new ambitions in world affairs. I am of the opinion, as business of the future unfolds itself internationally, that Canada is going to be more of an important factor. With the tremendous natural resources that we have, along with a people who are ambitious and willing to work, we can not help but be heard from.

We appreciate the friendliness of our American friends, and I believe that if the English speaking peoples, with their common language, their common ideals, and their common traditions are willing to pull together, it would have a greater influence in bringing the world back to normal conditions than any other single combination that could be suggested or thought of. Two things are absolutely essential in working out the problems that we have on hand, not only among the members of this Association, but nationally and internationally, and that is faith and confidence in each other.

Easy business is over, during the last few years, a good deal of money has been made not alone by our ability as manufacturers, but by the opportunity the increased value of goods has given us to make money by merchandising; we were continually selling in a sellers market. Those conditions are now reversed, and we will need to look well to the new conditions, for largely the money that we will now make, it will be made as manufacturers, and the money we lose, will be lost in merchandising.

We are also going to find that, by the tremendous expansion that has taken place during the last few yeras, we are going to have a heavy charge upon our hands in idle plant. I am of the opinion that the expansion of the Paper Box business has been such, that it will take five or ten years of normal growth before the entire capacity of the plants of Canada can be used to their limit. With these facts before us, never as manufacturers did we need to be more careful, and use the factors that we have for making profit, than we do now. If we lose as manufacturers, and also lose in the merchandise that we are handling, the outlook and result is bound to be serious; it means depleted resources, and in many cases, depleted resources that it will take years to re-gain, and for this reason, I believe that it is no time for cutting or slashing of prices as some think it is.

The successful business is the business that makes a profit whether that business is large or small. Is it not true, that the corner store that is doing business and making a profit, is a far greater success than the great departmental store that is losing money? I am not arguing for small business, nor am I arguing for big business, but the point that I wish to make and emphasize is this, that the essential thing in doing business is the profit we make in doing that business, and to draw upon the resources that we have made in the past, for the present conditions, is false economy.

New Business.

The problem that we have before us this afternoon, is also a very practical one, getting back to normal will mean that we will have to use our creative ability in a wider sense than we have ever used it before, it will be our business to try and make two blades of grass grow where one grew before. It will be our business to try and create packages in such a way that they will have a real selling power for the manufacturer, and a tremendous appealing power to the buying public, to place the goods of the manufacturer in such an attractive way, that we are going to develop a lot of new business that otherwise would lie dormant, our whole energies will have to be bent in this way, to my mind, it will be far better business to try and develop and create than to compete.

Costs.

We will also need to watch costs, we are not going to have the wide spread of margin that we have had during the last few years. Economy in manufacturing, and in overhead expenses will have to be given consideration. Cost systems and their careful following up, will need to be given more attention than they have in the past so that we will know exactly what we are

*Address delivered at the Annual Meeting of the Canadian Paper Box Makers' Association, Hamilton, Ont., June 24, 1921.

doing. We will have to put into operation our plans and schemes of taking care of those things that probably during the last few years have been lying idle through the easy business conditions which we were going through.

Selling.

I remember of being at a meeting of a number of manufacturers a year or a year and a half ago, when one of those present said that they did not need any longer to have salesmen, that their goods were selling themselves. Here again, is another department of our business that will need our careful attention; selling the products of our factories, to develop the idea that the successful salesman is a man who can go out and sell goods at a price that will yield a profit. If there is going to be any profit made in the goods we are selling, the salesman and selling department are going to be something more than mere order taking propositions. A good deal can be done in training and developing our selling forces, that will have a lot to do in getting, and stabilizing prices.

Service.

How little we have heard of service during the last few years. Well do I remember when this was one of the essentials of the success of any business, but we have almost forgotten that this was necessary during the last while back, but again we are at the time when service will play a very important part in the success of our business, and service of quality will be just as important as service of delivery.

Labor.

How easy it is now, for capital to be unjust to the workers, but I am of the opinion that now is a golden opportunity for employers as a whole, to show justice and fair dealing to those who make it possible for industry to be carried on, for they have their problems of getting back to normal conditions, that will need our greatest consideration and practical sympathy.

Cutting of Prices.

We have heard so much these days about cutting of prices. The very fact that we are out cutting prices shows how quickly we are overcome by the general conditions that prevail. I do not believe that anybody gains by cutting prices, it is one thing sure, that the seller does not, and I have yet failed to meet the customer who will thank one for cutting prices, because I believe that there always lurks in the back of the buyer's mind that the seller who will cut his legitimate profit on a job is nothing but a fool. These may be strong words, and we may not like to apply them to ourselves, but when we face the fact, and size up the harm it does, not only for the present, but for future business, can we say anything less, when we allow ourselves to develop these conditions.

This is a time, when if we want to get back to normal, we will need to take a broad view of business, and not only on what we are going through to-day, but also to look well ahead to the future, for what we sow to-day, we will reap to-morrow. I am of the opinion that if we have, as I said at the very beginning, Faith and Confidence in our own business, and each in the other, that we will be surprised how quickly we will get back to normal business. If we put into effect the reasonable and common-sense way of handling the conditions that we are going through at the present time, we will find that, when the sum total is made up, we have not done so badly, that we have made a profit, and have conserved those conditions that we have been developing and building up during the past few years, not only for our own benefit, but the benefit of the Association, and the industry as a whole.

TEXTBOOKS ON PAPER MANUFACTURE.

Subscriptions are being taken for the new textbooks on the manufacture of pulp and paper prepared under the direction of the Joint Committee on Vocational Education of the Pulp and Paper Industry, a complete set of which should be owned by every firm or individual connected with the industry.

The set will be complete in five volumes. Volumes I and II, deal with arithmetical operations, elementary mathematics, drawings, etc. Volumes III, IV and V, to be issued later, will deal with pulpwoods and their preparation; manufacture of pulp; analytical methods; and paper manufacture in all its aspects.

Volumes I and II are now on sale at $5.00 a volume. In the selection of class-room problems bearing on the principles and practice of pulp and paper manufacture they represent the highest standard in textbook publishing.

These books are distributed in Canada for the Pulp and Paper Association by the Pulp and Paper Magaine. Orders are received only for full sets and must be accompanied by remittance of $10 (Canadian) for the first two volumes; other volumes to be paid for as issued.

Readers in the United States should send orders, with remittances, to Thomas J. Keenan, secretary of T.A.P.P.I., 542 Fifth Avenue, New York.

The Paper Makers' Building Association has been incorporated in New York State for the purpose of holding, for the benefit of the International Association, the head office building at 25 South Hawk St., Albany. The members are J. T. Carey, Pres. and Treas.; W. B. Clements, Sec.; and G. J. Schneider, M. H. Parker, James Lockword, and D. McDermott.

Canada, with exports of $506,104,304 in eleven months, leads the countries from which the United States imported goods, and was the second best customer of Uncle Sam, with imports of $739,833,270. In this period the trade balance, though still greatly adverse, was improved by $64,192,030.

NORWEGIAN PAPER.

Paper is, next to cellulose, Norway's most important article of export. The first paper machine came to Norway in the year 1838, but it is only during the present century that this branch of industry has reached the advanced position which it now holds in Norwegian industries. From 1903 to 1913 the production has more than trebled. During the last-named year 85 paper machines were in activity distributed over 44 mills. The whole production of paper in Norway in the year 1913 was about 210,000 tons, of which about 180,000 tons were exported. The Norwegian export of paper to the United States was over 4,000 tons in the same year, but this decreased later on account of the war, so that in the year 1917 it was only 1,465 tons.

The Trade and Commerce Weekly Bulletin for July 25 contains a detailed review of conditions in the Republic of Columbia, with directions as to tariff, documents, etc.

Pulp and Paper Exports for June

Total exports of pulp, paper, and pulpwood for the month of June 1921 show a considerable shrinkage from the figures for June 1920, which, however, is comparing what is likely to be the dullest month of a depressed period with what was pretty nearly the record month of a period of unusual commercial activity. We find shipments of book paper and newsprint to total about the same as for the month of May but with other papers showing a value on June exports only about half of those for the previous month. (In making the comparison between this report and the report for May which was published in the Pulp and Paper Magazine for June 14th we find an error in the total of paper only for the month of May 1921. The amount should be $5,263,247.) While this showing of paper exports gives a decrease for the month of June over the same period last year of a little more than $3,000,000 we find that the exports for the three months ending with June are only $4,000,000 less than the same period during 1920 and are nearly $3,000,000 **more** than for the same period in 1919. It must be remembered, however, that capacity has increased in the meantime so that even the greater export does not necessarily mean the same ratio of possible production. It must, too, be borne in mind, that values have been dropping so that $1,000 now means a greater production than was the case this time last year.

When we come to examine the figures on pulp, we find a considerable decrease in every item and this applies to both quantity and value. Total exports for woodpulp for the month of June were just about 1/3 of the very gratifying quantities last June, while the values are slightly less than 1/3 of what they were for that month. Comparing the three months period, we find a little more encouragement too, in the case of

EXPORTS OF PAPER, WOOD PULP AND PULP WOOD.

		Month of June		Three months ended June.		
		1920	1921	1919	1920	1921
Paper and manufactures of						
Book paper	Cwt.	7,834	1;743	6,468	14,953	9,421
	$	85,090	20,546	70,145	149,290	123,251
Newsprint paper	Cwt.	1,445,917	847,604	3,122,754	3,686,749	2,680,430
	$	6,426,259	4,295,181	10,971,624	16,189,356	14,219,467
Other paper and manufactures of	$	1,366,391	247,781	1,851,415	3,207,794	1,215,691
Total paper	$	7,877,740	4,563,508	12,893,184	19,546,440	15,558,409
Wood Pulp—						
Sulphate (Kraft)	Cwt.	230,907	146,824	463,014	626,397	402,977
	$	1,200,406	541,488	1,492,935	2,821,996	1,630,003
Sulphite, bleached	Cwt.	163,668	118,721	237,233	454,885	247,801
	$	1,180,028	602,200	1,146,122	2,889,240	1,365,187
Sulphite, unbleached	Cwt.	678,836	187,250	665,924	1,558,920	473,392
	$	3,873,975	711,664	2,610,236	7,798,778	1,855,307
Mechanically prepared	Cwt.	892,309	196,090	1,000,222	1,370,412	586,459
	$	2,136,767	370,072	1,194,597	3,422,846	1,255,787
Total Wood Pulp	Cwt.	1,965,720	648,885	2,366,393	4,010,614	1,710,629
	$	8,391,176	2,225,424	6,443,890	16,932,860	6,106,284
Pulp Wood	Cord.	107,029	75,635	206,317	224,110	203,566
	$	1,252,994	1,013,933	2,025,714	2,515,470	2,709,288
Country of Destination.						
Paper and manufactures of—						
To United Kingdom	$	470,940	66,735	793,101	1,122,153	192,604
United States	$	6,062,104	4,138,756	10,203,456	15,463,388	13,605,102
Other Countries	$	1,344,696	358,017	1,896,627	2,960,899	1,760,703
Wood Pulp—						
To United Kingdom	$	1,298,678	178,155	664,780	2,009,902	876,676
United States	$	6,614,130	1,802,563	4,644,736	13,737,988	4,630,825
Other Countries	$	478,368	244,706	1,134,374	1,184,970	598,783
Pulp Wood—						
To United Kingdom	$	.....	.....	.....	.....	.....
United States	$	1,252,994	1,013,933	2,025,714	2,515,470	2,709,288
Other Countries	$	.....	.....	.....	.....	.....
Total Paper, Wood Pulp and Pulp Wood—						
To United Kingdom	$	1,769,618	244,890	1,457,881	3,132,055	1,069,280
United States	$	13,929,228	6,955,252	16,873,906	31,716,846	20,945,215
Other Countries	$	1,823,064	602,723	3,031,001	4,145,869	2,359,486
Totals	$	17,521,910	7,802,865	21,362,788	38,994,770	24,373,981

pulp; though the 1921 figures are even slightly less than 1919 figures for the same period and the quantity also is slightly less. The figures for pulpwood, while showing a decrease for the month of June, show a progressive increase in value with very little change in quantity for the three month period of 1919, 1920 and 1921.

The depressed conditions in the United Kingdom are reflected distinctly in the marked decrease of exports to the mother country. In fact, exports have fallen off to only about 1/7 of the values for June 1920 while total exports (including pulpwood) to the United States fell off only to ½ and to other countries decreased to 1/3. Again referring to the three month period we find England's purchases down to about 1/3 of those for the period for 1920 but to only slightly less than the period for 1919. Purchases by the United States were 2/3 of the values for the last year and 25 per cent. greater than for the corresponding period in 1919. Other countries bought more than half of what they did in the same three months in 1920 and more than 70 per cent of their purchases in 1919 for the same period.

Summing up the totals we find shipments for the month of June to total $7,802,865 as compared with $17,521,910 for June 1920, or a decrease of something over 50 per cent. Referring to the three months period we find the totals running almost exactly in proportion to United States consumption.

In studying the figures given in the accompanying table, the reader should bear in mind that a considerable number of paper mills were closed during the months of May and June while May shipments could be made from April production. It is therefore, to be remembered that this period is the climax in industrial and labor conditions in England and the period which close observers believe has recorded the bottom of industrial depression in the United States. The sales of pulp show distinctly the state of general business across the line and while the month of June shows a rather poor trade compared with the same month a year ago. the three months period shows a pretty fair total of business. It is probable that the months of July and August will not show very much improvement over the report for June but the general standardizing of business conditions and return of confidence among manufacturers and buyers generally will be reflected before long in the monthly exports of Canadian pulp and paper.

NEWSPRINT IN THE UNITED STATES.

In connection with the above, the following extract from the last report of the Federal Trade Commission with the regard to newsprint will be of interest.

The average production of total newsprint and standard news, based upon the total combined production for the years 1918, 1919, and 1920, amounted to 117,442 tons of total newsprint and 105,716 tons of standard news, for a period corresponding to June. The actual production amounted to 86,770 tons of total newsprint and 79,769 tons of standard news, which for total newsprint was 26 per cent below the average for the three-year period and for standard news about 25 per cent below the average.

The production of newsprint for June, 1921, compared with June 1920, shows a decrease, amounting to 33 per cent for total newsprint and about 33 per cent for standard news.

The production for June 1921, compared with June 1919, shows a decrease of 24 per cent for total newsprint and 18 per cent for standard news.

The decrease of production for June, 1921, over June, 1918, amounted to 19 per cent for total newsprint and 18 per cent for standard news.

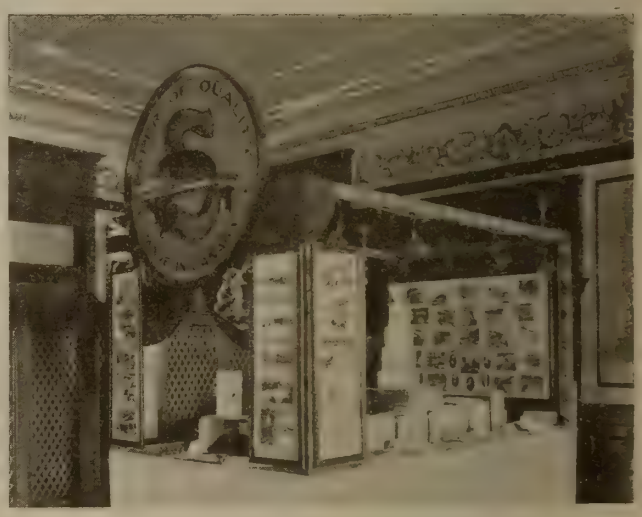
Mill stocks of both total newsprint and standard news decreased during June, 1921.

Averages Prices Paid by Publishers.

The weighted average price of contract deliveries from domestic mills to publishers during June, 1921, f.o.b. mill, in carloads lots, for standard news in rolls was about $5.227 per 100 pounds. This weighted average is based upon June deliveries of about 33,000 tons on contract involving a total of approximately 570,000 tons of undelivered paper manufactured in the United States.

The weighted average contract prices based on deliveries from Canadian mills of about 16,000 tons of standard roll news in carload lots, f.o.b. mill, in June, 1921, was $5.322 per 100 pounds. This weighted average is based upon the June deliveries on contracts involving about 255,000 tons of undelivered Canadian paper.

The weighted average market price for June of standard roll news in carload lots, f.o.b. mill, based upon domestic purchases totaling about 7,000 tons was $5.129 per 100 pounds.



Fine Exhibit of Canadian Paper.

This picture shows the exhibition at the Jubilee Convention of the Canadian Manufacturers' Association in Quebec which was arranged by the Howard Smith Paper Mills. It attracted a great deal of attention and Mr. Rodier and Mr. McLean were kept busy answering questions on the manufacture and uses of paper. Samples were shown of the raw material and the partially manufactured paper at various stages in the process. Samples of the finished product were shown to demonstrate the various uses of the different kinds and grades of the finished paper. It is anticipated that the example of the Howard Smith Paper Mills will be followed at future conventions of the C.M.A. and on similar occasions by other paper manufacturers who are beginning to realize the importance of showing the public the excellent material and service which the Pulp and Paper Industry of Canada is prepared to supply and render.

Forestry in Norway

By EDWARD BECK, Publicity Department, Canadian Pulp & Paper Association.

Norway has been in the business of forest cultivation for more than sixty years. In 1907 the golden anniversary of the beginning of Norway's present efficient forestry system was officially celebrated. A volume containing a history of the development and progress of the forests was published. The lapse of sixty years, however, has, according to the leading Norwegian forest authorities merely enabled them to make a fair start. Norwegian forests, they say, are still in their infancy; cultivation ought to have begun a century before it did. They are hoping to make up for lost time.

There are in Norway, as in Sweden and Finland, both State and private forests. The latter largely predominate. Altogether, the forest lands comprise about 28,000 square miles, or about 23 per cent of the country's total area which consists of about 124,450 square miles. Compared with Canada's forest area that of Norway appears almost insignificant, yet Norway regards her forest possessions as of the utmost importance and spares neither money nor effort to keep them in a state of constant production. Her national vitality depends upon them.

Norway's natural resources are strictly limited in extent. The supply of timber ranks among the first and most important. It furnishes the main source of Norway's export trade and provides fuel, building material, and other wood necessities for home consumption. One-sixth of Norway's laborers find their employment in the wood-refining industries; one-tenth in the paper industry. Norwegian railways derive more than 12 per cent of their total traffic revenues from the pulpwood, cellulose and paper industries; some of the railways depend almost exclusively upon the revenues so derived. Appreciation of these facts has not only led Norway to the adoption of a policy of strict conservation of her remaining forests, but also to employ all available means for the building up of a forest supply for the future. Today the country is not forest self-sustaining and is obliged to import considerable quantities of wood from Finland. Formerly wood was also freely imported from Russia.

The productive timber lands of Norway consist of about 21,825 square miles, of which 11,500 are held by peasants and other small owners, 5,575 by incorporated companies, and 4,750 by the State, the latter including communal lands, parish and other endowments. The tendency at present is to discourage the further acquisition of forest lands by private owners. Incorporated companies are, in fact, debarred by law and from increasing their holdings by purchasing lands from peasants and other individual holders. Wherever possible and practicable the State is resuming ownership of these lands and using them to build up new forests.

Private ownership in the past, before the State established control of the forests, was charged with wasteful methods and irresponsible care, resulting in depleted and sterile forest lands. These practices are what led to the present national forest policy. The private owners of today, however, need no restrictive laws to compel them to do their duty by their forests. They have long since learned their lesson. The forests lands owned by the incorporated companies in Norway are the best kept of any, as well as the most prolific in their annual yield. The companies spend much more proportionately than does the State on their upkeep.

However, Norwegian forest laws do not leave it entirely to the owner to say what shall be done. The owner cannot do as he pleases with his woods. All cutting is done under government prescribed regulations. So-called clean-cutting, which is permitted in Sweden and Finland under certain conditions, is practically prohibited in Norway. Selective cutting is the only approved method. All cutting is done with regard to its effect upon the standing forest rather than for the immediate yield. Norwegian foresters are unusually successful in maintaining their forests by natural means. Seeding and planting are seldom resorted to, cutting being done in such a way that Nature replants the cut-over area in a remarkably short time, maintaining the forests in a state of constant development.

The State and the private owners work well together and the results obtained are the best. Violations of the regulations are very rare. The State is also generous in its support of the forest industry generally and does everything possible to encourage its development.

Coniferous timber areas are estimated to represent about 82 per cent of Norway's total productive forests, Scotch pine and white spruce constituting the principal species. The State Forest Department, which administers the public forests and supervises the administration of those privately owned, is now engaged in completing a survey of the country's total timber resources which, when completed, is expected to lead to further restrictions. An unofficial estimate, covering thirteen million acres of productive forest lands, gives an average of 9.2 cords per acre, or approximately, 3,675,000 cords. The total annual consumption, exclusive of imports, has been calculated at about 1,320,000 cords for the wood-using industries and at about 4,765,000 cords of the wood used for fuel, for construction and other domestic purposes is taken into account. According to this calculation Norway is consuming annually from 25 to 30 per cent more wood than its forests are yielding. This is generally admitted by Norwegian foresters. They say, however, that the discrepancy will be overtaken by the development of new forest areas now under way. For the present, expansion of the saw-mill industry has stopped. A decline in other classes of wood products during the next few years is generally anticipated.

As already indicated, more than half of the productive forest lands of Norway is represented by small holdings, principally peasant properties. The small proportion owned by the industrial companies represents land acquired many years ago. Most of the pulp and paper companies of Norway have to depend upon purchased timber for their raw material, a development which, according to some of the companies, places them at a distinct disadvantage in comparison with similar companies in Canada and other pulp and paper producing countries, and renders their profitable operation somewhat difficult.

Competition between Norwegian wood-buyers for the available supply of domestic pulp-wood is becoming increasingly keen. Most of the mills are located in the south-eastern part of the country on the Glommen, Drammen and Skien rivers, which afford access through their water connections with the best timber

areas of southern and central Norway. Contracts for wood supply are made to run from six months' periods and call for delivery of the wood at the river bank, roughly barked and cut to standard lengths. Timber is scaled and stamped by the purchasers' agents or through competitive timber-driving associations which handle all the timber floated on the principal rivers. Cost of handling wood from point of delivery to mills are pooled and distributed on the basis of quantity and distance. Both buyers and sellers are organized, but conditions do not favor the elimination of competition altogether.

Here, as in Sweden and Finland, much attention is given to the education of foresters and the personnel of those in charge of the forests—the forest-masters and engineers—is of very high grade. The State maintains a number of schools for the development of engineers and rangers, the courses including practical forest experience with theoretical instruction in the class-rooms. A university course in higher forestry is about to be established.

The same freedom from fire risks exists here as throughout Scandinavian forests generally. Well-built roads permeate all the principal forests and little settlements at short intervals of distant provide a permanent and ever-available fire-fighting force whenever required.

The attention given to the housing and care of the forest forces is worthy of note and explains in some measure the eagerness with which the young Norwegians adopt forestry as a profession whenever the opportunity to do so is afforded them.

News From Europe

(Courtesy of Newsprint Service Bureau.)

Minimum Price For German Paper.

Some points of special interest in connection with newsprint were made during the debate in the Reichstag. The publishers, for instance, admitted that there was no profiteering behind the present price, a conclusion which rather surprised the Assembly. As the Berliner Tageblatt remarks: "Dr. Scholtz with refreshing clearness and speaking for the Government stated that an exhaustive inquiry by the Bureau of Paper Tests of the Ministry of Economies had resulted in the fact that the price of newsprint could scarcely be reduced below 2½ cents a pound, without ruining the newsprint mills. In spite of this noteworthy admission of the Minister of Economies the manufacturers have reduced the present price of $4.86 a cwt. by 27 cents. in order to show the publishers that everything possible is being done to accommodate them. But we must point out that at this price 80 per cent of our mills will be unable to show a profit. Moreover the reduction of 27 cents is retroactive to April 1st, and is f. o. b. German ports."—"Papier-Zeitung," May 21, 1921.

NOTE: The figures are calculated on the present value of German money.

The Vienna Paper Market.

Stagnation on the Vienna market, which became so apparent with the beginning of April, has increased if that be possible. Complete quiet in nearly all business rules, and no change is anticipated at the present moment until the autumn. The lack of business is further accentuated by the trickery of the illicit dealer who is dumping his stock on the market at figures 25 per cent below current quotations. In this he is actuated by the acute money shortage and fear of greater losses. Consequently the legitimate trader who has held on for higher prices is unable to meet offerings of this nature. The mills, however, are working their machines despite the above mentioned fluctuations in offerings, and trade activity in this branch of industry continues brisk. The export trade has dropped almost to nothing. Revival of this business is not expected before a marked strengthening of Polish exchange, since at present Poland is the only outside market. But Poland is unable to buy owing to the low value of her money, although in other circumstances that country would be capable of taking large quantities of Austrian paper.—"Papier-Zeitung, June 11, 1921.

Free Imports of Newsprint in Poland.

A proclamation in the Polski Monitor declares that the Minister of Commerce has abolished restrictions on imports of newsprint which are now admitted free of duty.

—"Pappen und Holzstoff-Zeitung," May 19, 1921.

Spanish Newspapers Get a Rebate.

The Spanish Commission recently appointed by Royal proclamation has granted a rebate from the market price to (1) small periodicals consuming 100 tons, and (2) newspapers which have a yearly consumption of at least 100 tons. Newspapers are allowed to import newsprint, although the duty has again been put into effect.

—"Papier-Markt," June 10, 1921.

Free Trade in Newsprint in Czecho-Slovakia.

The Prague newspaper, "Tribuna," states that the duty on newsprint was abolished to 15 carloads a duty on newsprint was abolished June 1st, although imports of newsprint are limited to 15 carloads a month.

Swedish Offering Cheap Newsprint for Export.

The Swedish Newsprint Manufacturers have decided to offer paper in foreign markets at 3½ cents a pound.

—"Papier-Markt, June 10, 1921.

Heavy Decline in Norwegian Prices.

The dullness was broken by a sharp drop in wood pulp quotations on the Christiania exchange. Latest figures are: Easy bleaching, sulphite, 600 kroner per ton; strong, 530; prime sulphite, 800; easy bleaching sulphate, 550; kraft, 500; dry mechanical, 300; wet mechanical, 120; net cash f. o. b. South Norway.

—"Papier-Journalen, May 31, 1921.

Surplus Stocks of Newsprint in Norway.

Recent reports disclose the fact that there is an active demand for newsprint with the result that stocks are diminishing, but there is still a large supply and prices continue low. This circumstance and the impending general strike in Norway are checking operations by the mills. Newsprint makers are unwilling to commit themselves in view of these troubles.

—"Farmand, May 26, 1921.

Wood Pulp Production in Sweden.

Acording to the latest statistics published in "Svensk Pappers-Tidning," he output of chemical pulp from January to May was 8,732 tons of bleached sulphite and 119,557 tons of unbleached for shipment and 5,200 tons of bleached and 34,389 tons of unbleached for "private account," or 168,389 tons.

Normal production of the sulphite mills for this period is 270,000 tons. Deliveries in May were very small. Production of wet mechanical for the same period was 70,600 tons, as compared with the normal output of 110,000 tons.



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Saturday afternoon dailies are publishing issues as small as eight pages, the Saturday morning papers range only between 16 and 24 pages, while all during the week local papers show a marked decrease in the number of pages. This doubtless is the situation all through the States, and is nothing unusual for this time of the year when business is quiet and advertising, particularly by the large department stores, is down to a minimum.

Coupled with the drop in consumption of newsprint is an increase in production, made possible by a resumption of operations by practically all of those mills which this time last month were shut down because of the strike. This obviously makes for an easy market condition, and the offering of newsprint by German and Scandinavian producers at low prices tends to accentuate the weakness. Spot newsprint in standard rolls is reported selling at 4.75 cents per pound and less. The contract basis remains unchanged at 4.75 cents, but according to authoritative reports the spot situation is steadily becoming weaker, and it is said that firm bids at a good deal under the contract lever are being frequently accepted. Another reason for the softness of the spot market are reports to the effect that another sharp cut in prices to contract customers will be made on deliveries during the final quarter of the year. It is stated that the rate for the last quarter will be 4.25 cents a pound, or $85 per ton. If this proves to be correct it will establish an average for the full year of 5.25 cents a pound, or $105 a ton. These reports have their origin it is stated, from authoritative sources in Canada, and for this reason most members of the trade here are inclined to believe them more or less accurate. General opinion in publishing circles of New York has been for some months past that newsprint prices would gradually work downward until they reached 4 cents a pound, or close to that figure, and some have expressed the belief that prices would go as low as 3.50 cents before becoming fully stabilized. No one has looked for pre-war prices to return, but it has been felt by a great many consumers as well as members of the paper trade that newsprint would not hold up around 5 cents, and this undoubtedly accounts for the present policy of buyers in absorbing supplies very cautiously, mostly placing orders only for tonnage they know they will need with some relying more than usual on spot purchases to cover requirements.

The remainder of the paper market show no change of importance. There is no unusual activity existing in any corner of the trade. On the other hand, the prevailing dullness in many lines of paper is rather exceptional. Consumers exhibit a determination not to buy unless the need is imperative, and jobbers in turn are placing orders with mills only when having actual commitments to cover. Conditions at mill centres have not improved in point of activity. A large mojority of mills are running on short time schedule and some are adding to their stocks of finished paper even while operating on part time. Manufacturers in the Holyoke district have proposed a further reduction in wages of mill operatives, and have called a conference with union leaders to discuss the proposal during the next few days. This cut no doubt was prompted by the reduction put into effect by mills in the Kalamazoo district recently.

General opinion in the trade is that buying activity will expand before the end of August. There are many expectant of a return of good business toward the latter part of the coming month, it being felt that other manufacturing industries are reawakening and that the paper industry will shortly begin to share in the trade revival.

GROUND WOOD—No marked change has occurred in ground wood this week. The situation continues to be characterized by steadiness and there is unquestionably an upward tendency to prices. Continued dry and hot weather strengthens belief among those on the selling end of the trade that ground wood values are due for enhancement during the next few weeks, and although sellers are not as yet advancing quotations, they are becoming firmer and firmer in their demands for asked prices. Some of the foremost selling agents and producers in the country are refusing flatly to book orders involving ground wood for delivery further away than a month, owing to belief that within a month available stocks of mechanical pulp will be worth more money than today. Consumers appear to be quietly laying in supplies though it cannot be said that there is any concerted buying movement. Present transactions mostly concern small tonnage and cut no important figure in the market, though indications are that the average consumer is purchasing just a little more than he is now using.

Between $26 and $28 a ton at grinding mills is the range of quotations on prime ground wood for prompt shipment, with now and then a producer situated a far distance from the consuming point quoting a little less, down to $24 a ton having been mentioned. The delivered basis averages $35 to $36 a ton.

CHEMICAL PULP.—Sulphite of every grade is in slow demand and there is no feature to the market unless the easiness in prices, which has been a characteristic of the situation for quite some time, can be

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called a feature. Paper manufacturers are buying strictly in hand-to-mouth fashion, and aggregate business is scarcely sufficient to establish definite market prices on any kind of chemical pulp. Domestic bleached sulphite is reported in some quarters offered down to 3.50 cents per pound, whereas the leading producers of No. 1 bleached are said to be demanding 4.50 cents and higher. News grade sulphite is reported readily available at 2.50 cents, while No. 1 domestic unbleached sulphite is said to be offering freely at 2.75 cents or at a trifle better. Kraft has eased off another peg or two, and both domestic and foreign kraft is now reported available at 2.50 cents per pound and less. Pressure on the part of the European producers to market pulp in the United States is still an important factor in the easiness of prices, and naturally discourages consumers from buying other than supplies they immediately need.

RAGS.—No expansion of trade activity can be reported in papermaking rags. Current demand is of very limited proportions and the little buying being engaged in by consumers hardly serves to make a market. It is extremely difficult to ascertain what actual prices are. Dealers in most cases are at a loss what to ask for rags or to say what can be realized on stock and prices as they exist today are largely a matter of the individual view of the holder of the goods as to what he considers the market to be. This much can be said, and that is that most mill buyers are succeeding in getting the rags wanted at close to their own prices, which means of course they are obtaining concessions. To do this, however, it is necessary that they shop about the market as a good many dealers are unwilling to sell at ruling prices in expectation that better values will be obtainable later on when demand assumes something approaching normal. Offerings by dealers are reported of new No. 1 white cuttings at 9 cents a pound at shipping points, of new unbleached muslins at 7.75 cents, of white lawn cuttings at 8 cents, of blue overall cuttings at 5.50 cents, of washables at 3.75 cents, of No. 1 old repacked whites at 4.75 cents, of repacked old thirds and blues at 1.60 cents, and of No. 1 roofing rags at 75 to 80 cents a hundred pounds.

PAPER STOCK.—Soft white shavings and white blank news cuttings and possibly one or two other grades of old paper hold fairly steady in price, due as much to the light accumulations in packers' hands as to present demand from consumers, but the general situation is paper stock is quiet and easy. Evidently the cardinal reason that prices on low grades do not go further downward is because prices already are at levels where they are afforded little on no opportunity to undergo additional recession. No. 1 mixed paper, for example, holds at around 22½ cents per hundred pounds, not because demand from mills is ample to sustain the market but because this price leaves packers virtually no profit in collecting and grading and baling the stock. No. 1 soft white shavings are quoted at an average of 2.15 cents a pound New York, and white news cuttings at about 1.40 cents.

OLD ROPE AND BAGGING.—One thing can be said in favor of old rope; this kind of papermaking material is holding its own in price under a fairly steady call from consuming quarters. Manila rope in No. 1 condition is bringing around 4 cents per pound at shipping points, with reports heard of sales in some cases at slightly higher than this price, and the market appears to be well sold up on this commodity.

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The House of Harrisons & Crosfield dates from 1844 when Daniel Harrison, Smith Harrison and Joseph Crosfield formed a partnership in the Tea business in Liverpool, Daniel Harrison having previously been in partnership with Octavius Winterhouse until 1842.

Without attaching undue importance to the date of a joint venture which had probably come about through personal relations uninfluenced by external events, it is worth while remarking on the legislative and economic landmarks of the early forties if only to emphasize the great changes in the conduct of trade which were then taking place. The foundation of the house thus coincided with a period of wide legislative reforms, among the chief of which were the liberation of trade from tariffs and shipping restrictions; an era highly favorable to commercial enterprise and in particular to the development of business with the Far East.

After 1900, however, Tea ceased to be the firm's sole interest. The days of plantation rubber had come and Harrisons & Crosfield were foremost in its development. They had established a branch in Colombo in 1895 under the name of Crosfield, Lampard & Co., of which the present Chairman, Mr. George Croll, was the first Manager. The development of the business overseas, together with the growth of the Rubber Industry and the responsibilities which it entailed, had made it essential to ensure greater continuity than a partnership could afford, and accordingly in May, 1908, the business was registered as a Limited Company with a capital of £307,500.

The progress made by the Company since its foundation in 1908 cannot be described in detail. As in the case of most growing concerns it has taken the form of a constant enlargement of the sphere of operations, with the devolution here and there of specialized branches of the business which can best be carried on by separate companies.

The interhouse trading by which each concern is in the position of being able to supply direct had led to an expanding business, especially in the Far East and Australasia, in Paper, Machinery, Hardware, Chemicals, Woodenware, Soft Goods, Groceries, quite apart from the raw materials which each centre requires. This policy of interchange of products of the various countries in which Harrisons & Crosfield Ltd. are represented, places their customers throughout the world in a position to secure their requirements of raw materials or manufactured goods in the best market.

The Export Department of the Montreal Branch has been active in fostering trade in Canadian manufactured articles with Australia, New Zealand and Far Eastern Countries. Special attention has been paid to those articles which Canada is economically suited to export, the intention being to develop only permanent foreign business. Considerable quantities of high grade bonds, ledgers, writing papers, also wrappings and bags, etc., have been marketed in overseas countries and there is every reason to expect a steady trade will be kept up.

An important feature of the Company's activities in recent years has been the development of Estate work and general trading in the Dutch East Indies, Japan, Borneo, and elsewhere.

The issued share capital of the Company has been increased several times since 1908, and now amounts to £1,844,986.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., August 11th, 1921. No. 32

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager. Toronto Office, 1402-3 C.P.R. Building. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager. 528 Winch Building. Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

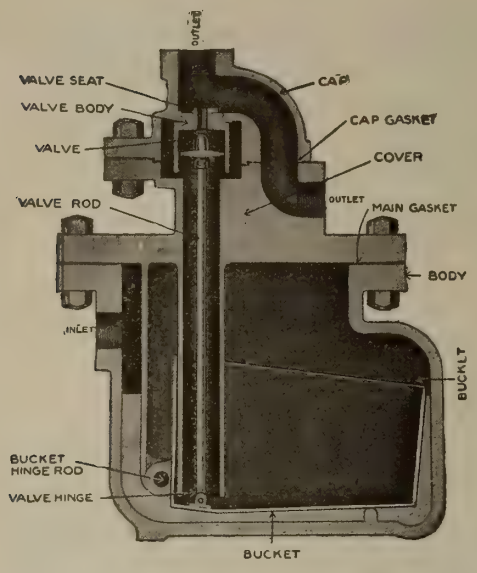
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EDITORIAL

CHRONIC OPTIMISM.

Early this week the annual report of one of Canada's largest pulp and paper companies, in fact, one of the most important newsprint producers on the continent was issued. The statement covers the year ending with June 30th and the figures are distinctly encouraging. The earnings and the profits are shown to be a very good percentage based on the investment in the properties and will no doubt lead some people, who would like to cast reflections on the industry, to say that these profits are exorbitant. Such critics will fail to realize that the year referred to included the period of peak prices and that this mill, like most others, have on hand considerable stocks or raw materials bought at high prices which will have to be converted into paper that can now be sold only at a very considerable reduction from the prices that ruled during the past year. It is true that a number of items of manufacturing cost have been materially reduced but such reductions have not kept pace with decreases in selling price. It will be remembered that when costs of materials began to climb, the newspint industry was prevented by law from stepping up its price in proportion and it was absolutely necessary for the stability of the industry that, during the period of unexampled business prosperity, prices should be charged which would enable the manufacturers to write off their high cost inventories so as to pass through the period of present business depression and enter the period of coming business activity at the reduced prices for all commodities which must rule during the next two or three years.

There is a great deal of promise for the future of the industry in the satisfactory margins that have been carried forward during the past year by the great majority of the Canadian Pulp and Paper Industry. Here and there a concern has not been particularly fortunate but so far there have been but one or two serious misfortunes.

The editor admits being a confirmed and chronic optimist on the future of the Canadian Pulp and Paper Industry, based on the firm belief that the managers of our mills are men of exceptional business capacity and on the conviction that in no industry is there a better general feeling of confidence and good will between the employer and the employee, a condition which is of the utmost importance to the stability of the industry and the earning power not only of the investor but also of the people employed. We have heard more than one manufacturer say that he believed in paying his men good wages and when his figures were compared with others employing the same class of labor it could be seen he meant what he said. On the other hand, in spite of difficulties that have not quite settled down between the union leaders and some paper manufacturers, we have no doubt but that the majority of paper makers realize the necessity, as well as the justice, of maintaining wages in proportion to the selling price of the product. It is unfortunate of course, that the selling price can not be always fixed in proportion to wages but, because the consumer has something to say in the matter, the price that he is willing to pay is what determines whether the goods can be sold and surely if goods cannot be sold wages cannot be paid. Fortunately, most consumers of paper are reasonable people and are willing to pay a price which permits the payment of reasonable wages.

The period is upon us when manufacturers will have to be satisfied with a smaller percentage of profit and with proper organization of their plants and the good will of their employees to co-operate in producing the maximum amount of saleable goods the turnover will be sufficiently large to make operation worth while. It must be remembered too, that the same argument which moves the employee to accept a lower wage should console the management and the investor in accepting a smaller return, namely, the dollar that he gets is worth more than it was a year ago.

Another factor which will figure largely during the next couple of years is the general improvement in plants that has been carried out by most of our mills recently. This has taken two general lines, one is the introduction of new machinery and the over-hauling and repair of the old and the second is the introduction of scientific investigation of problems and technical control of operations. This combination, if carried to its logical conclusion, with the proper encouragement from the management and support from the mill man, will shortly result in an economy and efficiency of operation that will enable the Canadian industry to compete with any pulp and paper producers in the world.

MORE FOREST FIRES.

For the last week end reports have come in from widely scattered areas that forest fires had again broken out and, in a number of cases, considerable damage has been done. In one case the statement was made that since it was only second growth that was burned over the loss was negligible. That is a direct contradiction to a statement we made last week that there is no such thing as a fire without a loss. It is just as such a loss

for any trees, even if only one or two years old, yes, even if they are not yet trees at all but just seeds lying in the leaf mould waiting to be germinated by the warmth of the sun, to be destroyed by fire as it is a loss to the farmer if hail cuts down his grain crop before it is ready to harvest or to the fruit grower if the frost kills his blossoms or the wind blows them off. In either case the actual crop that he intended to harvest is not destroyed because it has not yet matured but the possibility of a crop has been swept away and this is just as true of the destruction of young forest trees and seeds as it is of the grain or the fruit.

Mention is made on another page of the fine work that is being done in Ontario by forest rangers in preventing fires from spreading. Probably even more important work has been done by them in preventing fires from starting. The granting or the withholding of permits for the burning of slash and the caution which comes with the knowledge of supervision and the fear of prosecution for breaking the law with respect to setting forest fires, have been wholesome influences in protecting our great natural resource. Greater stringency however must be exercised in the enforcement of the law and greater severity in sentences imposed before our forests are safe.

Communications from Provincial foresters assure us that newspaper reports are often very much exaggerated as to the extent of forest fires, and doubtless they are. The fact remains however, that the losses from forest fires are enormously greater than there is any reason for and the causes of the loss in nine cases out of ten are directly traceable to human carelessness. The protection of our forest is a primary duty of every citizen. They are not only necessary for the continuance of some of our basic industries which employ and support thousands of Canadian citizens but they are also great protectors of our water powers and are directly of enormous benefit to the agricultural industries of the Dominion.

COBWEBS.

We just read of a man whose jaws wobbled when he talked. The trouble was that he had found a set of false teeth and the fit was not all that was to be desired, consequently he had difficulty in manipulating them. He was hopeful, however, even confident, that in time he would have them filed down to a good fit. Business seems to be in a somewhat similar condition at the present time. The current widespread depression is really a false or unnatural condition. The world has a mouthful of false teeth, so to speak, and is endeavoring to file them down to a fit. The process is tedious and the general expression is a bit wobbly but things are coming out all right and a little patience together with a good deal of courage and faith will result in a satisfactory fit.

The Association of Wood Using Industries in the United States is endeavoring to solve the problems involved in the standardization of sawn lumber. It is stated that one branch alone of the wood using industries wastes each year 600,000,000 feet of wood that could be cut into sizes required by other branches. The efforts of the association are directed along educational lines and their work is sure to result in great benefit, not only to the lumber industry but to the wood using industries as well.

The visiting members of the S. C. I. have a right to expect a cordial welcome and an interesting experience in Canada. The first requisite is a good attendance at the meetings, which begin August 29 in Montreal. No one feels at home in an empty house. A special feature of the programme is a whole session, the morning of August 30, to be devoted to the Pulp and Paper Industry. Our readers will find it distinctly worth their while to be there.

On another page will be found a picture of the safety shield which is offered for competition among the pulp and paper mills of Ontario.

Now is the time eo getbusy for business.

We are all glad to have Mr. Beck back.

CANADA NOT IN IT.

We received a few days ago through the courtesy of our contemporary "Papyrus", a volume of 996 pages entitled Papyrus Annuaire de toutes les industries du papier. This is the most extensive directory that we have ever seen of publishers, merchants, agents, paper manufacturers, etc., and the publishers of this volume are to be congratulated on the extent of the ground covered. One finds information in considerable detail for Great Britain, Belgium, Switzerland and the United States, besides, of course, the very intimate description and directory of the industry and the associated industries in France, but we fail to find any mention whatever of Canada. We understand that the prominent Canadian papermaker who recently saw the publishers of this directory was assured that Canada would not be overlooked in the future. In spite of this rather serious omission, the directory is a very valuable one and should prove exceedingly useful to anyone having any idea of doing business with consumers of paper in the countries referred to.

SAFETY FIRST DINNER.

The members of the Safety First Department of the Belgian Industrial Company, Limited, were the hosts to about twenty Laurentide employees at a dinner at the Cascade Inn, Shawinigan Falls, a week ago Saturday night. The dinner was the result of a competition between the two paper mill departments to determine which would have the lower record of injuries and the Laurentide department won the wager. A pleasant time was had by all who attended and closer co-operation between the departments of the two concerns is the result.

The way to feel like doing our duty is to do our duty whether we feel like it or not.

Forestry in Britain

By EDWARD BECK, Publicity Dept., Canadian Pulp and Paper Association.

Among the possible causes contributing to the unprecedented period of drought through which the British Isles are pasing is included that of the destruction of the forests which has resulted from the War.

"May it not be," asks a writer in the Daily Mail, "That we owe the drought from which we are suffering to the fact that most of our trees worth calling trees have been felled. It seems to be an established fact that local afforestation increases the rainfall of the district, and the denudation of the soil, owing to the destruction of forests, in India, is a fact equally well-established. Trees evaporate more water than even seas and lakes."

Be that as it may, after centuries of alternate care and neglect, ranging from fierce enactments by the Normans to preserve the forests as hunting places for royalty, down to the eighteenth century boom of forestry to provide timber for ship building, and its subsequent deflation when wooden ships became obsolete —Great Britain was never so deeply concerned nor so active as just now in forest promotion. The government is endeavouring by every possible means to restore the United Kingdom as nearly as possible to a self-suporting forestry basis. That this will take many years to accomplish if, indeed, it can be brought about at all, is apparently no deterrent. Britons are accustomed to a long look ahead. And, in any event, an active start has already been made to bring about the desired result.

The Forestry Commission of Great Britain, of which Lord Lovat is the head, and which was brought into being by an Act of Parliament passed in 1919, as a direct result of the enormous inroads made into Britain's standing timber during the war, has made much headway during its brief existence and now has an extensive forestry program well organized.

A preliminary grant of £3,500,000 was voted by Parliament for the purposes of the Commission. This sum is intended to cover a ten year period. The program to which it is to be applied includes the afforestation of of 150,000 acres of new land by direct action of the State; assistance to local authorities and private owners for the afforestation or re-afforestation of 110,000 additional acres; the purchase and reconstruction of hardwood areas; the education of forest officers, landowners and land agents, working foresters, and foremen; research and experiment, and the encouragement of forest industries.

The Commission has added to this program the work of obtaining a survey of the entire woodlands resources of Great Britain in which they have enlisted the assistance of private organizations and individuals and which is to be completed within three years. This survey which is estimated to cost £80,000 is expected to give essential facts and figures with a sufficient degree of accuracy as to enable Parliament to come to a decision as to the country's permanent forest policy, when, it is anticipated, a still more generous financial arrangement will be made for carrying on the work.

The Commissioners favor the continuance of the plan already adopted by Parliament in creating a "block" ten-year period for the purpose of financing the state forests. They are of the opinion, however, that the difficulties already encountered, and inherent to beginning work on a ten-year block grant, due to the slender basis on which to estimate and the unforseeable changes in prices and values, as well as the uncertainty as to the government's policy at the end of the period, make some change of the arrangement desirable.

"Forestry," they assert with truth, is obviously not a subject which can be taken up or dropped at will without serious loss of efficiency.

They suggest that, while adhering to the 10 year block grant system, Parliament should also systematically review progress at the middle of each recurring period and simultaneously make provision for a further 10-year program, which, in turn, would be reviewed and extended after an interval of five years.

The suggestion will appeal to all practical foresters wherever a state forestry policy is under consideration. Much of the lack of success of forestry policies and the cause of many of the difficulties encountered are traceable to haphazard or short-period legislation and to the failure at the outset to devise a permanent policy that will ensure continuity of effort and give to the practical foresters sufficient scope to make their efforts effective.

Pending the adoption of some such permanent policy by Parliament the British Forestry Commission is acquiring land by lease and purchase as fast as suitable areas are obtainable and bringing it under forest cultivation, as well as carrying on other sections of their program. The lands thus acquired are forest areas which were partly or wholly denuded to supply Britain with wood during the war, or grazing and other non-agricultural lands more suited for tree-growing than for other purposes.

Prior to the war the United Kingdom possessed about 3,000,000 acres of woodlands which yielded every year some 45,000,000 cubic feet of timber. It imported wood and wood products, including woodpulp to an amount equivalent to 550,000,000 cubic feet of standing timber. These imports, an inquiry disclosed, increased fivefold between 1850 and 1910. Consumption rose during the same period from 3½ to 11 cubic feet per capita of population. The ration of home to foreign timber had declined and in 1914 amounted to barely 10 per cent of the supply. The value of imported timber had risen steadily for the thirty years prior to the war while the quality had as steadily deteriorated.

The average annual imports for the five years preceding the war 1909-13, inclusive, amounted to 10,204,000 loads of wood and timber and 859,000 tons of woodpulp. In 1914 wood and timber imports declined by about 20 per cent., but the quality of woodpulp increased to 990,000 tons and did not decline below the pre-war level until 1916. Apart from this the reduction of imports which began in 1914 was continued at a slightly less rate in 1915, and at an increasing rate in 1916 and 1917, to reach bottom in 1918. In 1918 the total imports of wood and timber amounted to 2,479,000 loads or roughly 25 per cent of the prewar figure. It was in order to make up as much as possible of the heavy deficit in 1916-18 that the home woods were ex-

ploited to the utmost. On the other hand the recovery in imports had been even more rapid than the decline. Wood and timber were imported to the amount of 6,866,000 loads in 1919 and 7,418,000 in 1920. Woodpulp imports exceeded the pre war level in 1919 and increased in 1920 to 1,094,000 tons, which is the maximum yet recorded.

As regards prices, the reports show that there was a progressive rise in values as imports declined. The average price of all imports of unmanufactured timber during 1909-13 was £2.77 per load, in 1916, £6.4 per load and in 1918, £11.8 per load. The price fell to £10.5 in 1919, to rise to £11.08 in 1920. The rise in the price of pulpwood was from £4.7 per ton in 1909-13 to £10.7 per ton in 1916 and £30.4 in 1918. The total value of the wood imports in 1920, inclusive of wood manufactures, was £120,326,000 against £34,314,000 the average of the five years 1909-13.

"That the state of things was unsatisfactory in time of peace was generally admitted" the commission declares in reviewing its first year's operations. "It required but one year of war to show how critical the position was in a time of national emergency.

"In 1913 the quantities of timber and grain imported were about equal and headed the list of imports. They absorbed between them a quarter of the total shipping which entered British ports from overseas. In 1916 the people were hungry, yet, despite the most strenuous efforts to set more ships free from imported grain, it was found imposible to reduce by even one per cent the proportion of shipping required to carry the timber essential for operations of war abroad and at home. Napoleon's maxim that an army marches on its belly had to be brought up to date. The great war showed that the belly can only move on wood and iron of which wood is required in far greater bulk. Not till arrangements had been made for supplying the requirements of the army from the French forests and the home demand by ruthless felling of the old and young woods in the United Kingdom could tonnage be released for further imports of food."

In 1915 a committee was appointed to expedite home fellings and it soon became evident that owing to the depletion of home resources a national forest policy based on considerations of public safety was inevitable after the war. It was this realization that induced the step which subsequently led to the present efforts to restore permanent and adequate forests in Great Britain.

This policy, based on national insurance has, the Commission points out, as cogent arguments in its favor in time of peace as in time of war.

"The timber consumed in Great Britain and by the British Army in France between the years 1915-1920" says the Commission, "cost the country at least £190,000,000 more than a similar amount of wood would have cost at 1909-13 prices. In the year 1920 the Nation imported approximately one-tenth less wood and pulp than in 1914 and paid over £80,000,000 more for their purchase.

"There is no reason to suppose" it is added, "that the average annual demands for timber for house construction, delayed repairs and industrial developments will be less in the next decade than they were during the five years immediately preceding the war. If this is the case, and the price of timber does not fall much below a figure midway between the 1913 and 1920 prices, we shall have to pay for the whole of the period 1915-1920 anything between £400,000,000 and £600,000,000 more for our timber than we should have had to pay for a similar amount at 1909-13 prices.

"It is not argued that if the planting program now adopted had been completed before the war the price of timber would not have risen. It can, however, be definitely stated that had these additional woods been in existence they would have competed with Scandinavia and Finland and tended to keep prices of softwoods at a lower level."

Referring to the forest situation in Great Britain prior to 1919, the Commission sums up conditions as follows:—

"Those accustomed to the highly developed state of the Continent, with their regular succession of age classes and their ordered routine based on centuries of experience will have difficulty in realizing the conditions under which State forestry made its start in this country. Apart from the Crown woods the state forests in Great Britain in 1919 consisted of a few hundred acres of plantation recently acquired in Ireland.

"As a result of the absence of State forests there was no organized higher executive staff with British experience, no forest officer personnel, no body of foresters and foremen with State forest experience or customs, and, above all no forestry code. Surveys of plantable land were only beginning and little or no statistical information had been collected regarding privately owned woodlands. British forestry research was yet in its infancy. Admirable as has been the pioneer work it had seldom been directed to those particular points which were of importance to a forest authority initiating State Forestry "ab avo". It is true that experiments on a considerable scale had been undertaken by private individuals, but although in the mass they represented a body of information of real importance, the results had seldom been reduced to a form available for general application. In embarking on a policy of State forestry a start had therefore to be made, if not from the scratch, from a point very near it."

Taking these statements into account, it is interesting to discover through the first annual report of the Forest Commission just issued, that the Commission has made a more than satisfactory beginning. It is now in possession of 103,000 acres of land scattered throughout England, Ireland, Scotland and Wales of which 68,000 acres are classified as plantable. The area planted including that planted during the current season of 1920-21, covers 8,000 acres. Work is progressing by well-developed steps. The program contemplates an average annual expenditure of £400,000 to £420,000 a year; the acquisition of 260,000 acres of afforestation land by 1925 and the planting of 60,000 acres of the same; preparations for planting an additional 21,000 acres in 1926 and 24,000 acres in 1927. The Commission estimates that it will be obliged to purchase seed in 1926 sufficient to supply upwards of 70,000,000 seedlings for the planting season of 1929 as well as to acquire some 50,000 additional acres of land by that year.

The area planted in 1919-20 amounted to 1595 acres (since increased, as stated, to over 8,000 acres) of which 1474 acres were placed under coniferous plantation and 121 acres planted with broad leaved species. The number of plants used was 3,484,000, Scotch and Corsican pine accounted for 35 per cent of the plants while Norway and Sitka spruce provided 37 per cent. The Douglas fir, common to Western Canada, is highly

esteemed here for its fast growing quality and general sturdiness and is being used on an increasingly large scale. European and Japanese larch, oak, ash, beech and other tree varieties are also cultivated.

Production statistics induce the Commission to believe that land capable of producing the faster-growing conifers under optimum conditions gives the best financial returns even where the cost of acquiring the site and establishing the crop is relatively high. First class Douglas fir land capable of growing up to 160 cubic feet per acre per annum will, the Commission states, given a market for pit-props, pay back the cost of planting in the course of the first 25 years. On the other hand, the poorer classes of Scotch pine land, especially at high altitudes, however, cheaply acquired and planted, only begin to pay back the original outlay after 40 to 50 years and at the time of final felling make but a low return on the capital invested.

The returns from afforested ground vary widely, the Commission finds. In the examination of some 1,100 plots and sub-plots in different parts of Great Britain and Ireland, it has been shown that returns run from 160 cubic feet per acre per annum in the case of first class Douglas fir land down to 40 cubic feet or less per acre per annum for poor Scotch pine land. In afforesting hill grazings whether at present used for deer, sheep or common grazings, it is found that the land varies from that suitable for the faster growing conifers on the lower slopes to land on the upper slopes which will produce 40 cubic feet per acre per annum. Taking a return of only 60 cubic feet per annum as an average return on the whole area and allowing 30 cubic feet of grown timber to the ton, it is figured that about two tons per acre per annum will result. Taking the gross value of timber at from 6 pence to 10 pence per cubic foot, the gross annual return works out at something between £1 10s. and £2 10s. per acre.

The figure generally accepted by the Commission for employment in forest land is one man to every 100 acres during the planting stage, one man to every 50 acres in the productive stage, and one man to every 25 acres when forest industries have been established round the forests.

Where necessary the Commission providing housing for its forester and forest laborers.

In respect to private and corporately owned woodlands, which the Commission under the Act is also bound to assist, the policy adopted and in effect is that of offering asistance to landowners and corporate bodies, during the initial ten-year period in re-afforesting at least 50,000 acres of old woodland as well as in planting 60,000 acres of new lands, at an estimated cost to the Forestry Fund of £327,000 of which £137,000 is allotted to proceeds—sharing schemes between private individuals of corporate bodies and the state, and the remainder to the bestowal of grants and loans. The grants contemplate paying £2 per acre as an inducement to private owners to replant felled areas and to extend the area of their operations.

For educational work, the Commission contemplates an initial expenditure of £20,000 a year, it being expected that educational institutions participating in the grant will provide a similar amount on the pound for pound principle.

A personal visit paid to the Dean and Highmeadow forests and to the Tintern Woods, situated in Gloucestershire and Monmouthshire, and other State Forests found them in the hands of competent forest engineers who are making splendid progress in their efforts to bring these woodlands back into the highest degree of efficiency and economic returns. Practically no pulpwood is at present derived from the British forests, nor is it probable that such wood can be grown to commercial advantage in competition with Canada, Newfoundland, Scandinavia and Finland. At present the State forest yield wood for building purposes, pit props, telegraph poles and various industrial uses, and in some instances return a profit on their operations despite the numerous difficulties under which they temporarily labor.

A MARKET FOR PULP IN FRANCE.

The editor had the pleasure last week of a chat with that good friend of the paper industry Mr. S. J. B. Rolland, President of the Rolland Paper Co. Mr. Rolland with his wife and daughter, had just returned from and extensive trip through France, Belgium, Holland, the occupied area in Germany, and a stop in England. Mr. Rolland had not been in France since before the war and describes most vividly the situation there at the present time in contrast to other days. He says it is quite impossible however, to portray all of the conditions as one must really see to understand. Mr. Rolland spoke particularly of the courage and cheerfulness of the French peasants in the devastated areas who are again busily at work cultivating their fields and re-building the houses and towns that were completely destroyed

The paper industry in France is in a serious condition but not without hope of recovery. It is in the re-establishment of prosperous business conditions as respects the manufacture of paper that Mr. Rolland feels Canada has a particular interest as a source of woodpulp He feels that now is the time for Canada to send qualified representatives to establish themselves and Canadian pulp in the good graces of the French paper manufacturer. It is necessary for France to import a large proportion of the raw material for paper making and if aggressive selling measures are now undertaken, Canadian pulp mills should benefit by a good share of French business.

Mr. Rolland is not particularly sanguine of Canada's change to compete in Europe with local manufacturers of high grade papers. His opinion is based largely on the spirit of the people and their attitude towards work. Every day there is made to produce to the limit and with the exception of France and England, where the 8 hour day prevails, the rising and setting of the sun determine the length of a day's work. The great idea, particularly in Germany, is to turn raw material by means of manual labor and mechanical power, into saleable products which will bring in the money which must be secured. It will be difficult for other countries to compete with such an attitude and such a purpose unless, indeed, our own conception of work be radically changed.

PULP COMPANY SECURES BUILDING PERMIT.

The Three Rivers Pulp and Paper Co., through its representative, the chief engineer, Mr. J. J. O'Sullivan, took out last week at Three Rivers, a construction permit for the erection of their factory which will be 540 feet x 100 and 70 feet, 2 stories high. Construction will be steel and concrete.

SAFETY COMPETITION UNDER WAY.

One of the biggest factors in the welfare of those engaged in the Pulp and Paper Industry though many of them do not realize it, is the Ontario Pulp and Paper Makers' Association. For a number of years this organization has been, with increasing energy, holding itself to the great work for which it was established, namely, to improve the conditions for the promotion of health and the prevention of accidents under which the manufacture of pulp and paper is conducted. It is really a misfortune that other provinces do not have similar organizations or, in fact, that there is not a Dominion wide organization of this kind.

The advantages of safety work, like many other good



things, are often not fully realized, and certainly not fully utilized, unless they are continually brought to our attention. We even have to be invited to church and urged to go to school. Health is one of the cheapest as well as one of the most valuable benefits that we may enjoy and yet a moment's carelessness or lack of though will often wreck the happiness of a lifetime. To inspire and to develop habits of carefulness is one of the principal objects of the Safety Association. The executive all having been boys, realize the enthusiasm and influence of competition, and have happily hit on this means of encouraging safety work in the mills and they have further shown their appreciation of the helpful influence of team work and team loyalty. The result is a team competition among the mills of Ontario for a tangible price, another very sensible feature of the competition. The prize shown in the picture, consists of a silver shield mounted on wood taken from a timber of original Don Valley Paper Mill, probably the first mill to operate in Ontario, and on which are also mounted the official trade mark of the Canadian Pulp and Paper Association and a number of medallions on which will be inscribed the name of the winner for each year. The mils have been divided into two groups according to size and a shield is provided for each group, thus making the competition much fairer than if a big mill were competing a small one. The mill in each group with the lowest accident rating for the current year will have possession of the shield until it is won by another mill and will have for exhibits a beautiful banner that will always be displayed not only as a permanent record of achievement but an inspiration to continued effort.

EDWARDS INTERESTS TO START NEW COMPANY.

Ottawa, Aug. 8.—An interesting announcement, and particularly so in view of the present Riordon situation, is that the W. C. and G. C. Edwards interests are to embark on a new line of manufacture in connection with which an incorporated company capitalized at $1,500,000 will shortly be announced.

The name of the new company is to be the Edwards Pulp and Paper Company and it is understood that it will be empowered also to deal in the manufacture of lumber as well as pulp and pulp products. The present wholesale lumber business known as the W. E. Edwards Company which is conducted at Ottawa, will be continued and will be carried on independently of the new company.

Since the sale of the Edwards lumber interests at Rockland and Ottawa to the Riordon Company Limited, the Edwards interests have not been manufacturing lumber, but have been engaged in the wholesale distribution of it. Recently, it is reported, the Edwards interests purchased limits, and it is stated that it is the intention to erect a saw-mill and manufacture lumber. Information as to the erection of a pulp mill or the manufacture of paper or pulp products is lacking, and opinion is that while the interests may become an incorporated company for this purpose, it is not likely that they will embark in the new enterprise at once.—Press Despatch.

It will be recalled that about two years ago, notice was published, in the Pulp & Paper Magazine, of the incorporation of an Edwards organization as a pulp and paper company with a capitalization of $4,000,000. That was before the Riordon merger.

COMPARISON OF OLD AND NEW U.S. TARIFFS.

Paper, Except Standard News Print.

Printing Paper, not especially provided for, 1 cent a pound and 10 per cent; Underwood, 12 per cent.

Paper Board and Pulp Board, 10 per cent; Underwood, 5 per cent.

Tissue, 5 to 6 cents a pound and 15 per cent; Underwood, 30 per cent.

Writing Paper, etc., 3 cents a pound and 15 per cent.; Underwood 25 per cent.

Books of all kinds, Bound or Unbound, 20 per cent; Underwood 15 per cent.

Manufactures of Paper, 2 per cent; Underwood, 25 per cent.

A Unique Canadian Industry

By W. H. SHERRIFF.

During the past decade or two Canada has witnessed the rise and rapid growth of many new industries. By no means the least of these is the Kraft paper industry. Kraft, the meaning of which was practically unknown ten years ago has during the past few years become a household word in Canada. It is a German-Scandinavian or Swedish-German word which in English means "strong."

Kraft paper was first made at Munksjoe, in Sweden, by a Swede named Müntzing, who discovered what is known as the sulphate process of pulp making.

For many years the manufacture of this paper was confined to Swedish mills but it eventually reached Norway.

Originally this paper was imported into Canada in comparatively small quantities from Norway and Sweden but it is now made in Canada and has become one of the Dominion's leading industries, and Canadian mills are now able not only to produce sufficient for the requirements of the home market but also export a large portion of their output to British and Foreign markets whose requirements were previously supplied solely from Scandinavian sources. Kraft pulp and paper were first manufactured in Canada in the year 1908, and the honor for its introduction belongs to the Province of Quebec, the first Kraft mill being at East Angus.

Up to 1912 the production of Kraft in Canada was in its infancy but during that year the supply was greatly augmented by the opening of the well known mills of the Wayagamack Pulp and Paper Company at Three Rivers, P.Q., which are now the largest paper mills in the world, whose energies are devoted solely to the production of Kraft Pulp and Papers. Most other mills both in Canada and abroad produce several grades of paper but Wayagamack have from the first specialized in genuine Kraft.

At first this grade was looked upon simply as a wrapping paper and the word conveyed nothing to the lay mind, but today it serves not only as a wrapping paper of the highest quality but is used in the manufacture of many important articles.

The use of kraft in the manufacture of articles for which other raw materials were formerly used has increased to an extent that is nothing short of marvellous. For instance only a few years ago Kraft envelopes were a comparative novelty; today they are made and sold all over the world in hundreds of millions and give the same satisfaction as envelopes made from jute and cloth-lined papers costing three or four times the price.

The use of Kraft bags has also increased by leaps and bounds. They are used as containers for tea, coffee, sugar, fruits, candies, lime, cement, nails and hardware of every description. Even clothing is being made from this wonderful product of the Canadian forests and it is being used largely in the manufacture of workmens' overalls which, strange as it may seem, are both fire and waterproof. Kraft paper waxed or oiled is now the recognized wrapper for all food stuffs of a greasy nature and its use for this purpose increases daily.

Marketing bags, matting, wall papers, window blinds, awnings, chair seat coverings are other articles which are daily being made from this versatile product. Twines too are being manufactured from Kraft and even tents are being produced from this paper which has been found an excellent substitute for canvas owing to its ability to withstand rain. Most of these articles are made from strands or threads which have previously been spun or twisted from long strips of the paper about two inches in width. When the paper has been twisted it is so strong that it is impossible to tear it.

When this process has been completed the threads are similar to canvas. The material thus produced is then woven, the result being an attractive looking material used in the manufacture of many of the articles above mentioned. At an early stage during the war, Kraft became a necessity. It was used in the manufacture of explosives and many tons of Wayagamack Kraft were used by various munitions Boards in Canada and the United Kingdom in the preparation of rifle cartridges. A small wad of the paper was enclosed within the thin outer covering of nickle and took the place of lead. Millions of these bullets were fired at the Germans during the later stages of the war and some months elapsed before it was discovered that they were different from other bullets. Hundreds of thousands of sand bags also were made from Wayagamack Kraft for use by the British and Allied armies, these were used at the various battle fronts and also in England during air raids to protect historic buildings from damage by enemy aircraft. Thus Wayagamack may be said to have done "its bit", unconsciously perhaps, in assisting to win the war and helping "to make the world safe for democracy." The sand bags are made from the material previously woven from Kraft yarn and thus the necessary strength required to hold their contents and withstand adverse weather conditions is obtained. They can be produced at a much lower cost than jute sacks and are much more attractive in appearance, although I do not suppose the question of appearance was a matter of supreme importance to the troops in the field. But the latest and most ambitious use to which Kraft has been put is in the manufacture of what is called a corn or cereal cover. This unique article was invented by a gentleman farmer in the South of England and is used to cover wheat stooks and so protect them from the weather. The English climate is different from the Canadian; here the sun shines for weeks on and especially during the harvesting season and consequently wheat can be cut, threshed and stored before inclement weather is likely to set in.

Weather conditions in the old country are different, there is always an element of uncertainty as the farmer goes forth to gather in his crops. The sun may be shining brightly as he sets out but before his job is half finished the rain may begin to descend and it may continue for hours or perhaps days. Under such conditions it can easily be seen that the farmer and the nation stand to lose from damp and mildew, a considerable amount of what under more advantageous conditions would be a valuable crop. To obviate this the corn cover was invented. It is made from a strong sheet of Wayagamack Kraft in the shape of a miniature roof capable of covering ten or a dozen sheaves-stooks. Their adjustment is simple. The cover is placed over the stooks and fixed by two farm hands in the following manner. Two lengths of cord, also made from Kraft, are fastened to each cover, after placing the cover in position each worker threads a long needle and passes it through the stook and so on till the end of the stook is reached. When this is completed the grain

may be left standing in the field indefinitely, regardless of weather conditions. The paper not only protects the corn from falling rain but also absorbs any moisture that rises from the ground and consequently the loss of valuable grain by adverse weather conditions is reduced to a minimum..

There would appear to be no limit to the uses to which this remarkable product can be put, as the years roll on we shall perhaps have boots and shoes of paper and even paper houses, for even today the paper industry of Canada is in its early youth.

[The above article appeared, substantially in its present form, in the Toronto Globe of 6th July, 1921].

ELONGATION AND SHRINKAGE OF PAPER.

By A. Vander Stichel.

(Translated for the Pulp & Paper Magazine from La Papeterie, **42**, 270, March 25, 1920, by A.P.-C.)

For the manufacture of watermarked paper it is very useful to know the changes that take place in the sheet in process of formation. Such data are required for determining the proper spacing of the letters or designs on the dandy roll and also the diameter of the latter. It may be mentioned, by the way, that the clearest watermarks are obtained with a wet and relatively short stuff.

In the case of machine made paper the sheet behaves in an entirely different manner than in hand made: in the cross-direction there is a shrinkage, while in the machine-direction there is an elongation due to the tension to which the sheet is subjected. When the paper is under too great a tension, it loses strength and becomes weaker than hand made paper which is subjected to no tension.

A wire under normal tension stretches about 5 mm. per running meter. For our test we used a No. 70 wire, 14.82 m. long, so that during the test its actual length was

$$\frac{100.5 \times 14.82}{100} = 14.90 \text{ m.}$$

This figure was verified by measuring the wire while the machine was stopped. The width of the machine was 1.655 m.

The test was run on a printing paper weighing 60 g. per sq. m., made of chemical woodpulp and containing 33 per cent. loading. On measuring the finished sheet at the winder the length for one complete journey of the wire was found to be 16.10 m. and the untrimmed width 1.565 m.

This corresponds to an elongation of

$$\frac{16.10 - 14.90}{14.90} = 8\ \%$$

and to a shrinkage of

$$\frac{1.655 - 1.565}{1.655} = 5.44\ \%$$

These results are not applicable to all papers as they may vary considerably according to the nature and treatment of the furnish, the amount of loading, the thickness of the sheet, and especially the tension at the presses and driers.

A solution of the Riordon financial problem is expected this week as a result of the conference that have been going on during the past fortnight.

SPANISH RIVER EARNINGS UP.

Net earnings of the Spanish River Pulp & Paper Mills, Ltd, for the year ending June 30, 1921, amounted to $4,836,000, against $3,915,000 a year ago. After allowing $628,000 reserve for depreciation and $744.000 interest on funded debts, and other loans, the net surplus for the year stands at $3,463,000, compared with $2,552,000 for the previous year. Of this, $500,000 was appropriated for contingencies and Government taxes, leaving $2,963,000, to which is added the balance of the profit and loss account as at June 30, 1920, of $1,060,000, making the total of the income account $4,023,000. This sum was appropriated as follows: Dividends at 7 per cent. per annum on preferred stock, $603,000; dividends at the same rate on the common stock, $629,000; proportion of dividend paid to bondholders, $137,000; bond sinking to be carried forward $2,349,796.

This showing is highly pleasing because of the losses occasioned by a seven week's strike and the consequent shut down of the mills for about the same period prior to the end of June.

A further feature of the favorable position of this leader among the pulp and paper producers is the fact that the inventories have been written down to a figure representing present values and this is of particular interest to the company's stockholders in view of the wide-spread liquidation of substantial proportions that has taken place in inventories of all industries. In this connection it is pointed out in the report that shareholders may feel assured that the liquid assets have not been exaggerated in any way and that the large balance over current liabilities is not overstated.

A considerable amount, $3,321,465, has been added to the property account, representing capital expenditure to bring the mills into a producing capacity of newsprint alone amounting to 650 tons per day. It is understood that this amount includes the expenditure on the new machine at the Sturgeon Falls mills, which is now operating satisfactorily, although it was only started up a week ago. The development work at Smoky Falls, on the Sturgeon River, whereby the company obtains additional electrical power for the electric grinders at Sturgeon Falls mills, is also rapidly nearing completion and much of the cost has been included in the property account above referred to. It is interesting to note that notwithstanding the very large amount which has been expended on property account during the past year and for several years previous, amounting since 1917 to $8,500,000, the bonded indebtedness of the company is increased by less than $1,500,000 since that date.

The reserve shown in the balance sheet amount to over $5,000,000 without taking into account the balance at credit of profit and loss account at June 30, 1921, which is $2,349,000, after payments of dividends to all stockholders.

President George H. Mead, in his statement to the shareholders, points out that the operations of the compjany for the part twelve month, although carried on under conditions of exceptional difficulty, have been very satisfactory. From May 11 until June 30, the mills of the company as well as those of many other newsprint companies, were closed, pending the adjustment of a controversy with employees regarding the rates of wages. An arbitration agreement having been reached, the mills were re-started on July 4, and have since been in full operation.

WHY WE HAVE A COST SYSTEM.

By S. B. COPELAND, Vice-Pres. and Rest. Mgr.,
Eastern Mfg. Co., Bangor, Me.

In the management of an industry, such as that of the manufacture of fine paper, where the product goes through so many processes in its preparation and where there are many grades and varieties of product, we find a Cost Department not only a help toward intelligent management but an essential. Without the information which this department produces, long continued successful operation would be a matter of good luck rather than of judgment.

For determination of sales policies and making decisions upon manufacturing problems, the information contained in the following reports compiled by our Cost Dept., or based on statistics which are compiled there, are found invaluable.

A. Period Statement of Income, Assets and Liabilities.

As the records of the Cost Dept. are tied in the Commercial Books of the Company, statements of Gross Sales, Cost of Sales, and Net Income, and of Assets and Liabilities—which may be relied on—are gotten out for every four week period. Without controlled Cost Records, these figures cannot be safely used.

B. Estimated Costs of Paper, and Sales Reports.

Based on detailed records of manufacture and costs of materials and labor, estimates of costs of manufacturing the different grades, sizes and finishes of our product are turned over to the Sales Department and made use of in determining the prices should be obtained therefor.

Also, reports are gotten out showing for every four weeks our sales and the loss or gain from sales according to grades and finishes, by customers and by territories. These reports show which grades and finishes have proven profitable and should be pushed; the result of the business done with each of our customers period after period; and the general areas in which our sales are expanding or contracting.

C. Control of Manufacture.

For every four week period the cost of operating the Mill as a whole, and each department in it, in comparison with previous periods is reported to the Mill Superintendent and to other executives. These reports are made in detail so that fluctuation in costs of operation and the cause may be quickly ascertained. Costs of manufacture of steam and electric power are also reported in detailed comparative form so that these costs may be maintained as low as possible.

Performance of labor is shown up departmentally by comparative reports of the time taken for the different operations and standard times.

Efficiency of operation or the opposite is also shown up by weekly reports of Shrinkage and Broke, and by records of Broke made by grades.

Wastage may be detected by means of our reports of materials used showing the record of each period in comparison with previous periods.

We find reports such as outlined necessary for controlling all Mill Expense and maintaining efficiency and for preventing waste and loss of material.

D. Control of Inventories and Purchase of Materials.

Period reports are prepared to show the quantity and value of each inventory of raw material, materials in process of manufacture and finished product. These reports of materials on hand and of materials used assist the Purchasing Dept. greatly in preventing the tying up of too much money in inventories, and at the same time in showing up materials which may be run out.

These reports are also of value in Research Work.

E. Control of Cost of Repairs and New Construction.

By means of our cost records we are able to obtain reports of all expenditures for new construction and for repairs in totals and by single jobs.

When repair costs in any department are high, these reports show why; if repair men take too much time for a repair job the foreman of the department charged for the work generally complains about the charge, if no one else does, and the steps are taken to prevent a recurrence; if our indirect costs of doing repair work increase this also shows, and the amount of money tied up in construction in process is continually brought to the attention of those concerned.

The reports described above show in part why we find a Cost System an essential in conducting our business.

The expense of obtaining this information in comparison with the losses that could readily occur because of not having this information we feel is negligible.

INTERESTING DISPLAY OF FIBRE PRODUCTS.

The Diamond State Fibre Company of Canada, Limited will be represented at the Canadian National exhibition to be held in Toronto during the two weeks beginning August 27th. The exhibit will be in the Industrial Building and will be of particular interest to manufacturers of every line of merchandise.

The different grades of raw material will be shown as well as the finished product in the shape of noiseless water-proof gears, machined parts for electrical use, receptacles, automotive parts, etc. There will also be exhibits of articles in which Diamond Fibre has been utilized for machined parts in the place of wood, metal, rubber and other substances.

Representatives of the Company will be at hand every day to thoroughly explain Diamond Fibre and its uses to anybody interested.

Out-of-town customers are cordially invited to make the Diamond Fibre Booth their headquarters while in Toronto.

AMERICAN CHEMICAL SOCIETY. FALL MEETING, CELLULOSE SECTION

The president and secretary of the American Chemical Society have authorized another meeting of the Cellulose Section in connection with the Fall meeting of the parent society in New York, September 6-10, 1921. Prof. Harold Hibbert has been reappointed chairman and Gustavus J. Esselen, Jr., secretary. This will be the fourth consecutive session devoted to cellulose and its derivatives, a symposium on the subject having been held in both St. Louis and Chicago and the first meeting of the Cellulose Section, as such, at Rochester last April. At this last meeting great interest was shown and there is no doubt that the Cellulose Section has made a place for itself in the activities of the American Chemical Society.

It is the plan this year to issue the preliminary program much earlier than on previous occasions and accordingly, those who plan to present papers before the Cellulose Section are urged to send the titles at once to the secretary of the section, 248 Boylston St., Boston, 17, Mass.

PULP AND PAPER NEWS

The large lumber mill at Great Salmon river, near St. John, New Brunswick, which belongs to the Pejepscot Pulp and Paper Company, of Bath, Maine, U.S.A., was closed down last Saturday, for the remainder of the season. This has thrown some 200 employees out of work.

The compositors' strike in Toronto seems as far as ever from any approach to a settlement. But there seem some evidences of an increased acerbity being imported into the conflict. The Rev. E. S. Thomas, a local minister, has written a long letter to one of the Toronto papers in which he sternly deprecates the methods adopted by the employing printers, and hints that the ban on shops conceding the forty-four hour week may be a matter for the intervention of the Crown Attorney. Last week, too, Mr. James Simpson, the well-known Socialist, who is espousing the cause of the striking printers with great ardor, tried to get the Toronto Trades and Labor Council to pass a motion condemnatoy of Magistate Ellis, of this city, relative to certain expressions of the magistrate in question on the occasion of the trial of a compositor charged with stealing. He also wanted the Council to bring the affair of the magistrate to the attention of the Attorney General, claiming that his attitude was prejudicial to the interests of the striking printers at the present time. However, when Mr. Simpson had finished his remarks, it was found that the exit of a number of members had left the meeting without a quorum. This leaving before the motion could be put looks as though all the members of the Toronto Trades and Labor Council have not the cause of the striking compositors as closely at heart as Mr. Simpson, or else that they do not share his view as to the magistrate's attitude having been detrimental to their interests. One remembers, too, that when, a few weeks ago, an appeal from the Toronto Bookbinders' Union for financial aid was made to this same Toronto Trades and Labor Council, very pointed objection to granting such aid was made by several of the members, and the appeal was ultimately turned down on the ground that no funds for the purpose named were available.

It is worthy of mention, by the way, that at the meeting of the Toronto Trades and Labor Council last week, Mr. Simpson, the delegate responsible for the abortive motion mentioned above, stated that he was informed that the Toronto Transportation Commission was having its new street car tickets—for the street car service is to be taken over by the city from the Toronto Street Railway Company at the close of this month—printed in the Montreal Gazette office.

The present force of fire rangers in the employ of the Ontario Government numbers 1,000 and the territory over which their services range is no less than 100,000,000 acres in extent. The cost of this force to the Province is $3,000 a day. Owing largely to the vigilance of these rangers, two thirds of the forest fires of Ontario in the last four years did not spread beyond five acres, and, of these, half did not exceed one quarter of an acre. Nevertheless, appalling damage is done by fire to vast forest areas every year. Aircraft have lately done yeoman service in the Province in the way of speedy location, resulting in the early extinction of forest fires. The service they have rendered has not passed unnoticed at Ottawa, and it is to be hoped that both Federal and Provincial Governments will speedily realize, that as a means of fire protection, aircraft, for their special purposes, are quite unequalled, and that the extension and development of an air service for such purposes is a responsibility which they—and particularly the Provincial Government—may fairly be called on to undertake.

For some time, Hon. Howard Ferguson, the Conservative leader in the Ontario Legislature, has been making very vehement attacks on the Drury Government in connection with the much-discussed Backus deal. The other day, Premier Drury came back at him in what looks like a very effective manner. Mr. Ferguson had talked of Mr. Backus obtaining from the public domain at his own figure "a vast empire of forest wealth." Premier Drury, if his figure be correct, showed that Mr. Ferguson had greatly exaggerated the contents of this "vast empire." He went back also to the history of the former Government's dealings with Mr. Backus, and declared that Mr. Ferguson himself had asked dues of only $.40 and $.20 for spruce and poplar respectively, whereas the Drury Government is asking dues of $.80 and $.40. Mr. Drury indignantly repudiated the suggestion that he and his Government "would ally ourselves with a wealthy American who has brought on himself, justly or unjustly, a press campaign, when we have already, by fighting dishonest timber transactions, brought on ourselves the enmity of powerful interests."

Plans for the reopening of the Kaministiqua Pulp and Paper Company's mill, at Port Arthur, Ont., are, it is announced, following a directors' meeting last week, under consideration. The announcement states that the pulp market shows signs of improvement, that the Company owns two valuable timber licenses, and that, in view of the favorable situation of the mill, giving cheap transportation and easy access to a large supply of pulpwood, the prospects of the Company are considered bright. The plant at Port Arthur, it may be mentioned, which is at present closed down, was built to manufacture groundwood pulp, with a capacity of 7,000 tons a year. It was the intention to extend this into a pulp and paper mill, with a daily capacity of 250 tons of newsprint. But no sooner had the pulp plant got nicely started than the slump arrived. Organized in a sky-high market, and almost immediately confronted by a collapsing market, the Company defaulted in payment of the bond interest due on the 1st July.

The Provincial "Health Train" visited Grand'Mere this week and the staff received a cordial welcome. Another step, where great interest was shown was at Shawinigan Falls. The exhibits, lectures, and conferences will have a good effect on the sanitation and health in Quebec.

Mr. F. G. Warburton of the Harland Engineering Co. and Mr. W. Adamson, of Charles Walmsley & Co. are sailing Saturday from Quebec for England, after

an extensive, and, they say, enjoyable visit on this side. Mr. Norris is staying in Canada to complete some efficiency tests and other work in connection with the several Harland Patent Inter-lock paper machines drives now operating in Canada. A full report of this interesting work is promised in the near future.

Mr. J. O. Mason, of the Laurentide Co. has recently moved into his new house at Grand'Mere. There was a small fire in a pile of waste lumber during its construction. Last week the water heater in the basement blew up, but did little damage besides knocking down a few pictures and scaring the maids.

In a note which appeared in this column a couple of weeks ago, relative to the very interesting address recently delivered by Mr. C. V. Syrett before the Toronto Kiwanis Club, it is possible that a slightly erroneous idea was conveyed as to where he placed the emphasis (so to speak) of his address. It dealt with the growth of the paper industry in Canada and he laid great stress on the importance of Canada's forests and the keen interest that was now being given to reforestation. Then he traced the paper industry from its earliest stage up to the present giving statistics to show the growth. He then mentioned some of the more difficult lines of manufacture and dwelt on the demands for paper in specialty lines such as Paper Towels, Drinking Cups, Paper Cartons, that years ago would be considered impossible, and foolish. He wound up by giving a timely word for a more serious interest in Inter-Empire Trade.

Mr. A. E. Bryan, Canadian Trade Commissioner in Yokohama, reports that it is difficult at present to interest either foreign houses or Japanese in many Canadian lines. There appear to be good stocks of all imported materials on hand, and importers do not wish to place new business until present supplies have been almost exhausted. But many inquiries for Canadian lumber have been received. For the first few months of this year there have been heavy decreases noted in every raw material imported into Japan with the exception of lumber. There is also some market for wood-pulp, because, although there are big stocks of pulp in Japan at present, owing to the fact that Japanese mills are operating at only 80 per cent. capacity capacity, many firms look to Canada as the future source of supply and want to make connections with which they can do business just as soon as there is demand.

BEAUTIFULLY EXPRESSED.

It would be hard to find a more beautiful expression of the sacred feeling of bereavement than the words of the resolution passed by the American Paper and Pulp Association regarding the death of Angus Cameron, Winthrop Murray Crane, Elbert H. Geddes, Garrett P. Hynson, James C. Kerwin, H. C. Peters. Arthur F. Robertson, K. C. Sweet, J. P. Sill, George C. Sherman.

"The leaves from the tree of life, detached one by one, whirl with the early storms or in their full splendor drift slowly down in the autumn of life. Since we last gathered here, the unending procession has taken up many who were dear to some of us, who made our industry better for their contact with it, who have left the sweet fragrance of pleasant memories with their passing. Our sorrow is lessened with the knowledge of their greater happiness.

"As old friends gathered about the fire in the evening, we speak of them as part of our circle, absent on a long journey."

FILLING A PULP STONE CAVITY.

By W. A. MUNRO.

A pulp stone that has developed a cavity due to a sand pocket or other imperfection in the texture of the stone, a condition that was not apparent before the stone was placed in operation in the grinder room is a cause of considerable loss due to the expense not only of the labor cost but also of the lost time in removing this stone and replacing it with one that has the outward appearance of perfection. It has been known to happen that the new stone shortly after developed the bad traits of its predecessor.

An easy and permanent way has been found to fill these cavities and to make the stone's cutting surface as good as that of a perfect stone. This operation, the cost of which is negligible, saves the expense and time lost incidental to replacing the imperfect stone. This filling will last as long as the stone is of use, wearing down at the same rate as the rest of the stone.

The work of filling this cavity follows almost the same procedure a dentist does in filling a tooth. First the hole is cleaned out. The sand is dug out and the cavity is deepened and made wider. It should be at least four inches deep, an inch or two deeper will do no harm and will ensure a more permanent set to the filling. The hole should be made wider at the bottom than at the top and the sides corrugated to give the filling a better hold.

The composition of the filling is the most important part of the whole operation. The cement used should be new and of the best quality. This cement is mixed with an old pulp stone that has been broken up. About 33 per cent of this broken up stone should consist of small particles not larger than one eighth of an inch in diameter. These particles give the stone its cutting ability and if they are not used, the repaired spot will glaze over causing the stone to run very hot even when sharp and it will also diminish the production from the stone.

The cement and fine stone is mixed exactly half and half, and enough water added to make a thick paste. This is put in the cavity and tamped in. All cracks and hollows in the bottom of the stone should be well filled. This fine filling should be put in only up to the point where there will be no cutting action of the stone when the stone has been worn down. From this point the filling should consist of fifty per cent cement, twenty-five per cent of fine sand or binding particles, and twenty-five per cent of coarser sand or cutting particles. This should be pounded in with a soft wood stick not as solidly as the bottom filling but enough to insure the complete filling of all the upper parts of the cavity. The filling of the cavity should be about one-quarter of an inch higher than the face of the stone, so that when the filling sets, it will not shrink below the circumference of the stone.

The mixture should set twenty-four hours to become thoroughly hardened. The rough outer surface may be smoothed off by using a coarse diamond burr and cutting the projecting surface down gradually, as too violent action of the dressing burr may render the whole job of no value.

This filling will be darker than the original stone and harder. It wears down however at the same rate and takes a burr pattern well. The production is not lessened and no difference can be observed in the quality of the pulp produced.

Technical Section

REVIEW OF RECENT LITERATURE.

A-10. New Process of Drying China Clay. China Clay Review, xi, 23. It is averred that a system invented by a Norwegian for the drying of peat could be applied to a China clay. When this invention is finally perfected a great seving of labor ond operating costs may be effected.—A.C.

B-2. Choice of Species for Use in Plantations of Pulp and Paper Companies in the North. H. B. SHEPARD, **J. For.**, May 1921, p. 519. Discusses in detail the relative merits and disadvantages of the several pulpwood species for planting in the northeastern States. This discussion is adaptable also to large areas in eastern Canada. Of the four species of spruce, black, white, red and Norway, the first is eliminated because of its slow growth and poor adaptability to all except special sites. Red spruce is not considered desirable because of its slow growth, its susceptibility to the bud-worm, and because it does not admit of so economical seed collection. Norway spruce is an exotic species and little is known of its real possibilities on this continent. So far as its establishment and early growth in the plantation are concerned, it is inferior to white spruce. Its suitability for pulpwood alone has been thoroughly demonstrated in Europe, but little is known of its rate of growth on this continent, its resistance to enemies and the quality and origin of its seed supply. Some question has been raised with regard to the cooking properties of white spruce but the opinion is expressed that when this species forms the bulk of the pulpwood coming to any one mill, the cook will surely be adapted to it and satisfactory pulp will be produced. Thoroughly satisfactory results are, as a matter of fact, already being secured in the manufacture of sulphite pulp from white spruce at many plants. This species is regarded as the most satisfactory of the four for planting purposes.—C. L.

B-2. Growth and its Relation to Thinning. C. H. GUISE. **J. For.**, May, 1921, p. 546. Discusses briefly the permanent sample plot work of the forestry department of the New York State College of Agriculture at Cornwall University.—C.L.

B-2. Reforestation on Shifting Sand. A. H. RICHARDSON. **Can For. Mag.**, Dec., 1920, p. 566. Describes the planting work of the Ontario Forestry Branch.—C.L.

B-2. How Tree Seed is Gathered. A. H. RICHARDSON, **Can. For. Mag.**, Jan., 1921, p. 30.—C.L.

B-2. How France Sustains her Forests. Can. For. Mag., Feb., 1921, p. 105.—C.L.

B-2. Evergreen Growing on the Prairie. M. J. STEVENSON, **Can. For. Mag.**, March, 1921, p. 146.—C.L.

B-2. Great Results from Jack Pine Planting. M. J. STEVENSON,**Can. For. Mag.**, April, 1921, p. 212.—C.L.

B-2. Importing Tree Seeds. OTTO SCHIERBECK, **Can. For. Mag.**, April, 1921, p. 213. Advocates the home collection of tree seeds and the discontinuance of the former heavy importations of such seeds from Germany and other European countries. Much of the seed so imported in the past has not given satisfactory results.—C.L.

B-2. Second Growth Hardwoods in the Adirondacks. A. B. RECKNAGEL, **J. For.**, Feb., 1921, p. 129. Clear cutting in the hardwood type results in even-aged stands of beech, birch and maple, and in a more rapid growth in diameter, height and volume. Growth tables are presented which point to a productive possibility in our second growth hardwoods which is distinctly encouraging.—C.L.

B-2. Forest Planting in Southern Michigan. L. J. YOUNG, **J. For.**, Feb., 1921, p. 131.—Discusses the planting done by the Forestry Department of the University of Michigan in the Vicinity of Ann Arbor, and gives table showing the growth of the numerous species which comprise the plantations.—C.L.

B-2. Some Instances of Sand Dune Planting. C. R. TILLOTSON, **J. For.**, Feb., 1921, p. 139. Describes sand dune planting at Cape Cod, Mass., and near Harlem, Mich.—C.L.

B-3. How New Brunswick Guards Forests. Can. For. Mag., Nov., 1920, p. 507—C.L.

B-3. Quebec's Way of Protecting Forests from Fire. B. N. O.HARA. **Can. For. Mag.**, Dec., 1920, p. 569. —C.L.

B-3. Improvements in Railway Fire Protection. WILLIAM KILBY, **Can. For. Mag.**, Dec., 1920, p. 595. C.L.

B-3. Why the Prairies are Treeless. R. H. CAMPBELL, **Can. For. Mag.**, Jan. 1921, p. 5. The chief onus of blame is laid at the door of fire.—C.L.

B-3. Bark Beetle Combated. Dr. J. M. SWAINE, **Can. For. Mag.**, March, 1921, p. 168. Describes the work of the Dominion Entomological Branch in cooperation with the British Columbia Forest Branch and private timber owners in combating the outbreak of the bark beetle in western yellow pine stands in the Similkameen and Nicola districts, southern British Columbia.—C.L.

B-3. Sky Patrol for Fire Protection. LUTHER K. BELL, **Can. For. Mag.**, April, 1921, p. 226. Describes the use of aircraft in forest protection, in the United States.—C.L.

B-4; E-3. The Pulping of Jack Pine. Can. For. Mag., Nov., 1920, p. 508. Describes the experiments of the Wayagamack Pulp and Paper Company in the manufacture of groundwood pulp from jack pine. The tests made by the company and a report made by Arthur D. Little, Inc., show that jack pine is quite suitable for both groundwood and sulphite pulp. When cooked alone the sulphite from jack pine is quite equal in all respects to spruce pulp. The amount of resin is not excessive.—C.L.

B-4. Wood and its Distillation. A. G. MACINTYRE, **Can. For. Mag.**, Jan., 1921, p. 9. See also articles by the same author at page 92 of the February issue, page 162 of the March issue, and page 232 of the April issue. C.L.

B-4. Standardization of Lumber Sizes and Grades. DAVID G. WHITE, **J. For.**, Jan., 1921, p. 36. See also "The Development of a Brush-Disposal Policy for th

Yellow Pine Forests of the Southwest," by T. S. WOOLSEY, jr., at page 39 of the same issue.—C.L.

B-5. Notes on Slash Disposal in the Lake States. J. A. MITCHELL, **J. For.**, Feb., 1921, p. 141. A very valuable discussion on the many considerations which enter into the slash disposal problem, with special reference to conditions in Wisconsin and Minnesota. Where properly handled, slash disposal results in a great decrease in the fire hazard, and the work can be handled at a cost which is not prohibitive. The article concludes that three things have been demonstrated, namely:

(1) That in the Lake States at least, a compulsory slash disposal is not only necessary and desirable but practicable;

(2) That its administration, however, must be flexible, as no hard and fast rule can be laid down; and

(3) That adequate funds and a trained personnel must be provided for its enforcement.—C.L.

B-6. An Aerial Survey of the Forests in Northern Ontario. R. D. CRAIG, **Can. For. Mag.**, Nov., 1920, p. 516.—C.L.

B-7. Hitching Science to Forest Management. ELLWOOD WILSON, **Can. For. Mag.**, Dec., 1920, p. 581. Argues for improved and modern methods in logging operations comparable to the improvements which have been made in the mill. The sustained yield basis for timberlands must be adopted instead of mining our forests. A selection system of cutting is indicated. The tendency is toward the adoption of more machinery in connection with logging in the east. Discusses diameter limit regulation and forest planting.—C.L.

B-7. How Sweden Handles her Forests. HELGE GRAESLUND, **Can. For. Mag.**, Jan., 1921, p. 35.—C.L.

B-7. Relation of Foresters to the Logging Department. B. F. AVERY, **Can. For. Mag.**, March, 1921, p. 152. An interesting and valuable discussion presented by the forester for the Spanish River Pulp and Paper Mills at the annual meeting of the Canadian Society of Forest Engineers held at Montreal in January. "By mutual consideration for the problems of the other man; by constant personal contact between the members of the logging department and the forester, there will exist a relationship that cannot fail to bring progress in woods management and to hasten the fulfillment of the aim of the profession of forestry."—C.L.

B-7. Management of Pulp Lands in Eastern Canada. E. F. McCARTHY, **Can. For. Mag.**, March 1921, p. 158. A valuable article in which is discussed the conservative handling of the several types of forest to be found in eastern Canada. Emphasizes the potential value of cut-over pulpwood lands and advocates adequate protection and careful management of such lands with a view to a future crop. This paper was presented at the annual meeting of the Canadian Society of Forest Engineers.—C.L.

B-7. Some Observations on Empirical Forestry in the Adirondacks. H. C. BELYEA, **J. For.**, Feb., 1921, p. 115. Discusses the several forest types, influence of logging on the forest, cutting of softwood to a diameter limit, cutting of all merchantable softwood, and clear-cutting hardwoods and softwoods and planting on cut-over lands. Spruce swamp areas lend themselves naturally to clear-cutting methods with natural reproduction. A modified selection system on a conservative basis is recommended for the spruce or balsam flat areas. Hardwood areas must be opened up to such an extent as will induce accelerated growth on the smaller sized trees remaining, after the cutting, without subjecting them to death through exposure. A secondary removal cutting in the second-growth is also indicated for the purpose of obviating subsequent stagnation from over-topping, fast-growing, wide-spreading hardwood crowns. The upper slope forests should be managed on the basis of the protective forest only. Planting on burned-over areas should be undertaken before the native growth of weeds, ferns, and brush offers such competition to the planted stock as will induce very early stagnation and probable extinction. Planting on cut-over lands gives little promise of success unless the area is given a preparatory treatment by burning for the purpose of clearing the site of native seedling and sprout growth. Even then a secondary silvicultural treatment will be necessary in order to remove competing fast-growing hardwoods subsequently seeded into the area.—C.L.

B-9. What's in Labrador? Dr. W. T. GRENFELL. **Can. For. Mag.**, Nov., 1920, p. 499. A brief discussion of the forest resources of Labrador.—C.L.

B-9. Premier Drury on Ontario's Policy. Can. For. Mag., Jan., 1921, p. 21.—C.L.

B-9. The Land We Live In. ROBSON BLACK, **Can. For. Mag.**, Jan., 1921, p. 23. A review of the Dominion's timber wealth, and the progress towards forestry methods.—C.L.

B-9. Where do we Stand in Timber? W. C. EDWARDS, **Can. For. Mag.**, Dec., 1920, p. 536. Prophesies that within fifteen years eastern Canada will be drawing the bulk of its sawn lumber from British Columbia and will be paying for it through the nose on account of high freight rates. The consumer, not the lumberman or the limit holder, is the man who will pay the price of forest exhaustion. The cutting of timber limits has been much more rapid than any new growth could offset, and over and above the waste of the limit through injudicious cutting, forest fires have been permitted to strip thousands of square miles of our most valuable timber. The only remedy for timber land depletion is to gauge the cut by the ability of that particular area to sustain production. Only the mature and diseased timber should be cut.—C.L

B-9. Embargo on Pulpwood Export Proposed. F. J. D. BARNJUM, **Can. For. Mag.**, March, 1921, p. 155. A further discussion of the proposal that restriction should be placed upon the export of pulpwood cut from privately-owned lands.—C.L.

B-9. Timber Areas of the World Outside Canada. Can. For. Mag., March, 1921, p. 171. A brief discussion of the forest resources of some of the tropical and semi-tropical countries.

B-9. Meagre Forest Resources Bordering James and Hudson Bays. FRITZ JOHANSEN. Geological Survey, **Can. For. Mag.**, April, 1921, p. 201.—C.L.

B-9. Can. B. C. Forests Stand Coming Strain? R. W. HIBBERSON, **Can. For. Mag.**, April, 1921, p. 215. Discusses the enormous amount of waste in British Columbia logging and the general economic situation which will result in a continually increasing demand upon the forests of British Columbia.—C.L.

B-9. The Economic Significance of Forestry. GIFFORD PINCHOT, **Can. For. Mag.**, April, 1921, p. 220. See also article in the issue for March.—C.L.

B-9. Connecticut's Forest Program. T. S. WOOLSEY, jr., **J. For.**, Feb., 1921, p. 147.—C.L.

HALF YEAR'S TRADE OF BRITISH PAPER MILLS.

(Special From Our London Correspondent.)

A six months statement, ending 30th June last, has been issued by the Imperial Board of Trade and it shows the great effect the coal miners strike and other disturbing elements have had on the trade of the British mills, as well as shipments of pulp to the United Kingdom. One notable feature of the export trade is the significant difference on the declared values of paper and cardboard when the first half of the year 1921 is compared with 1920. If the figures are correct — and we must assume they are — everything points to the fact that the prices of British paper and board mill products have been on a higher level during the past six months than they were for the corresponding period last year.

One inference to be drawn from this statement is that the British exporter shipped less paper and board during the last half year and got more money from his products than he did in 1920, when prices were higher. The explanation may be that pulps used in the manufactures and labor costs inflated the values.

Fall in Canadian Shipments.

Newsprint was exported to the extent of 1,196,756 cwts. from all sources at a value of £2,427,709 compared with 1,243,480 cwts. at £2,766,987 in the first half of 1920. The countries of supply were: From Sweden, 243,253 cwts. (220,819 in 1920); Norway, 89,614 cwts. (343,659 cwts.); Germany, 36,616 cwts. (41,910 cwts.); Belgium 39,518 cwts. (6,160 cwts.); U. S. A., 4,610 cwts. (41,531 cwts.); Canada, 5,183 cwts. (102,882 cwts.); Newfoundland, 247,430 cwts. (100,945 cwts.); other countries, 530,522 cwts. (385,574 cwts.). These figures for 1921 and 1920 show a material falling off in newsprint from Canada, U. S. A., and Norway, while increased trade is shown with Belgium and Finland, the latter being the principal source in "Other Countries". Newfoundland, it will be observed, occupies a conspicuous place in the list of supplying countries, due in a large measure to studying the market.

Packing, Wrapping, and Tissue Paper was imported to the extent of 480,539 cwts., valued at £1,336,852, compared with 2,382,595 cwts. at £6,398,701 in 1920 and 2,011,222 cwts. at £1,386,791 in 1913. Canada shipped 10,381 cwts. The depression in trade and strikes in the United Kingdom have hit sellers of packing and wrapping paper very hard and there are large stocks in the country. Canadian shipments, though small in comparison to the 1920 figures, are, however, considerably above pre-war supplies.

Canada enjoys a good trade with the United Kingdom in millboards. Strawboard mills in the Dominion will also be interested to know that the British market imported 650,656 cwts., valued at £543,783 during the past half year, compared with 2,116,977 cwts. at £1,935,790 in 1920 and 1,783,923 cwts. at £490,673 in 1913.

Exports of British Mills.

Australia is a good customer of the British mills for newsprint and other printing papers. Next comes New Zealand, India, and South Africa. But while the shipments, 400,965 cwts., valued at £1,676,800, were above those of 1920, the trade has not yet reached the pre-war stage, which, for the first half of 1913 was 1,000,380 cwts. valued at £953,423. The figures for 1920 are 374,213 cwts. valued at £953,423. The figures for 1920 are 374,213 cwts. valued at £1,417,913. A comparison of the quantities and values is interesting for the three years quoted. Canada imported (fine printing paper) 1,554 cwts. during the last six months, valued at £8,810, compared with 1,015 cwts. at £5,280 in 1920 and 67,942 cwts. at £82,829 in 1913.

Increased shipments of writing paper were sent to South Africa, Straits Settlements, Australia, New Zealand and Canada. Canada within the half year imported 672 cwts., valued at £5,127, and 76 cwts. at £902 in 1920. The supplies to Canada are only one-fifth off the pre-war trade and to France about one-fourth.

Canada also imported other manufactures of paper, not specified, to the extent of 1,070 cwts. at £5,170 in 1920. Under this heading there is an increase on pre-war trading. It means 500 tons of paper of some sort going into the Dominions which is not specified on this side of the Atlantic and it behoves the C. P. and P. A. to keep an eye on such imports. Throughout this return on trade I have quoted values for the information of mill owners and pre-war and post-war figures are well worth comparing.

Pulp Imports — Big Decline.

Out of a total of 111,222 tons (217,865 tons valued at £2,781,722 in 1920) of groundwood, (moist), valued at £1,375,071, received during the half year, Canada shipped 21,217 tons, valued at £292,355; Norway 89,222 tons (a reduction of 86,449 tons when compared with 1920) at £1,071,253; and Sweden 444 tons (a reduction of 28,323 tons) valued at £6,831. A notable feature in the falling-off in Swedish supplies, which in 1913, during the first half, amounted to 42,095 tons, as against 26,635 tons from Canada and 173,109 tons from Norway. Canadian supplies, though not up to pre-war shipments, are double those of 1920 which is most satisfactory. The other imports were as follows:—

Groundwood (Dry) 1,227 tons, £33,808, compared with 16,394 tons at £429,579 for first half of 1920 and 4,057 tons at £18,531 in 1913.

Chemical wet: 914 tons, £20,844; 1920, 1,533 tons at £34,695; 1913, 8,843 tons, £32,553.

Bleached Chemical (Dry): From Finland, 51 tons valued at £2,055; Sweden, 205 tons valued at £13,104; Norway, 5,142 at £312,692; Germany, 140 tons at £10,586; other countries, 495 tons at £24,615, which include Canada. A total of 6,033 tons, compared with 16,674 in 1920 and 10,732 in 1913.

Unbleached Chemical (Dry): From Finland, 2,098 tosn valued at £92,470; Sweden, 33,946 tons at £1,405,336; Norway, 16,155 tons at £754,842; Germany, 4,544 tons at £177,559; other countries, including Canada, 2,453 tons at £83,525. A total of 59,196 tons for the half year, as against 252,759 in 1920 and 158,082 in 1913.

The Eureka Blank Book of Holyoke, has announced a wage decrease of 12½ per cent., efffective immediately. About 200 employees are affected. This is the first decrease announced in the history of this company.

Mr. G. T. Milne, now in Johannesburg, will, in October, become Senior British Trade Commissioner for Canada and Newfoundland, succeeding Capt. E. J. Edwards, resigned.

UNITED STATES NOTES

About 150 salaried employees, most of them in the cost and inventory departments, have been laid off by the American Writing Paper Company, Holyoke, Mass. Two weeks pay in advance was given those affected. This is the second big economy move made this year by the company. The first retrenchment measure, taken last April, consisted of reduction of salaries, personnel and pay-roll, affecting every employee, from the president down. The company management ascribes its action to continued business unsettlement, and it claims that its mills operated in June and July at 50 per cent of normal output.

Although paper manufacturers feel they have been deprived of a great deal of business through inactivity of building construction, they do not regard the refusal of landlords to paper their tenants' apartments as a factor in the loss of any trade. The fact is, according to the manufacturers, that business has been good right along. It has been said this Summer, when ordinarily, it is only fair, and this is taken as an indication that the Fall will be as big as they can hope for under present conditions. While landlords have gotten out of the habit of fixing up their leased premises, the tenants themselves are now attending to this to a large extent, and the fact that wall paper is also cheaper this year, is causing them to take the initiative and not wait for the landlord. Buying in general of wall paper lines is reported as more brisk than usual at this season.

The New York State College of Forestry, Syracuse University, has added to its staff of instructors Prof. R. R. Fenska, who resigned recently from the forestry staff of the University of Montana. Prof Fenska will hold the chair of forest engineering at the Syracuse school. He has had a wide and varied experience in the field of forestry. Born in Wisconsin, the son of a pioneer lumberman, Prof. Fenska, spent his early years in the pine forests getting practical experience. He is a graduate of Beloit and Yale forestry schools, he has taught at the Wyman school of the woods, and at the University of Wisconsin, and has been engaged at various times in United States Forestry Service work and surveys.

Drake Hotel, Chicago, has been selected for the annual meeting of the Western Division of the National Paper Manufacturers' Association January next. Robert H. Ritchie, of W. C. Ritchie & Co., Chicago, chairman of the Association, announced the selection of the recently completed Drake Hotel following a conference, and he also appointed a publicity committee of which G. J. Kroeck, of the Kroeck Paper Box Company, will act as chairman.

B. Edwin Hutchinson has resigned his post as treasurer of the American Writing Paper Company to become associated with an automobile concern in the Middle West. Mr. Hutchinson, will also relinquish the office of president of the Holyoke Chamber of Commerce as his new connections will require his undivided time and attention.

Paper mills and other manufacturing plants in Holyoke, were shut down from August 1 to 6, due to the annual stoppage of the headgates of the Holyoke Water Power Company. As usual, the hydraulic equipment of the mills was subjected to an overhauling.

Among the most interesting exhibits shown at the recent Graphic Arts Exposition, at Chicago was that of the Butler Paper Company. This display included a paper making room in which the company gave demonstrations daily of paper making by the method followed half a century ago. Some very good samples of handmade paper were made at this exhibit. Another instructive feature of the Butler Company exhibit was a six-reel moving picture, shown twice daily, which depicted the paper making process, beginning in the North woods and through to the finished paper product and some of its ultimate uses. The picture reel was said to have cost several thousand dollars to produce, requiring its producers to cover over 4,000 miles of territory to get together all its scenes.

A new economy recently put on the market in the stationary line is a self-clasp envelope, the makers of which are said to have completed plans for establishing a chain of factories throughout the United States. S. J. Parks, the inventor of this type of envelope, states that five years ago he began manufacturing this particular style by hand, and four years later invented and patented a machine which now is able to turn out 50,000 daily. The self-clasp envelope is especially designed for catalogues, reports and literature too large for the usual gummed envelope, and has apparently met the demand for a conservative appearing cover which will insure more than a cursory glance at the contents. The The factory making them is located in Long Island City, New York, and it is being run night and day to meet the present demand. It will be relieved of some of this pressure with the establishment in the next few months of factories in several other cities.

P. T. Dodge, president of the International Paper Co., in a statement last Thursday, declared that there was no foundation for reports saying that his company would consider the adoption of wages determined by the arbitration proceeding between representatives of the International unions and a group of paper manufacturers. He said it should be clearly understood that the wages and working conditions set forth in the company's statement to its employees, dated May 24, are the only ones on which the company will employ or reemploy workmen in its manufacturing plants. "Unless business conditions improve," he said, "there will be no object in the company making any effort to start more than two of three of its mills, as their product will not be needed and cannot be sold at any price." Full capacity operation has been resumed in five mills and no more than two or three others will be re-opened until the business situation justifies so doing.

Hearings of the arbitration board mentioned in the above item, were brought to a conclusion with a final session held little over a week ago at Watertown, N.Y. The board spent three weeks visiting all the various paper mill towns collecting data. While no definite announcement has been made, it is believed that meetings for consideration of this data and for arriving at a decision will be held in New York City during the present month.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 6th July.—While, overtly, there are not many tangible signs of increased briskness in the paper trade, as a whole, yet it seems that there is a firmer and more confident under-tone to the trade generally. Looking over the whole field, the buying is, even now, not quite so much of the "hand-to-mouth" description as it was a month ago. In most lines, consumers' stocks have run remarkably low and hence they are forced to come into the market. But still the volume of trade being done in the majority of lines leaves much—very much—to be desired. The fact is that the lassitude in the paper trade is part and parcel of the very general trade lassitude prevalent throughout the country. This business inactivity very directly effects our own industry. For it means an enormous decrease in the total volume of advertising.

It is, in some ways, strange that this should be so. For it is almost an axiom that, when business is slack, then is the time for extra "pep" and "punch" in advertising. But though, in theory, most manufacturers and retailers alike would probably testify to the soundness of this doctrine, a very large number of them do not practice what they have so often preached. Indeed, it is a laughable and ludicrous evidence of the inconsistency of human nature that many a "captain of commerce," who, in newspaper interviews of the "How-I-made-a-success-in-business" type, and in post-prandial orations, is wont to ascribe a large portion of his success to systematic and discriminating advertising, will be among the first to cut his advertising down to a minimum, or even cut it out altogether, as soon as business seems to be losing its bloom of briskness. Such inconsistency would seem to indicate that his faith in "the uses of advertisement" is, after all, not very robust, and yet that is not altogther the case. Every business man knows, in his heart, that advertising is not a luxury, but a necessity, and certainly not least a necessity when business, instead of coming to a firm of its own accord, has to be gone after good and hard. But he finds, when resolved to adopt a policy of retrenchment, that a reckless slash at advertising appropriations will enable him momentarily to effect a retrenchment with less apparent discomfort to his organization than many other methods of economizing which are open to him. So he takes the line of least resistance—and a "penny wise and a pound foolish" policy it is apt to prove, in the long run.

As has been said, the lassitude in the paper trade is part of the general industrial and commercial depression. This being so, a revival in the paper business will accompany, and form part of, the general trade revival for which everybody is anxiously looking. At present, the public is buying, in nearly all lines of commodities, only for the needs of the day. Merchants are mostly carrying only the minimum of goods that they require from day to day. But there is a point beyond which this kind of thing cannot go. A man may get a pair of boots mended a number of times—but, nevertheless, the day comes when he must purchase a new pair or go barefoot. That is the kind of pass to which the purchasing—or, rather, should-be-purchasing—public is coming. The Fall is likely to usher in a revival of buying in most lines. Then retailers will be compelled to purchase a good deal more heavily in order to meet their ordinary requirements. Once more will the wheels of commerce turn apace and business brisk up. And in such increasing business briskness the paper trade will share. In that trade, as in others, depleted stocks in the hands of wholesalers and retailers will force buying on a largely augmented scale.

PULPWOOD. It was pointed out recently that enhanced market activity is unlikely until the possibilities as to price have been more definitely ascertained. Prices, particularly as regard spruce and balsam, are still unsettled. A number of mills still have large stocks undisposed of.

PULP.—There is not much change to report in the actual pulp situation at the moment. Paper mills still evince a disinclination to stock up with much pulp, and there is a clearly-defined tendency to limit buying, just now, to immediate needs.

NEWSPRINT.—More than once reference has been made to the opinion prevalent in publishing circles that a substantial downward revision of newsprint prices is to be looked for. And this opinion seems to be forming into a conviction on the part of those in charge of newspapers and other publications. No doubt this accounts for the fact that, while several of the newsprint mills are pretty busy, and some of them working to a satisfactory capacity, caution, rather than courage, marks the attitude of buyers as a whole. The writer put point-blank to a newspaper proprietor, the other day, a question as to what figure he expected the price of newsprint to reach before it became completely stabilized. The figure he gave need not be given here—but it was of almost appalling modesty. Certain it is that if a substantial reduction in price is not reached before long, it will not be the fault of the newspapers. Their attitude towards the newsprint producers is, very generally, far from friendly—they "want their money back," so to speak.

WRAPPING PAPERS.—The kraft manufacturers believe that prices have reached the bottom, and that there will be no further recession. This attitude they are resolved to maintain. It is one which they believe to be justified in view of the reductions that they have already made—reductions that are out of proportion to the reduction in the price of material or labor. The general situation in wrapping papers varies from the somewhat dull to the fairly good, but the kraft aspect of it is better than the others—the reason probably is that it is becoming recognized that prices have reached rock-bottom. The representative of a large kraft mill told the writer that business in July—which, normally, is a very dull month—was "as good as our business in June, and June was the best month we have had this year." He added that the price of wrapping papers today was only about 100 per cent. over the legitimate price of pre-war days—an increase which, in view of all the conditions of the industry, he considered reasonable, and, in fact, low.



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MANUFACTURING STATIONERY.—Extreme caution is being exercised by buyers of manufacturing stationery. The general slowing down of business has had a very detrimental effect on this branch of the trade.

BOX BOARD.—A fair amount of activity characterizes the box board situation. The mills are not in the position of having all they can do with in the way of business, but, still, things keep moving and prices are fairly steady.

WASTE PAPERS.—The situation as regards waste papers continues dull.

NEW YORK MARKETS.

New York, August 6—(Special Correspondence)—Trade in paper continues of rather narrow compass. There is a moderate demand for certain kinds of paper though it is more or less spasmodic, and there is the usual routine business passing in all grades, but the market as a whole is decidedly quiet and current business is hardly as good as it customarily is during the mid-summer of the year. Consumers are inquiring a little more freely as a general thing, which serves to buoy up sentiment among paper producers and dealers, but actual buying has not improved to any material extent and the firmer feeling in some quarters of the trade seems to be based principally on expectations that the time is not far distant when demand for paper will appreciably broaden.

The latest report of the Federal Trade Commission, covering the month of June, shows that production of paper of all kinds increased in that month a few thousand tons above the May output, and that in spite of the larger production, mill stocks of paper declined during the month. This would indicate that manufacturers are shipping out not only their current production but also a small part of their surplus stock, which situation is viewed in a bullish light by most members of the trade. As a matter of fact, everything would seem to point that business in paper; that is, retail business, is not as poor as many in the trade are inclined to describe it. One of the troubles with the paper manufacturer and jobber today is that his mind is still set on the tremendous volume of business done in the boom period following the war, and that they gauge the market at present with that time rather than with more normal periods. Naturally the result is that the average trade authority is disposed to describe business as extremely dull, when the probabilities are, that, based on the normal volume of buying, the market is not so bad after all.

Jobbers around and in New York City mostly say that small-lot demand is improving. Printers are said to be absorbing a larger number of individual parcels of paper, and demand from other consuming quarters is easily holding its own although the average transaction involves but a small quantity of paper. Mills are not yet feeling this demand because the aggregate amount of buying is such that jobbers, with a few exceptions, are enabled to supply customers without having to place orders for sizable tonnage with manufacturers.

Newsprint is rather easy. Rumors that prices to contract customers will be reduced during the final quarter of the year persist, and have a quieting influence on buying. Publishers are disinclined to place contracts excepting for small tonnage required to cover their wants over August and September, and transient buyers also are operating cautiously. Moreover, repeated offerings of foreign newsprint at prices below those prevailing on domestic paper have a weakening effect and tend to make for careful buying on the part of consumers. It is doubtful whether better than 4.50 cents a pound can be secured from transient buyers for roll newsprint, it being claimed by consumers that they can get all the supply wanted at about this basis or lower. Sheet news also is easy and gradually moving lower in price. About 5.25 cents per pound is considered the market basis on spot lots.

Book papers are quiet from the producers' point of vantage, though activity in the jobbing trade appears to be on the rise. Quotations hold at between 6 and 6.50 cents on machine finished and from 7 cents upward on super book at the mill. Fine papers continue to recede in price. One of the large mills in the East circularized the jobbing trade with samples of a wood bond this week which it offered at 8.50 cents f.o.b. mill in case lots. This paper was of course of rather poor quality, but the price at which it is quoted shows how low bond papers can be bought. Fine paper mills unquestionably are badly in want of business. It is stated by an authority in the trade who periodically travels through the Holyoke district that writing paper plants are not running better than 40 per cent of capacity on an average, while some mills are reported entirely closed down temporarily.

Another dull branch of the industry is the roofing paper trade. This is strange in view of the fact that a tremendous boom in building has set in throughout the States, but roofing felt manufacturers declare they have not felt the effects of this thus far. Apparently surplus stocks of building papers are being used up before consumers and dealers are obliged to go to manu-

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Paramine Fast Bordeaux B.
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facturers for supplies. There is a very bullish feeling in this branch of the trade; nearly everyone expects active business in roofing papers in due time. Perhaps the prevailing dullness is the lull before the storm, so to speak.

Boards are moving in slightly larger volume though the bulk of current activity consists of deliveries against orders placed by buyers a few weeks ago. Prices on box boards are in about the same position previously noted, plain chip being quoted at $28 a ton at the mill and filled news board at about $32.50, with some of the nearby mills delivering board into New York at these figures.

GROUND WOOD.—Mechanical wood pulp is in comparatively good demand and prices are marked by steadiness. Domestic producers are asking and receiving around $28 per ton f.o.b. grinding plants, and consumers appear to be absorbing the bulk of supply offered at this price basis though buying is very orderly and there is no keen competition among buyers to secure pulp. Reports from grinding districts invariably tell of this or that mill being closed down in part or entirely, owing to poor water conditions, and such reports obviously have a strengthening influence on the market in that they substantiate the belief existing in numerous quarters that a shortage of ground wood will arise before the winter arrives. Opinion in this connection is prompting grinders and dealers to offer supplies out in rather small amounts, and not to press buyers to take ground wood off their hands.

CHEMICAL PULP.—Offerings of foreign sulphite and kraft pulp at new low prices have further unsettled the chemical wood pulp market, and it can be said that the domestic situation as a result is in a condition bordering onto chaos. Imported bleached sulphite of No. 1 grade is being sold by New York import concerns at 4 cents per pound ex the dock here, while No. 1 unbleached sulphite is freely offered down to 2.50 cents per pound and foreign kraft pulp at 2.40 cents. The reason importers can sell pulp at such prices, it is stated, is largely that of exchange, it being understood that a large part of the supply available in the market at present is of German origin, exchange on which country is so low that importers are enabled to sell pulp in the States at prices which domestic producers claim they cannot manufacture pulp for. There are no stable prices on domestic pulps. Quotations are on broad ranges, and probably only buyers can learn at just what prices purchases can be made. Some fairly large tonnage sales of foreign pulp are said to have been made to American paper mills, particularly in the Middle West, at the low prices obtaining.

RAGS.—There is little demand for rag stock, and prices are irregular and in an uncertain position. Consumers are coming into the market only at spasmodic intervals, and even then are absorbing but minor quantities of rags as directly needed; roofing paper manufacturers, for example, seldom placing orders for more than five carloads when ordinarily they buy anywhere from 15 to 20 cars upward at a time. New cuttings are scarcely wanted, and old whites and blues are sought only in light volume. Repacked old thirds and blues city origin are available at 1.50 cents per pound at shipping points, and No. 1 repacked whites are offered at 4.50 to 5 cents, depending on the grade; No. 2 repacked at around 2.50 cents, and No. 1 miscellaneous packing of whites at 3.75 cents. No. 1 roofing rags are selling at around 75 cents per hundred pounds at shipping points, while No. 2 satinets have been bought by felt mills down to 62 ½ cents f.o.b. New York.

PAPER STOCK.—All grades of old paper are in limited demand, but a comparative scarcity of some descriptions serves to sustain values in the face of the light movement into consuming channels. For example, soft white shavings of No. 1 quality are held at 2.10 to 2.20 cents per pound New York by dealers, who generally refuse to book orders for less, claiming that printers are cutting few shavings at present and that packers consequently are holding firmly such stock as they have on hand. White cuttings also are steady at about 1.50 cents a pound at shipping points. Perhaps a carload or two might be secured at a trifle under this level, but no dealer will commit himself on a sizable tonnage at less. Old books command an average of 85 cents a hundred for No. 1 heavy flat stock, No. 1 old kraft is bringing 1.50 cents, hard white shavings of No. 1 grade about 2.65 cents, and ledger stock in the vicinity of 1.50 cents. Folded newspapers and No. 1 mixed papers are weak and board mills in the East are filling their requirements through purchases at an average of of 32½ cents New York for the former and 22½ cents for the latter.

OLD ROPE AND BAGGING.—Old rope rules quotably steady at around 4 cents per pound for No. 1 manila rope at shipping points, with now and then a lot of imported rope offered a little under this price. Bagging is dull and nominal in price.

LINK-BELT STEEL CHAIN DATA BOOK.

The Link-Belt Company of Chicago, Indianapolis, and Philadelphia have just issued a new Steel Chain Data Book No. 475.

In his book is presented completely the heavier rugged steel chains used for Power Transmission, and also including Elevating and Conveying Chains.

Copies can be secured by any of our readers interested in this subject by addressing the Link-Belt Company.

We quote from the foreword of this book:—

Sprocket wheels play as important a part in the satisfactory operation of a drive as the chain itself.

If you are looking for satisfactory operation of a chain drive, and a low maintenance cost, don't expect to get it by buying a chain from one maker and sprocket wheels from another.

You can do that with leather or rubber belts and pulleys, but not with chain and sprockets.

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WHAT DID YOU DO?

Did you ever send out "the one and only" catalogue in your line and then, after the natural first wave of orders, find you had run into a dull and sickening calm? What did you do?

A recent issue of "System" tells how one alert manufacturer answered the problem by means of a Sales letter.

He would pick out a few lines open for cancellation next year and offer these at a discount—BUT—he referred to them in his Sales letter by number and catalogue page. He got orders for the discounted lines and other orders also, because he got the buyer thumbing through the catalogue—which was the purpose behind the Sales letter.

It certainly sounds worth trying.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., August 18th, 1921. No. 33

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

Subscription to any address in Canada, United States and British Empire, $5.00 yearly. Other Countries Postage Extra. Single copies, 15 cents.

Changes of advertisements should be in the Publishers' hands ten days before the date of issue.

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EDITORIAL

THE CHEMISTS OF THE EMPIRE.

The best chemical brains of the Empire are represented in the Society of Chemical Industry. The last few years have shown how dependent a nation is on its chemical power, both in military and industrial matters.

Canada is honored as the meeting place this year of this great society of chemists and the convention will begin in Montreal on August 27th. A program is given on another page. Special attention is given to the pulp and paper industry, not only as a *key* industry of Canada, but one where chemistry is the predominating scientific factor. All interested are invited to attend the meeting. (See article on another page.)

LABRADOR.

"Yez can't believe half yez hear, and the rest ain't true", said Pat. Perhaps he was right. The Irishman's observation is brought to mind by recent conflicting reports regarding pulpwood in Labrador. Mention has already been made in the Pulp and Paper Magazine of the expedition by airplane and on foot in charge of Major Owen in 1919. He reported excellent stands of spruce and a company of rather large capitalization was formed. Some people, who are not as enthusiastic over Labrador as Dr. Grenfell, for instance, were a bit skeptical of Major Owen's statements and this summer a party under Mr. H. C. Bellew, of Montreal, did a little exploring and report that nothing but scrub spruce was found.

That is what others have said.

On the other hand, Mr. A. Tourangeau, a director of the Quebec Labrador Pulp and Lumber Co. spent three months exploring the company's limits last year and had been over the ground in 1914. He declares that the Bellew party, absent, from Nova Scotia only from July 14 till August 4, could not have done a thorough job, especially as they had some serious mishaps, and makes the assertion, backed by airplane photographs, that there are millions of feet of good timber in Labrador. He says:—

"There is no wood for 15 or 20 miles back from the sea coast, and any expedition that went to look over the timber possibilities would have to spend two days before getting into the wooded area. Our limit is on the Pinware River, and covers 734 square miles. Our American lumber cruiser declares that he can guarantee 2,800,000 cords of pulp wood on the limits, besides the saw timber. There is a large river and water power capable of developing 8,000 h.p."

"The expedition superintended by Major D. Owen in 1919 was to the southern portion of Newfoundland Labrador, about Battle Harbour, which is not quite so far down as Hamilton Inlet, where is located the limit that Mr. Bellew went to explore."

Now Labrador may be called a limitless country, inasmuch as the boundary between it and Quebec has never been definitely fixed. It is therefore quite possible that both reports are reasonably accurate when all the circumstances are known and considered. The country lies southeast and east of the height of land, the rivers flowing into the north Atlantic ocean, the winds from which would be cooled by the icy Labrador current. It is unfortnate that no impartial government survey has been made, the knowledge we think we have coming from exploration by parties having the exploitation of the country (some are so unkind as to intimate other motives in view). Both the reports referred to agree that there is no timber on the sea coast. Whether there is enough on then interland plateau to support an industry is something we don't know.

The whole question further emphasizes the position we have always taken in such matters, namely, if a person contemplates putting money into any business, he should get reliable information as to the resources behind the proposition. This is nowhere more essential than in an industry dependent on the forest, the extent of which is so easily exaggerated, or expressed so as to be misunderstood by the ordinary investor. We refrain from taking any sides on the Labrador question until we have better information. The situation emphasizes the need for an accurate survey and inventory of our resources. If there is wood in Labrador that can be economically exploited, it should be utilized. In the mean time we would point to the familiar sign: "Look before you drive in."

1031 *FEET! CONGRATULATIONS!*

A long distance telephone message last Friday brought the good news from Grand'Mere that newsprint machine No. 9 was making first class paper at 1031 feet per minute. This constitutes the world's record for machine speed in making good paper. It was not just a sprint, either, as the machine has been running at better than 1,000 feet steadily for several days and the output is more than satisfactory. Furthermore, it is good paper; we have a sample of it. While it seems that the preparation of the stock might be improved a little, the formation is good and the finish is all that could be desired. We believe, that, except for the motors, which came from England, the whole machine, including felts, represents Canadian industry and ingenuity.

We congratulate the Laurentide Company, the Dominion Engineering Works, the Harland Engineering Co. and any others (including the machine crew) who have brought this honor to the Dominion.

While we are properly enthusiastic over the exploits just mentioned, it would not do to pass a similar important event in the United States. At Wisconsin Rapids, the Consolidated Water Power and Paper Co. is operating a newsprint machine built by the Beloit Iron Works to run at 1400 feet. It is driven by a General Electric sectional drive. At present the machine is running at about 800 feet and will, no doubt, be equal to 50 per cent better than that. The starting of the big machine was the occasion for a 48 page special edition of the Wisconsin Rapids Daily Tribune, which contains a complete description of the mill, the machine and a number of special articles on appropriate subjects. It is a fine number. Great credit is given to the vision, faith, courage and inspiration of the president of the C. W. P. & P. Co., a man widely known and well loved by the Canadian pulp and paper industry, Mr. George H. Mead, also president of the Spanish River Pulp and Paper Mills.

BIG, EVEN FOR NEW YORK.

The Exposition of Chemical Industries, to be held in New York the week of September 12th, will be big, even for New York. This annual show of chemical and allied iindustries has become an important event and is really a milestone on the road of chemical development. Perhaps it would be more appropriate to say that this effort is a monument to the industry that, perhaps, more than any other, is responsible for the present state of our civilization.

To attend this exposition is not only a remarkable educational opportunity but a convincing demonstration of the fundamental part which industrial chemistry plays in our daily life.

The Industrial and Educational Publishing Co., will be there, and readers of the Pulp and Paper Magazine are invited to make the fulltst use of our booth at the 8th Coast Artillery Armory, September 12-17.

COBWEBS.

Secretary Hoover's "assay of industrial waste" in the United States, shows that the building trade wastes 1-3 of possible working days. This is largely due to the shifting of skilled men from job to job.

A single day's imports of chemical pulp from Europe last week totalled more than 18,000 bales. Prices mentioned were close to pre-war figures. It looks as if foreign pulp makers were selling below cost or living below par, for the benefit of U. S. paper makers.

Benjamin Strong, governor of the New York Reserve Bank, told a Congressional Committee that the industrial depression is definitely at an end.

Apropos of the passing of dividends, it is cheaper to hold money in the treasury, for a possible rainy day, than borrow more if it pours; and if it doesn't rain, the sunshine is all the brighter when the clouds have passed—there is cash on hand for the picnic.

In 1920, the monthly average of imports by France of Canadian newsprint was 507 metric quintals; in 1921 (six months), the average was 62, with no imports at all in June. For paper boxes, the only other place where Canada appears, the figures were 55 for 1920 and 4 for 1921.

It is a pretty state of things when a strike of British shipyard workers makes it necessary to send a Canadian ship to a German port for repairs.

DEFORESTATION IS CAUSE OF FAMINE.

China's great famine is the result of deforestation, according to foresters of the United States Department of Agriculture, who asserted in an official statement today that the once fertile country of China is now subject to frequent droughts and floods, that mountains, stripped of trees and undergrowth, allow rains to run off rapidly, and that the result is famine in seven out of every ten years.

"The ruthless destruction of their forests by the Chinese," the Department of Agriculture's statement read, "is one of the reasons why famine and plague today hold this nation in their sinister grasp. Denudation, wherever practised, leaves naked soil; floods and erosion follow, and when the soil is gone men must also go—and the process does not take long." Forests, it is pointed out, not only play an important part in the distribution of mankind over the earth's surface, but also deeply affect his spiritual, physical and economic life. A country that recklessly wastes its natural resources faces ultimate poverty and decadence. History is full of such examples.

"In the provinces of Honan, Shensi and Chihli, China, over an area some 100,000 square miles in extent, several million people are starving. The immediate causes of the famine were disastrous floods, followed by long periods of drought, which resulted in the failure of three successive crops."

A STATIONERY TEST.

A firm had a certain proposition to make to a large list of possible customers. It did not know whether to use good or cheap stationery and determined on a test. Two thousand names were picked at random from the list. One thousand letters on good and one thousand letters on cheap stationery were mailed—not a particle of difference, except in the quality of the stationery. The cheap stationery brought 20 per cent inquiries and the good stationery 32 per cent.—Business Methods.

When morning comes get into your clothes in a hurry and then get into a hurry in your clothes.—The Hoffman Henchman.

The Wall Street Journal in a recent issue significantly declared that "of 1920 failures, 84 per cent were firms which did not advertise. There's an implied contract with the public in honest advertising which tends to keep a firm straight."

The man who looks for a long period of depression is quite as foolish as the one who thought war profits could last for ever.—A One Philosophy.

Groundwood Preservation Tests

By JOHN S. BATES.

The experiments described in this paper were carried out in the Kenogami Mill of Price Brothers & Co. Limited. The large-scale preservative treatments of groundwood pulp were undertaken in July and August, 1919, and represented one phase of investigation in connection with the general study of decay in wood and pulp. (See also Pulp and Paper, July 30, 1921.)

Each year during the high-water periods of the spring and summer several thousand tons of groundwood laps are stored for use in the following winter and considerable quantities are carried several years. In the large pulp storage building there is a certain amount of rotting and discoloration, especially at the crevices between the piles. This is lessened by keeping the water circulating in the groundwood system at a moderate temperature during the summer, so that the pulp does not go into storage too warm. Laps piled outdoors usually remain in good condition due to low temperature and good ventilation, the trouble being mainly with freezing of laps during winter use, mechanical losses and dirt. Both lapped groundwood and pressed bales are subject to deterioration by the action of fungi and moulds.

A good deal has been written on the subject of decay in groundwood pulp and it is hardly necessary to review the principles. The typical varieties found in the pulp storage building were red or brown rot, dark brown or black rot and grey discoloration. Laboratory tests showed that the reddish-brown rot extending through portions of the pulp was the most serious, as the fibrous nature of the pulp was largely destroyed and hot water extraction gave losses of from 5 to 10 per cent or more. According to the drainage test figures the freeness of the infected pulp was much the same as sound pulp, but on mixing the two there was a decided slowing effect due to the finely divided red pulp. The dark brown or black rot gave a bad appearance to the pulp but was largely confined to the surface layers of the laps. Samples showed losses of from 3 to 5 per cent by extraction with hot water, compared with 2 or 3 per cent for sound pulp. Grey streaks were common in storage laps, the discoloration of moisture resulting from pressure in the pile. The grey color disappeared with oxalic acid and appeared to be iron tannate stain (perhaps caused by tannic acid in the wood and iron in the mill water forming a slight amount of ink in the pulp). The fibres were unaffected and the hot water extracts were low.

Preservative treatment of wood is practised commercially on a large scale, chiefly on railway ties, wood paving blocks and other wood products that are placed in fairly damp locations where fungus action is rapid. The chief preservatives are coal tar creosote oil and zinc chloride; sodium fluoride, mercuric chloride and other substances are also of importance. As groundwood pulp is merely finely divided wood, it was thought worth while to try ordinary wood preservatives even though the action in the case of pulp might be somewhat different. Certain preservatives such as creosote oils of course cannot be used because they would discolor and oil the pulp. Zinc chloride, mercuric chloride and sodium fluoride were chosen from among the water-soluble preservatives which might be used without serious trouble in connection with using the pulp after storage. Zinc chloride is somewhat corrosive and acid in tendency. Mercuric chloride is highly toxic but rather dangerous to handle on account of being so poisonous. Sodium fluoride is a harmless white salt and has the advantage of being only moderately soluble in water (about 4 per cent) which reduces the tendency of leaching out after treatment of the wood or pulp. The salt is neutral in reaction and non-corrosive. The possibility of liberating strong hydrofluoric acid in the presence of acid is a doubtful disadvantage, as the pulp is not likely to meet with such a condition.

When wood is treated, the preservative is usually forced in by flooding the wood with the solution or oil in a large retort and applying high air pressure and moderate temperature for an hour or more. Even then the preservative penetrates across the grain less than an inch to protect the exposed surfaces. Treating pulp is much simpler because the material is finely divided. The problem is mainly one of mixing the preservative uniformly with the pulp and at the same time preventing a large loss of chemical in the water pressed from the pulp. A simple method for commercial practice would be to have a wet machine with two pairs of press rolls, the first for pressing out the water from the thin sheet and the second for reeling up the lap under light pressure while the small amount of preservative solution is sprayed on the top roll so that practically all the chemical would stay in the pulp. For the experiments one of the ordinary groundwood wet machines had to be used. The chemical solution was made up with water to the desired strength in barrels feeding by gravity to a measuring cylinder placed above the wet machine press rolls. This cylinder was connected by flexible hose to a brass spray pipe perforated on top with 1-16 inch holes spaced two inches apart, the spray pipe being mechanically oscillated two inches back and forth during each revolution of the press roll. The valve was adjusted to feed the solution at a very slow rate as calculated (about five pounds of solution per minute). The solution from the spray pipe fell on a felt roll fitted to the top press roll, so that the chemical was continuously forced into the pulp sheet as it formed into a lap. The feed was simple and automatic, except for making up the solution in the supply barrels and occasionally adjusting the control valve attached to the measuring cylinder.

The ordinary lap was made up of about twenty layers of this groundwood sheet in one minute and weighed about 33 lbs. wet, equivalent to about 10 lbs. of air-dry pulp (based on 10 per cent moisture content). Tests showed that in forming a lap on the wet machine approximately 100 lbs. of water were pressed out from the wet groundwood sheet and in addition 100 lbs. of water were pressed out from the felt, so that roughly 200 lbs. of water were removed at the press rolls in producing a lap containing 10 lbs. of air-dry pulp. There was, therefore, a good chance of losing some of the chemical solution by continuous squeezing between the press rolls, although this was lessened by spraying the strong solution on the top of the upper roll. The white water from the press rolls was measured and sampled at intervals during the treatments with the idea of measuring this loss of chemical by analysis, but the determinations did not prove satisfactory. Samples of pulp were also taken from occasional laps in the hope of finding the propor-

tion of chemical remaining in the pulp, but these analysis were difficult and inaccurate. While the amount of preservative used in each case was known, it is hard to say what proportion actually remained in the pulp. However, the uncertainties of treatment and losses of chemical could be corrected by suitable arrangement of equipment if regular commercial treating were taken up.

Each treated lap was weighed and marked for identification. Untreated laps were also taken and marked for comparison in storage. Moisture samples were cut at intervals to determine the dry weight of pulp. In each test the equivalent of from one to two tons of air-dry pulp was treated. The pulp from the six runs was stored under various conditions, as will be described later.

According to Humphrey, (*) the toxicities of the preservatives to wood-destroying fungi, in terms of concentration of chemical on the volume basis (grams per 100 cc. of medium), sufficient to prevent fungus growth, are as follows: — zinc chloride 0.5 to 0.75 per cent, mercuric chloride below 0.1 per cent, sodium fluoride 0.15 to 0.25 per cent. These figures served to some extent as a guide in choosing the proportions of chemicals to be applied to pulp. For convenience the proportions were figured on the air-dry weight of the pulp, these percentages being considerably higher than the equivalent concentrations on the volume basis. The treatments of groundwood pulp were designed to give one light and one heavy treatment with each preservative, the former representing moderate cost and possible value in retarding decay and the latter representing high cost but certain preservation from decay if the substance is any good for the purpose. The proportions of preservatives used to air-dry pulp treated were: zinc chloride 1.11 per cent and 3.61 per cent, mercuric chloride 0.057 per cent and 0.187 per cent, sodium fluoride 0.581 per cent and 2.90 per cent. The zinc chloride was commercial grade in fused form as ordinarily used for wood preservation and analyzed about 90 per cent purity. The mercuric chloride was the chemically pure grade. The sodium fluoride was commercial grade in powder form as used for wood preservation and was about 91 per cent pure. The lighter treatments cost in the neighborhood of $2 per ton of pulp while the heavier treatments cost roughly $7 or $8 per ton, as far as the values of chemicals are concerned. The more important details are summarized in the table.

The analysis of pulp and white-water samples for chemical contents proved so difficult that it was decided not to carry them to completion. In the light zinc chloride treatment the retention of chemical in the pulp was approximately 80 per cent of the total used, while in the heavier zinc chloride and sodium fluoride treatments the retention was only about 50 per cent.

The storage tests were carried out under various conditions to find the relative merits of the preservatives in retarding decay for a long period. This was the really difficult part of the problem, owing to the number of factors which affect the progress of decay and the uncertainty of determining exactly what the conditions and results really are. However, the general observations during a year and a half of storage were definite enough to allow certain valuable conclusions.

From each run the main supply of treated and untreated laps was piled in the groundwood pulp storage building. For the first eight months the pulp remained in separate, exposed piles at one end of the building in a cool location where very little deterioration would be expected in any case. At the end of this period there was little change in the pulp. The only distinctions noted were that the zinc chloride had caused small black spots to appear through the pulp and that the mercuric chloride had produced small gray patches on the surface. These defects will be discussed later.

When the regular pulp was out of the building, the special piles were transferred to the centre of the floor and were gradually covered up by the season's supply of storage pulp. After twelve months under ordinary storage conditions the piles were again open to inspection when the building was nearly empty. The black spots in the zinc chloride laps were more pronounced than before, as were also the dark grey patches in the mercuric chloride laps. The sodium fluoride laps were all in excellent condition, the only change being a certain amount of pale grey discoloration as ordinarily found in storage pulp. The untreated laps in each case followed the treated laps in appearance to some extent, showing the effect of contact in the mixed piles. In general the untreated laps showed less black discoloration but slightly more rot of the ordinary varieties, although deterioration was not serious after nearly two years in storage. The piles were moved to another location in the storage building for further observation.

The most striking results were obtained from storage under conditions where fungi and moulds could develop at a faster rate. After each treatment on the wet machine about twenty treated laps and ten untreated laps were taken for special storage in a brick kiln in the paper-mill basement. In each of the six piles the untreated laps were placed together in the middle section

(*) "U. S. Dept. Agric., Bulletin No. 227, "The toxicity to fungi of various oils and salts, particularly those used in wood preservation."

TABLE I—SUMMARY OF PRESERVATIVE TREATMENTS.

Preservative Used.	Zinc Chloride		Mercuric Chloride		Sodium Fluoride	
Treatment	Light	Heavy	Light	Heavy	Light	Heavy
Weight of wet treated pulp, lbs.	13,713	8,966	7,018	10,893	10,675	6,376
Average air-dry pulp, per cent	29.3	32.1	29.1	31.1	28.6	29.5
Weight of air-dry treated pulp, lbs.	4,018	2,878	2,042	3,387	3,053	1,880
Average rate of air-dry pulp from wet machine, lbs per minute	12.25	9.9	9.4	10.4	9.8	9.85
Strength of solution, per cent	3.0	7.15	0.107	0.428	1.14	2.86
Rate of solution feed,—lbs. per minute	4.54	5.0	5.0	4.54	5.0	10.0
Weight of original chemical based on weight of air-dry pulp treated, per cent.	1.11	3.61	0.057	0.187	0.581	2.90
Cost of preservative.						
Dollars per lb. of chemical	0.10	0.10	1.75	1.75	0.15	0.15
Dollars per ton of air-dry pulp	2.22	7.22	1.99	6.55	1.74	8.70

and were separated from the treated laps by pieces of cotton dryer felt. The kiln outlets were closed to block ventilation and water was placed in a barrel to keep the air humid, while the temperature was maintained between 20° and 30° Centigrade. In a few weeks there were distinct signs of decay and the progress of rotting continued steadily. The pulp was examined from time to time by opening out each lap. Although the atmosphere in the kiln was kept decidedly humid, there was considerable drying out of the pulp, the top laps finally becoming nearly air-dry and the bottom laps retaining their original moisture content of about 70 per cent. The canvas dryer felt moulded and affected the adjacent laps in a special way.

The results after eighteen months in storage will serve to show the comparisons. The laps from the light and heavy zinc chloride treatments were badly discolored by characteristic black spots scattered through the pulp, the effect being worse in the case of the heavier chemical treatment. There were also a few bright red patches, but the ordinary forms of brown and black rot were present only to a very slight extent. Through the courtesy of Mr. F. J. Hoxie (Special Inspector, Associated Factory Mutual Fire Insurance Companies, Boston, Mass.) and Mr. H. N. Lee (now Microscopist, Hammermill Paper Company, Erie, Pa.) typical samples were examined and photomicrographed early in 1920. The black spots were caused by clusters of brown fungus filaments, so that the peculiar fungus discoloration was apparently stimulated by the presence of zinc chloride. The untreated laps in this group were seriously affected by red, brown and black rot which extended through many laps and by white surface mould as well, while the black spots typical of zinc chloride were absent. Some of the laps were so far gone that they fell to pieces on handling.

The laps from the light and heavy mercuric chloride treatments were also badly discolored but in a different way than the zinc chloride laps. There was a speckled appearance, mainly on the surface, due to characteristic green and gray patches. Hoxie and Lee showed that this was mould, probably *Penicillium*, which causes the ordinary moulding of bread. Practically no red rot was present and the pulp had been fairly well preserved from decay, but the appearance was bad on account of the peculiar moulding stimulated by the chemical treatment. On the other hand the untreated laps were in much worse condition due to brown rot, large black patches of powdery mould and white surface mould.

The laps from the light and heavy sodium fluoride treatments remained in such good condition that the comparisons were striking. In most cases the laps looked the same as when they were put into the kiln. In the lower portions of the piles where no drying had taken place there were a few pale grey patches such as usually occur in regular pulp coming from the storage building. Hoxie and Lee pointed out that this discoloration was not due to fungus or mould but was probably an iron tannate stain. The color disappeared when samples were treated with oxalic acid and in various respects it acted like a simple iron tannate ink, as proved by making up such a mixture in pulp for direct comparison. After eighteen months in the kiln the treated laps were fully as good as sound storage pulp and the light treatment with sodium fluoride had been sufficient to preserve the pulp from decay. The untreated laps in these piles were not as bad as in the other groups, perhaps due to partial protection by association with the treated laps. The untreated laps, however, were noticeably affected by decay in the form of black and brown rot and slight mould.

As a check on the above kiln experiments, a second kiln was later brought into service to try the effect of accelerated rotting conditions on some of the laps that had been in the pulp storage building for the first eight months. Piles of about twenty laps each were stored in this kiln, the treated laps in each case being in separate piles from the untreated laps to obtain a fairer comparison. Although there had been only slight deterioration in the storage building, the pulp soon began to rot in the warm moist kiln. After ten months the results were almost directly in line with those described for the first kiln, except that the rotting had not progressed quite as far. Here, again, the treated laps were in general decidedly better than the untreated laps, while the sodium fluoride laps were outstanding in comparison with the discolored laps of the two other chemical treatments. It was also noticed that screenings stood up better than fine pulp. Furthermore, there was reason to think that pulp which had dried slightly to a medium moisture content was more rapidly attacked by fungi and moulds than laps which had remained damp or had become decidedly dry.

In conclusion it appears that sodium fluoride is a promising preservative for groundwood pulp. Under the varied conditions of testing it preserved the original color and quality of the pulp satisfactorily. The lighter treatment was sufficient and was comparatively inexpensive. Further experience would be necessary to establish the exact proportions of chemical necessary, the costs of treatment on a commercial scale and the effectiveness in retarding decay under all conditions of storage. For those cases where groundwood pulp is likely to suffer serious deterioration during long periods in storage or shipment it is possible that a preservative treatment of this kind would prove economical and valuable.

N.B. STUMPAGE RATES DISCUSSED.

St. John, N.B., August 10.—The Provincial Government met in session here this afternoon and evening. The most important question to come up was that of stumpage rates in this province.

In the afternoon, a delegation, consisting of Hon. J. P. Burchill, A. Mclean, F. M. Anderson, Donald Fraser, W. B. Snowball, F. W. Beatteay, Jas Robinson, John E. Sayre and R. W. McLellan, waited on the Government. A memorial was presented dealing with different questions in regard to the administration of the Crown lands, and requesting that certain changes be made in regard to colonization. It was also requested that the method of scaling be changed and that of Quebec adopted. The delegation asked that the stumpage rate on spruce be reduced to $2.50 a thousand, this rate to be retroactive for last year's cut. It was contended that this action was necessary on account of the bad condition of the lumber market, the depreciation in the value of last year's cut and the large quantity of lumber now on hand that there is no market for. The Government promised consideration of the requests made.

Among the suicides in the U. S. A. last year were thirty-six millionaires and twenty-three million-heiresses. Evidently having money to burn doesn't get rid of all the troubles of life.—Pathfinder.

CROWNING A CALENDER ROLL.

Although not many men are called upon to perform this delicate operation, nevertheless the successful crowning of the roll plays such a vital part in the making of paper that everyone is more or less interested.

The following article taken from The Super-Calender, a publication issued by the Pusey & Jones Company, contains some suggestions and information that might be of value to the readers of Pulp and Paper. The article, which was in the form of a letter, says:

For a stack of calenders it is customary to put the principal crown in the bottom roll only, also a much smaller crown in the top roll, and no crown at all in the intermediate rolls, grinding these perfectly straight or of the same diameter throughout their faces. The crown, which means larger diameter in the center than at the ends, is put in the bottom roll to make up as much as possible for its deflection, and thus make its top as near as may be a perfectly straight line. The bottom of the roll will then be nearer to the floor in the middle of its length or face than the ends, and will form a curved line from one end along the bottom, to the other end.

A roll or a shaft will deflect slightly from its own weight, but in addition to its own weight,-which it must carry, a bottom calendar roll must also carry the weights of all the rolls in the stack above it, and it must also carry the weight or pressure which is put on the journals of the top roll through the system of weights and levers on the top journal boxes. The amount of crown of bottom calender rolls vary with the diameter and with the face of the rolls. A botton roll may be considered a cylindrical beam supported on both ends, and uniformly loaded throughout its length. The formulas for strength of such cylindrical beams indicate that strength and stiffness vary in proportion to the cube of the diameter, and therefore, you can see how quickly the strength and stiffness of such a roll increases by every inch in addition to diameter. The strength and stiffness of such a cylindrical beam also vary inversely as the length or face, and therefore, of two rolls of the same diameter, but of different faces, the longer roll should have more crown than the shorter in proportion to its face, but of two rolls of the same face, the strength and stiffness varying in accordance with the cube of the diameter, the larger the diameter of the roll, the more rapidly less would become the need for the crowning.

Perhaps we would judge that for the botton rolls of stacks of calenders for paper machines, the crowns would vary between probable limits of from .010" to .030". Of course, .001" is a very small measurement, but several of them together make a measurement that is quite appreciable, particularly when it is indicated by a micrometer caliper, which should always be used when grinding rolls.

A very small amount of crown is usually put in the top roll of a calender stack, because the strain downwards on the journals, due to the weights and levers, tends to spring the ends of the top roll downward and the middle of the roll is made slightly crowned or a little larger in the effort to make the middle of the roll press as hard as the ends press. All the intermediate rolls of a stack are ground straight, because theoretically and practically too, they are squeezed between the straight line of the top of the bottom roll, and the straight line of the bottom of the top roll.

It happens to be a curious coincidence that today one of our expert men is away at a paper mill, because they have reported that of two stacks of calenders, the rolls of which we recently ground for them, one stack is working finely and the other is not calendering out to its full width. The fact that we have just ground both of these stacks in our shop, and with perhaps if anything unusual care, makes us feel when we instructed our men to go to the mill to remedy one stack, that he would find the vertical line of rolls not quite accurate, due possibly to wear in the journal boxes, or from the fact that possibly the mill men had re-babbitted these boxes and were not strictly careful enough to see that when they did so, the rolls were stacked up one upon another in a perfectly vertical line. If rolls in a stack are not in perfect alignment, vertically, they will not calender properly out towards the edges of the sheet of paper. You can try this effect very readily yourselves with two lead pencils. Place them together, one over the other exactly, and they will touch throughout their length, but begin to cross one on top of the other, a little bit out of line, and then a little more out of line, and so on, and you will soon see that they are touching hard in the middle and less and less towards the ends until if you cross them enough the ends will not touch each other at all. Neither will calender rolls in this condition calender properly the edges of the paper.

A stack of calender rolls may look at a glance to be all in good positions, but will they prove to be so when a careful erector knows how to use and does use a steel straight edge and a fine plumb bob and a line on them? In fact, we might go a little further and say that it is just this skill and knowledge of an expert erector who can erect a whole paper machine and have it move off and make merchantable paper the first day, as compared with a less skilled man who may put together the thousands of pieces of a paper machine until it really does look like a machine, and yet will require weeks of adjusting and misadjusting before it will successfully make the delicate and sensitive fabric, called a web of paper.

CAPITAL ADVICE.

The Chemist has no E Z life,
And if he would X L,
He must get all the A D can,
R E cannot do well.

He will become a C D man,
And oft be called A J,
Unless he gets what L P can,
Obtained in N E way.

So if he fondly hopes 2 B
Successful ere he die;
In K C he wants to stand with men
Who R A counted high.

Let him work hard and take A Q,
B E so very wise,
If every D D does is right,
He surely must R I's.

Let him keep B Z every day,
And C K task to do,
Or LC cannot hope 2 C
The N D has in view.

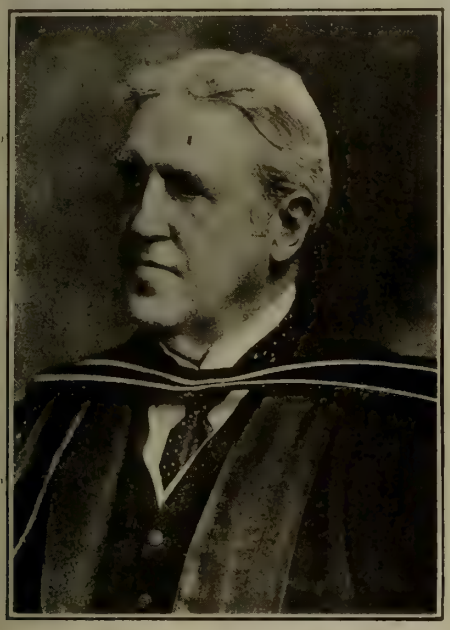
Wm. H. Woodwell, in
The Chemist-Analyst.

Convention of Anglo-Saxon Chemists

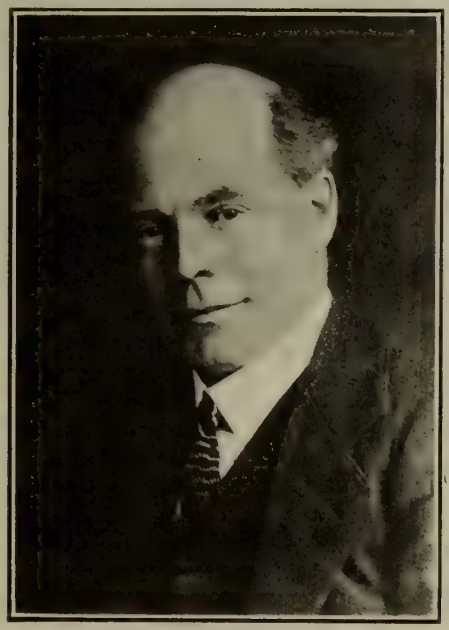
Final arrangements have been made for the Annual Meeting of the Society of Chemical Industry to be held in Montreal during the week of August 29th. On this, the first occasion on which the Annual Meeting of the parent society of Great Britain has been held in Canada, many of the most eminent chemists of the world will be gathered together.

The over seas delegation will be headed by Sir William Pope D.Sc., F.R.S., K.B.E., etc. Sir William Pope, president of the Society of Chemical Industry, was born in 1870 and after graduation was associated with the Manchester Gas Corporation as chief chemist for a number of years. From 1905 to 1908 he was professor of chemistry at Manchester University, since when he has been head of the department of chemistry at Cambridge. Sir William's work has been largely along the lines of Optical Activity and he is credited with the discovery of the relation between Crystal Form and Chemical Constitution. More recently he has been prominent in the public eye in connection with his most valuable work on the preparation of Mustard Gas. His researches on this product enabled the British Government enormously to increase production of this weapon in the late war. In 1919 Sir William was created Knight of the British Empire.

Other prominent figures of the party include Dr. Louis A. Jordan, Chevalier of the Crown of Italy, F.I.C., A.R.C.Sc., etc., whose work as a member of the British Mission on explosives to the Italian government is well known; Dr. Andrew Smith, Managing Director



DR. R. F. RUTTAN.



MR. FREDERIC WILLIAM GAMBLE.



DR. LOUIS A. JORDAN.



DR. W. H. NICHOLS.



MR. C. S. GARLAND.



CAPT. J. C. GOODWIN.

of the firm of Leech, Neal and Co. Limited; Dr. C. J. Goodwin of the firm of Oscra Goodwin and Sons, explosives engineers.

Dr. Frederick William Atack whose principal work has been the Chemistry of Dyes, and to whom we are indebted for the excellent translation of Professor Wahl's "Manufacture of Organic Dye Stuffs," will also be present. Dr. Atack also organized the publication of the Chemists Year Book, which is now in its sixth edition.

The Steel industry will be represnted by Dr. Andrew McWilliams C.B.E., A.R.S.M., whose experience in the management of steel works coupled with scientific researches have earned him a notable reputation among steel metallurgists.

Dr. C. S. Garland the pioneer manufacturer of Thorium Nitrate will also be a visitor.

Dr. Frederic William Gamble, director of Allen and Hanbury's Limited and Professor J. W. McBain are accompanying the party.

Among the notable visitors from the United States will be Dr. W. A. Noyes, professor of chemistry of the university of Illinois and past President of the American Chemical Society; Dr. Charles Herty, Editor of Industrial and Engineering Chemistry; Dr. W. H. Nichols president of the Allied Chemical and Dye Corporation.

There will be a general gathering of chemists from every portion of the Dominion of Canada.

The principal feature of the opening session will be the address of the retiring president Sir William Pope, which will be followed by the introduction of the President elect, Dr. R. F. Ruttan.

The succeeding two days will be confined to technical papers and discussion at both the morning and afternoon sessions with special attention to the Pulp



PROF. J. W. McBAIN.



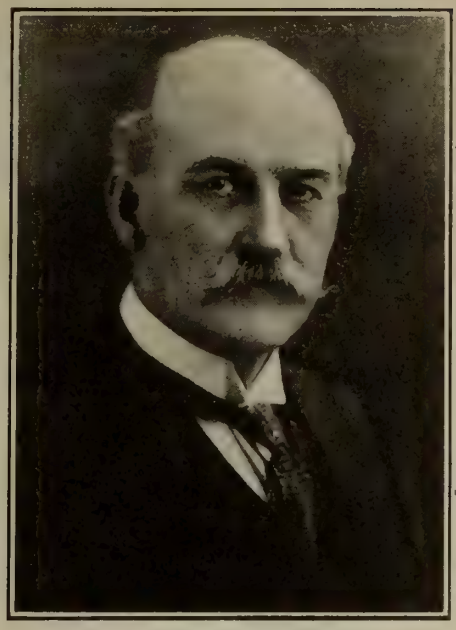
MR. C. A. HAZEN.



DR. FREDERICK WILLIAM ATACK.



DR. MILTON L. HERSEY.



DR. ANDREW McWILLIAM.

and Paper Industry on Tuesday.

The annual banquet of the Society will be held at the Windsor Hotel on the evening of Tuesday August thirtieth. Speeches will be given by leaders in government, scientific, and commercial circles.

The Montreal program will conclude with a special convocation at McGill University, followed by a garden party which will be given by the ladies of Montreal.

On leaving Montreal the visitors will be the guests of the Shawinigan Section of the Society, where every facility will be afforded them for the inspection of the many interesting industries which have grouped themselves around Shawinigan Power development.

From Shawinigan Falls the party will proceed to Ottawa thus gining the Ottawa chemists opportunity of ading their welcome.

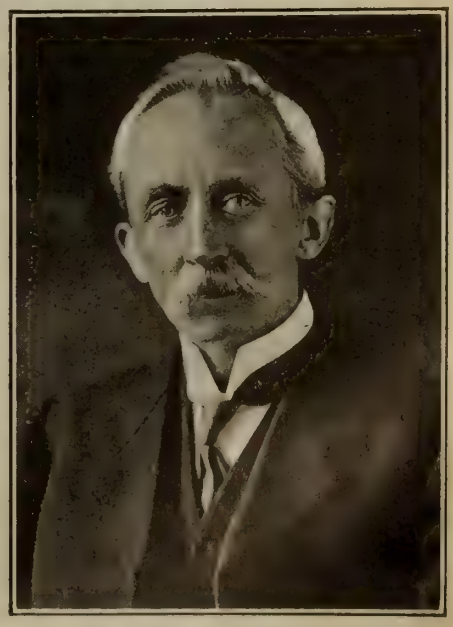
Leaving Ottawa Friday night the guests will arrive at Toronto the following morning where the itinerary will include a visit to the Canadian National Exhibition. An opportunity for rest will be afforded during Sunday at Niagara, followed by inspection of plants around the Falls. At noon on Monday the party will cross the International Bridge and become the guests of the American Chemical Society, who have arranged a most excellent program, including visits to Buffalo and Syracuse, and to New York via the night line down the Hudson River. At New York opportunity will be afforded them of meeting the members of the New York Section of the Society of Chemical Industry. The guests will then be privileged to attend the annual meeting of the American Chemical Society the banquet of which will be held on Friday evening. The following two days will be devoted to sight seeing and such rest as may be thought desirable to enable the visitors to enjoy the National Exposition of Chemical Industries during the week of September twelfth. This expo-



MR. H. W. MATHESON.



MR. ANDREW SMITH.



MR. THEO. H. WARDLEWORTH.

sition is unique and forms a fitting climax to the tour.

The Montreal programme is as follows:—

PROGRAM OF THE ANNUAL MEETING OF THE SOCIETY OF CHEMICAL INDUSTRY AT MONTREAL AUG. 29 to 31, 1921.

Monday, Aug. 29th.

Morning—

9-10 a.m.—Registration.

10 a.m.—Council meeting at McGill University.

11 a.m.—Annual meeting.

a. Address of Welcome.

b. Reply.

c. General Business of the Society. Annual Address. Sir William Pope.

Afternoon—

1 p.m.—Lunch at Ritz Hotel, given by Montreal Section.

3 p.m.—Special visit to Macdonald College, tea and garden party.

Evening—Private Dinners.

Tuesday, Aug. 30th.

Morning—

10—10 : 30.—a. Address—Dr. Lash Miller.

10 : 30— 1.—b. Paper on "The Problems Encountered in the Development of the High Speed Paper Machines at the Laurentide Co. and their Solution"—Mr. Geo. D. Kilberry.

c. Solubility of Cellulose in Thiocyanates.

d. Moving Picture of Wood Operations and the Manufacture of Paper at Price Bros. Paper Mill.

Afternoon—

1 p.m.—Luncheon at Windsor Hotel, given by the Montreal Section.

3 p.m.—Paper on Manufacture of Hydrogen Peroxide,—Dr. Otto Maass.

Peat.—Dr. E. P. Moore.

Lignite Briquetting.—Mr. Leslie R. Thompson.

Evening—

7 : 30 p.m.—Banquet at Windsor Hotel. Speeches.

Wednesday, Aug. 31st.

Morning—

10 a.m.—Papers.

Heat Intercepting Glasses. Dr. Gelert Alleman.

The manufacture of C. P. Chemicals at the Eastman Kodak Co. by Dr. C. E. K. Mees.

Rubber Resins—Dr. G. S. Whitby.

Afternoon—

1 p.m.—Luncheon at Windsor Hotel given by Montreal Section.

3 p.m.—Special Convocation at McGill and Garden Party.

Evening—

7 p.m.—Private Dinners.

11 : 55 p.m.—Leaving for Shawinigan Falls.

A general announcement has just been received of the third International Samples Fair at Prague, Czechoslovakia, Sept. 1-8. Paper will be an important article among the exhibits, as Czechoslavakia embraces 65% of the pulp and paper industry of what was Austro-Hungary.

BRITISH TRADE NEWS.

London, Aug. 2, 1921.—There is a plentiful supply of coal now in the British mills, both Canadian and local and the order is "full steam ahead" as the orders roll in. Unfortunately, however, trade is very dull, small orders are being received, and attention is mostly directed to the export trade, the home consumption being reduced to a nicety. On the other hand supplies from the continent continue to arrive in bulky quantities.

Wages Question.

It is officially announced that the wages dispute in the paper industry is now definitely settled with the acceptance by the Unions of the recommendations made by the Joint Industrial Council. Everything now depends on the rise and cost of living for future arrangements. Credit, however, must be given to the Papermakers' Federation for the democratic and intelligent way they handled negotiations with the workers, an example which might well be followed by other industries.

Felt the Depression.

Much pleasure was expressed at the presence of Mr. Frank Lloyd, the chairman of Edward Lloyd, Ltd., who presided at the annual meeting the other day. He is not often seen in London, but whenever he is his presence is gladly welcomed wherever he goes. Speaking to the directors and shareholders, Mr. Lloyd said they all knew that the present time was a bad one for British trade generally, and the paper trade was feeling the result of the severe depression as acutely as most others. Under the circumstances, the directors did not feel that it would be prudent to recommend a further distribution of more than 1¼ per cent. on the ordinary shares, making a total of 5 per cent. for the year. With regard to, 1921, the prospects were far from encouraging, the consumption of paper of all kinds having fallen off to an unparalleled extent and the protracted coal strike had the effect of still further curtailing the demand. In common with other industries they were feeling the effects of the abnormal and varying rates of exchanges and also the reduced demand for paper in consequence of the consumption by publishers of the heavy stocks they held at the close of 1920. These stocks had now been brought down to a low level, and there were signs of revival in the near future. Then added Mr. Lloyd: "Owing to our conservative policy in the past, we have confidence in the company emerging in a strong position, and as soon as the foreign exchanges have become stabilized, being able to meet competition from all sources as we have done in the past. During the past year the men have settled down to the 3-shift system, and we have no doubt we shall soon make good the ground we have lost during the war compared with countries which were not so deeply affected as we were."

The Pulp Trade.

Since the conclusion of the coal strike and more settled conditions in the labor market, a notable improvement is recorded in the business in pulp. Some large supplies of groundwood and unbleached sulphite are arriving from Canada and Sweden has also come to the fore with good shipments. As things stand at present the outlook is very promising, but it must be remembered there are still large stocks in the British mills to be worked off, these having accumulated owing to the recent strike and decreased demand for paper.

Prices are nominally as follows: Bleached sulphite £22.10; Easy Bleaching No. 1 £19; Sulphite newsprint quality, £17; Unbleached Soda £21; Soda Kraft £18, groundwood (wet) £5; groundwood (dry) £9.



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INQUIRIES SOLICITED :

NEW YORK MARKETS.

New York, August 13.—(Special Correspondence).—Current activity in the paper trade continues mainly of routine character. There is no great expansion of demand for any one grade of paper or paper board though it can be said that business is looking up rather than sliding backward. Consumers are still buying principally in hand-to-mouth volume, showing little disposition to increase operations while matters in their own trades are slow, and jobbers are placing orders for paper with mills only when in immediate need of supplies with which to fill commitments. Some paper mills in the States are running at no better than 50 per cent of capacity, but on an average production is at a larger rate than this. Nearer 75 per cent of full capacity is generally considered as closer to the approximate basis of operations today, and signs are not wanting that as the summer season draws to an end and the usual autumn stimulation of business makes itself felt paper manufacturers will find enough to do to warrant greater production. In fact, a majority in the trade anticipate a marked revival of activity within the next month. August is expected to be the last month of dullness, with a gradual though steady and healthy pick-up in business looked for to begin in September.

Further recession in prices on kraft wrapping paper has been recorded. Purchases of No. 1 domestic kraft are reported by New York jobbers at 5.50 cents per pound f.o.b. mills, while even those manufacturers situated near to consuming points are said to be accepting orders freely at 6 cents. The decline in kraft paper prices is considered as a direct outcome of the sharp drop in kraft pulp costs, thus enabling manufacturers to produce kraft paper at cheaper prices. When it is considered that No. 1 kraft pulp has been bought at 2 cents per pound it will be seen that converters of the raw material so bought into finished paper are afforded a fair margin for profit even at 5.50 cents a pound for kraft paper.

Persistent rumors to the effect that the contract basis will be reduced for the final quarter of the year have a weakening influence on the newsprint market notwithstanding that such figures as are available show the industry to be in a strong statistical position. Yesterday local newspapers printed telegraph reports from Montreal stating that while nothing definite had been given out concerning the negotiations going on there among newsprint manufacturers it was understood on high official authority that the export price in Canada for the last quarter of 1921 will be 4 cents per pound or $80 a ton a decrease of $15 per ton from the third quarter rate . Such reports obviously cause publishers to hold off in entering commitments unless urgently in need of paper and the buying done at present is almost solely to fill immediate wants. It is stated on good authority that consumption of newsprint in the United States is showing only a negligible decline from 1920. It is estimated that publishers are using within 4 per cent of amounts consumed last year, and some are said to be drawing on their own stocks held in warehouses, which were abnormally large, and for this reason production here and in Canada has not been keeping pace with consumption.

(A careful inquiry shows that the above mentioned reports regarding price are, to say the least, premature, if not indeed, entirely erroneous.—Ed.)

Importation of German and Scandinavian newsprint also is depressing prices to an extent. Print paper from these sources is said to be coming into the States, according to late figures, at the rate of about 120,000 tons annually. This is equal to about one-tenth of the country's 1920 production and about 6 per cent of the present consumption. Foreign newsprint is reported to have been offered as low as $70 per ton in small lots in the local market, while offers of large tonnage are reported at $80.

The fine paper branch of the industry is dull. Demand is chiefly for small quantities ,and competition among mills for such business as is to be had makes for weakness in prices. Low-grade wood bond papers are offered down to 8.50 cents per pound at mills, while a fairly fine quality of sulphite bond is to be had freely at 11 to 12 cents. Tissues continue to be one of the brightest spots in the trade. There is a steady call for fine tissue, though of limited proportions, and coarse grades are moving in good volume. Mills making tissue towels and napkins are reported operating at close to maximum capacity and to be readily finding an outlet for their output.

Book papers show little change. Machine finished book is quoted at a range of 6 to 6.75 cents per pound f.o.b. mills, depending on the quality of the paper concerned and the tonnage wanted. Some manufacturers name a differential of but one-quarter of a cent per pound on super book, while in out of the way cases it is said mills are quoting super at the same level as machine finished book.

Quotations on board display a stiffening tendency. As an instance, one of the leading mills in the East this week withdrew all prices and is temporarily out of the market, and it is expected that when the mill in question again issues quotations they will be at a considerable advance over the figures at which it has recently accepted orders. Board prices have worked down to a

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St. John, N.B. Canada.

point where there is small room for profit for the manufacturer, and it is presumed that steps are being taken to strengthen the market. Present prices run at around $28 per ton f.o.b. New York on plain chip and between $30 and $32.50 on news board.

GROUND WOOD.—A steady tone marks quotations on ground wood and the tendency is decidedly in an upward direction. In fact, information has been received of several domestic grinders boosting quotations on freshly ground pulp from $28 and $30 a ton up to $32 at the grinding mill, and the market seems headed for a level of $40 a ton delivered consuming point. Even stored ground wood has been sold this week at $35 delivered, which indicates the undercurrent of strength in prices. Newsprint mills are reported absorbing fair tonnages of mechanical pulp, and board manufacturers are said to be buying in moderate volume, which, in conjunction with a good many grinding mills closing down because of low water, makes for a firm market condition. Producers are cautious about entering future commitments and are mostly refusing to book orders calling for deliveries more than a month off.

CHEMICAL PULP.—Offerings of pulp from European sources at surprisingly low prices, and the switching of buying by consumers from domestic to imported pulp, have placed the domestic chemical pulp market in a condition bordering onto demoralization. Producers in the States are generally refusing to endeavor to compete with foreign pulp at the prices the imported product is being offered at present, it being their contention that they cannot possibly manufacture either sulphite or kraft at such figures with a profit for themselves. Prices on domestic pulps consequently are largely nominal. No one seems to know what constitutes the market basis or what can be actually obtained for the different grades. Opinion in the trade is that Swedish producers are simply liquidating surplus stocks of sulphite and kraft, being obliged to do so because of their financial position, and that they are shipping pulp to America to be sold at prices which represent a heavy loss to themselves. Reports from the other side say that upwards of 40 mills in Sweden have shut down, and this leads members of the pulp trade here to believe that as soon as surplus holdings are removed the situation abroad will change considerably for the better.

It is reported that a large tonnage—approximating 1,000 tons—of No. 1 Scandinavian kraft pulp was sold several days ago at 2 cents per pound ex the dock at an American port. This price is doubtless an exception, but foreign kraft is freely available in moderate-sized lots at 2.25 cents. Foreign bleached sulphite is selling here at 4 cents and No. 1 unbleached sulphite at as low as 2.50 cents.

PAPER STOCK.—With old paper prices on a low level, where in most instances, dealers say, there is no profit in collecting and sorting stock, most packing concerns are reducing operations to a minimum, and available supplies are growing so light that the scarcity is commencing to have influence on prices notwithstanding that consumers are buying in small volume. This situation is particularly observable in soft white shavings, white blank news cuttings, books and magazines, and several of the bulky grades such as mixed papers and folded newspapers, and dealers assert that it is becoming quite difficult to locate sizeable stocks of these grades.

OLD ROPE AND BAGGING.—Old rope is quotably steady at about 4 cents a pound at shipping points for domestic manila rope in No. 1 condition, with importers reporting sales of foreign rope at a quarter of a cent under the domestic basis. Old bagging continues in a dull market position and is mainly nominal in price at around 75 cents per hundred for No. 1 scrap bagging.

MOTOR HAULING CUTS WOOD OPERATING COSTS.

The day of the horse is passing in the logging camps. The cost records of the horse compared with the records of the motor vehicle in several recent carefully checked tests, show that the use of power equipment cuts the cost of log hauling as high as 70 percent.

These figures were presented by practical woodsmen during the recent convention of the Woodlands Section of the American Paper and Pulp Association, who have been forced to substitute power operations for animal hauling by the far greater economy of the motor hauler.

The figures given by these operators apply equally well to lumber operations as to woods camps of the paper industry, for the hauling problem is identical in both types of cuttings.

O. L. E. Weber, of the Watab Paper Company, Sartell, Minn., told of extensive use last winter of tractors, under conditions where horses could not be used at times, but he made his comparison of costs on the basis of horse equipment on passable roads. He figured that a 10-ton tractor would do the work of 36 horses, and a 5-ton machine of 15 horses. He made his cost comparison on the basis of 5,000 cords of pulp wood, 35,000 tamarack and cedar ties, 30,000 cedar posts, and 750,000 feet of Norway pine where he actually used tractors, but where he estimated the cost of horse operation under conditions of previous years. The cost of the job with tractors was actually $3,150. The cost with horses would have been $10,100, including cost of equipment in both cases.

Stanley H. Sisson, of the Racquette River Paper Company, operating in Northern New York, told of hauling 23,000 cords of 16-foot peeled wood 10 to 12 miles, an average of 65½ cords per day per tractor, handling 15,000 cords in 38 days. His comparison with horse equipment was as follows: One team hauling 9 cords per trip, double headers at landings, costing $15.50 per day, or $1.72 per cord. The tractor cost, on a basis of 60 cords, with two trips daily to landings, was $43.06 per day, or $.717 per cord. He, like the other wood superintendents, said that care in repairs and maintenance of tractors was vital to their successful operation, and also urged care in dispatching trains of sleds or wagons, with extra equipment being loaded or unloaded while the machine was on the road.

C. L. Tolles of the Phoenix Manufacturing Company of Eau Claire, Wis., giving figures for a steam hauler, with long trains of sleighs, said that the motorized cost was only about one quarter that of horse operations.

A. E. Drott, of Drott & Newall, handling another Wisconsin logging operation said his motor hauling cost him $1.50 per thousand feet of lumber, board measure while natives using horses were forced to pay $10, and then failed to get all their timber out. This was on a 10½ mile haul, and on a 7½ mile haul, the motor equipment cost $1 per thousand, as against $7 for horse hauls.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., August 25th, 1921. No. 34

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

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Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

Subscription to any address in Canada, United States and British Empire, $5.00 yearly. Other Countries Postage Extra. Single copies, 15 cents.

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EDITORIAL

SCHOOL DAYS.

Just mention school to the first twelve year old you see and notice the happy smiles that fail to appear, yet if you mention school days to the average grown-up you immediately call to mind a host of happy memories as well as, in most cases, a realization of many lost opportunities. School days were happy days for all of us, but in most cases the pleasant features were associated with activities outside of the school room. Happily, educators of the present day have come to a realization of the need for making school work attractive in order that it may be efficient. This is by no means an easy problem and it is fortunate that it is now receiving belated attention from many prominent educators who have not only had years of experience in teaching young people but who have also a vision of what the school room can and should be.

Among industrial concerns whose leaders appreciate the value of trained minds even for common tasks, the pulp and paper industry is prominently active. In most of the communities where pulp and paper mills are located this industry is the most important industrial activity. The failure, or at least the difficulty, of instituting improvements, and of calling forth suggestions for improvements, can be traced directly to lack of thought and difficulty of self expression. Perhaps fully as important is the often discouraging list of accidents, many of them are due to inability to read warnings and directions and when this is not the case it is due to thoughtlessness. Education, if not a cure-all, is the best known remedy for these troubles.

The most serious obstacle to the advancement of employees, whether in the mill or the office, is unquestionably lack of education. This results oftentimes in the necessity for a mill to look elsewhere for men to fill positions of relative importance. One of the principal reasons why the employees in the mill have not had sufficient education to qualify them for advancement is that they have found the school room dull and the instruction uninteresting.

The question is largely in the hands of the management of a paper mill if the local school is to be made sufficiently attractive to keep the children not only within its walls but actively at their work until they have received at least the fundamentals of an education that will be of real service when they go to work. The public school of a paper mill town should be one of the most interesting affairs that could be imagined. There is no phase of life that is not somehow touched and served by the product of the mill. There is no more fascinating series of miraculous changes than those which take place in the conversion of towering forest and tumbling waters into the delicate white sheet of note paper, the common paper bag, the every-day newspaper, or the paper box which every child sees every day. Most of these operations are going on within sight of the school house and yet in many cases the mill is known to the children only as the big building behind the closed gates where, perhaps, father or brother works during the day but about which the child has only a vague idea. The teachers, too, often have the haziest notion of the wonderful transformations that are accomplished by the town's principal industry. A little attention on the part of the plant engineer or superintendent would change the whole aspect of the teacher's job from a monotonous repetition of multiplication tables and spelling lessons into an active and vital contribution to the fitting of pupils for and into the great work of earning a livelihood and a life of service. An intelligent teacher will not find it difficult to comprehend the underlying principles of the manufacture of pulp and paper and frequent observation through visiting the mill with its many very ordinary problems of mathematics, physics, chemistry, electricity and mechanics that come up from day to day would furnish an unlimited store of interesting points of contact between the every day lesson in the school room and the every day work in the mill.

The editor had the pleasure of representing the industry on a committee which was formed to encourage the socializing, if we may use that work without being accused of Bolshevism, the education of children and the object of the committee's work has been to encourage such changes in educational methods as would impress on the student the importance of the community and the obligation of each member of the community to work for the common good, to appreciate the honor of being a Canadian citizen and to understand not only his rights and privileges but his duty to serve in every way possible his country, province and town. It is little more than an attempt to incorporate what might be called an educational version of the Golden Rule into the ordinary presentation of ordinary lessons and to tie them up with the every day life of the community. Children are fascinated with activity and if the work in the school room can be shown to contribute to the efficiency necessary to carry on the town's business and the mill's business then it is going to be vastly easier to train the minds of

the children in such a way that they will contribute in a far greater measure to the industrial and social welfare, not only of the community that trains them, but to the country at large.

The Pulp & Paper Association has realized the need for text books which, in a measure at least, would assist in bridging the gap between the ordinary subjects of study and the interesting activities of the mill which, unfortunately in many cases, lure the student all too soon from his desk and text book to what, for the time, seems the more attractive position at the machine or in the office. Education should be attractive and serviceable, should connect the boy and his work. This realization has resulted in the appropriation of a generous fund by the pulp and paper industry for the preparation of a set of text books which cover not only the manufacturing process but the fundamental preliminary instruction in mathematics and elementary science. Illustrations and examples are taken wherever possible from the actual paper mill experience of the authors and the editor. The first two volumes, which will include preliminary work are now on sale and are being distributed in Canada through the Pulp & Paper Magazine. Volume 3 is practically ready for the printer and should be in book form in a few months. Readers of the Magazine and management of mills in pulp and paper communities will do well to look into the peculiar advantages of basing the school work on these texts. They are equally as well adapted for the those who want to study at home.

CHEMISTRY IN CANADA.

From $1,677,216 to $17,053,074, an increase of more than 1,000 per cent, tells the story of the growth of the various chemical industries in Canada from 1912 to 1919. These figures are the value of exports. Imports at the same time grew from $12,595,851 to $32,788,704. Growth has been most rapid during the war period, but many of the plants erected during the past 7 years make peace time products.

Canadian chemistry has great possibilities, especially along electro-chemical and the closely associated electro-metallurgical lines. With vast water-powers and extensive deposits of minerals, Canada is in a strategic position. Chemical industry is likely to have national characteristics, as is the case with the pulp and paper industry. There is a great new channel to be dug by the two in the utilization of waste sulphite liquor. In this connection it is barely possible that some day the government mill see the good of duty-free industrial alcohol, which can be made from the waste liquor, and which, no doubt, would be largely used as a basis for new industries whose products would largely supply the home market with that $33,000,000 of imported chemical material.

Standing at the door of such a future, it is very fitting that Canada should be honored as the place for the annual meeting of the Society of Chemical Industry, and that our eminent chemist, Dr. R. F. Ruttan, should be the president during the next three years. We are sure they will be significant ones in the history of the Society and in the development of Canadian chemistry.

COBWEBS.

It is pleasant to note the rapid growth of our contemporary, Le Papier. Publication was discontinued during the war, but recovery seems quite complete. There are always some excellent articles.

A man in Fort William was electrocuted climbing a pole for a cat. That's a new one. We thought pole cats killed by asphyxiation.

A newspaper despatch from Ottawa says the Union locals are awaiting information from headquarters regarding the recent decision of the Association of American and Canadian Pulp and Paper Manufacturers to lower wages. The inference is incorrect as the associations did not act in this matter.

The Hon. Mr. A. David was quite correct in stating that the export in the raw state of our natural resources is commercial suicide. He is not quite correct in assuming that the whole difference between the value of the raw wood and of the finished paper is wages—mills must be built, machinery installed, coal bought, and insurance and interest paid.

There seem to be hints of a general election in Cananada this Fall. Good. That means more news and more newsprint.

The population of Thorold, Ont., has more than doubled in the last ten years.

Alongside the lament that the U. S. Emergency Tariff is ruining our grain trade is the report that more wheat was exported in June and July than in the same months last year.

Consideration of the effect of the U. S. tariff on our decreased general exports to that country should not disregard the general condition there that materials are not wanted as they were a year ago.

A "T" FOR A "D"

We are told that it is wrong to take "an eye for an eye"; it is equally wrong to put a **D** for a **T**, at least chemically. This error is frequently made in writing **sulphide** where **sulphite** is intended. Three atoms of oxygen may not seem much, but it represents a vast change of chemical character.

Moisture Contents of Paper During Formation

By JAY SEE.

In reply to a question to the editor on this subject, an expert on paper machines has kindly given the following helpful information.—Ed.

In the manufacturing of paper it is often desirable to know the percentage of fibre that is carried as the web of paper is forming on the Fourdrinier toble at different points during the travel of the wire, and the percentage of dryness of the formed web of paper as it passes over the machine. The proper amount of water from the flow box to the first suction box must be maintained for, as the stock leaves the slice, the character of the sheet, or web of paper depends on the moisture or water carried as this affects the felting of the fibers. An important factor is the diameter of the table rolls, and the distances between them. A properly formed sheet will press without crushing, and when reaching the dryer unit of the machine, will permit the moisture contents to be easily evaporated, without cockling or the making of broke.

To determine the proper percentage of fibers at the Fourdrinier table, a careful survey was made of the moisture content, on a newsprint machine manufacturing standard news, the composition of the paper being 23 per cent sulphite, 75 per cent groundwood and 2 per cent loading, and operating at a speed of 634 feet per minute and giving an actual daily production of 57¼ tons of newsprint. The wire was 158'' wide by 70' long with a pitch of 27 inches. The Fourdrinier table was constructed in the following manner: breast roll 22'' diameter, 160'' face; table rolls 5½'' diameter by 160'' face, spaced 6¼'' apart for the first ten rolls, and the balance space 6½'' on centers; seven suction boxes, arranged two in front of the dandy roll and five after the dandy roll; the dandy roll was 12'' diamter by 160'' face and wound with 70 mesh wire; the bottom couch roll was 28'' diameter by 162'' face, and the top couch roll was 26'' diameter by 166'' face.

The press part of the machine consisted of three presses, paper traveling forward through first and second presses and reversing at the third press. Each press was arranged for a felt 52 feet 6 inches long. The bottom press rolls were 24'' diameter by 158'' face ¾'' rubber covered and crowned .035''. The top rolls for first and second presses were of wood, 26'' diameter by 162'' face, and crowned .018''. The top roll for third press was 24'' diameter by 162'' face ⅝'' gun metal jacket, and ground perfectly straight.

The paper made was pressed perfectly and dried evenly and showed perfect tests in every way, therefore, the factors involved in the formation of the sheet demonstrated perfect arrangement of the felting of fibers at Fourdrinier table. To determine actual conditions a test for percentage of fiber and water was taken at different points along the machine from flow box to dryer unit; the test of moisture from slices to first suction box was somewhat uncertain but a fair working knowledge was obtained of the proper moisture content to be maintained for proper formation. The results arrived at are as follows:

Stock at flow box, 1 per cent fiber, 99 per cent water.

Stock leaving slice, 2 per cent fibre, 98 per cent water.

At fifth table roll from slice, 4½ per cent fiber, 95½ per cent water.

At tenth table roll, 5½ per cent fiber 94½ per cent water.

At fifteenth table roll, 6¼ per cent fibre 93¾ per cent water.

Before reaching first suction box, 7 per cent fibre 93 per cent water.

At the dandy roll, 14 per cent fibre 86 per cent water.

After leaving last suction box, 19¾ per cent fibre 80¼ per cent water.

After leaving nip of couch rolls, 28½ per cent fibre 71½ per cent water.

After leaving first press, 32¼ per cent fibre 67¾ per cent water.

After leaving second press, 36⅜ per cent fibre 63⅝ per cent water.

After leaving third press and before reaching dryers, 39¼ per cent fibre 60¾ per cent water.

The dryer unit consisted of one 24'' diameter receiving dryer, forty 48'' diameter paper dryers, and four 48'' diameter felt dryers. The dryer unit was equipped with two bottom and two top dryer felts. The last top dryer and the last bottom dryer were used as cooling dryers.

The finished paper was of good character, even formation even thickness, calendered perfectly, and wound into perfect shipping rolls.

NOTE:—Other authorities mention less fiber at the couch and the dryers, but we have no statements that give, at the same time, mechanical particulars.—Ed.

WATER IN PAPER; ANOTHER REPLY.

Mr. John W. Brassington, of the Port Arthur Shipbuilding Co., sends the following:

Some years ago I had occasion to make a series of tests to ascertain the distribution of water on a Fourdrinier paper machine, the results of which may be of interest to others in the trade.

The amount of water used with the prepared pulp from the beating engines as the mixture runs on to the wire varies according to the character of the stock and of the paper to be made; but I have found this variation to fall within certain limits for the same class of paper manufactured, provided the machineman is skilled in his work and uses good judgment in regulating it.

The following results were obtained while manufacturing an ordinary machine finished printing paper, the fibrous stock for which consisted of sulphite pulp, ground wood, and a proportion of esparto pulp, about 15 per cent. The mineral matter in the paper consisted of china clay. The wire on the machine measured 66 inches wide by 30 feet long and was capable of yielding a web of paper measuring 58 inches wide at the reel. The weight of paper made during the tests was 21 lb. double crown (20'' x 30'') 80 sheets to the ream, equivalent to about 30 lbs. double demy.

The amount of dry paper stock in the beating engines varies from 3¼ to 4¼ pounds per cubic foot, in accordance with the kind of paper to be made and the amount of mineral loading used. It reaches its

maximum in the production of papers such as "imitation art," which are heavily loaded with clay.

In this particular case the solid contents (i. e., fibre and mineral matter), in the stuff chest gave on an average of several determinations 1.808 pounds per foot, and when these solid contents were dried at 105 deg. Centigrade they gave 12.8 per cent of mineral matter. The amount of water and total solids pumped into the regulation box was therefore, nearly 1,106 cubic feet, equal to 6,885 imperial gallons, per ton of paper stock.

The paper stock, as it leaves the regulating box, is mixed with the "back" or "white" water from the machine prior to its passage over the sand traps and through the screens, any deficiency in the volume required being made up from the mill supply.

It was found that the mixture flowing on to the wire contained 0.575 pounds of total solids per cubic foot containing 21.5 per cent of mineral matter, whilst that passing through the wire cloth into "save all" below contained 0.227 pound of total solids per cubic foot with 50.2 per cent mineral water. The amount of dilution that took place in the mixing box was therefore, nearly 3½ times the volume of the paper stock from the stuff chest, or to nearly 22,000 imperial gallons reckoned on one ton (2,000 lbs.) of dry paper stock.

It was difficult to ascertain the volume of this "save all" water accurately, but the writer is of the opinion that it represents about one-half of the total on the machine. When it is mixed with the wash water from the spray pipes, etc., it is pumped to the separating vessel, there to be treated as above described.

The overflow from this separating vessel, which ran to waste, contained 0.064 of a pound of solids, total, per cubic foot, of which 96.3 per cent was mineral water. As this mineral matter consisted almost entirely of china clay, when determining it by ignition, due allowance was made for the combined water in the clay. The volume passing away or lost was small, as the bulk of it was used for filling and emptying the beating engines. Obviously the loss of fibre from this source was negligible.

It would appear therefore, that the amount of water run on to the wire cloth of the paper machine per ton of paper was in the neighborhood of 7,000 imperial gallons, and that the bulk of the fibre and clay passing through the wire as well as that gathered from other sources, was returned to the mixing box of the machine. In point of fact this fibre and clay represents a circulating quantity and when once its flow is adjusted, has not any material influence on the weight of paper, this being regulated by the stuff valve on the regulation box.

What took place after the web of paper was formed on the wire was ascertained to be as follows:

1. The wet web of paper after passing the suction boxes of which there were two, and before passing under the couch roll, contained 89.8 per cent of water.

2. The water left in the web after passing the couch rolls and before entering the first press rolls was 79.7 per cent.

3. The web finally contained 63.8 per cent water after passing through the first press rolls and before going on to the drying cylinders. This figure represents the amount of water to be evaporated by the drying cylinders and is equivalent to 1.76 tons per ton of paper made.

There were no second press rolls in operation on this machine while these tests were being made, as these rolls were undergoing repairs, but as the machine was narrow, a uniform and good pressure could be obtained with those in action, as shown by the low percentage of water left in the web after passing them.

The writer has found that in many cases where thin sheets of paper are being made, such as the above, there is practically no water removed by the second press rolls that their function is simply to smooth and glaze the under surface of the web of wet paper. A long series of observations extending over many years has established this and also the fact that seldom less than 63 per cent of water is left in the wet web after passing the second pair of press rolls.

It is doubtful, in the writer's opinion, what advantage is to be gained in drying the paper by using a third set of press rolls such as exist on many modern machines. In cases of fast running, adding to the number of presses, a more gradual pressure can be applied with less injury to the web of paper and to the felts, but the final moisture in the paper left for the drying cylinders to evaporate ranges as a rule from 62 to 68 per cent.

The foregoing may be summarized as follows:

Solids, i.e. Mineral and Fibre.

		Water
Mixture going onto wire	0.92	99.08
Before entering couch roll	10.20	89.80
After passing couch roll	20.30	79.70
After passing first press rolls ..	36.20	63.80

In a high speed News machine there is about one-third of one per cent of fibre and solid matter in the stuff as it flows on to the machine at the flow box. Nearly 50 per cent of this moisture is lost on the first half a dozen table rolls, and the first save-all box is designed to take care of this great quantity of water. This leaves about six-tenths of one per cent of solid matter after the first half dozen table rolls.

By the time the paper gets to the first suction box the stuff contains practically about 5 per cent of solid matter, and after passing over the suction boxes contains approximately 10 per cent of solid matter, which is before entering the couch roll. Before it enters the first press roll it contains 20 per cent; before entering the second press roll it contains from 25 to 30 per cent; the third press and the fourth press, if used, at the very best service will hardly reduce the moisture in the paper below 60 per cent. We generally figure on the paper leaving the last press as containing 36 to 37 per cent moisture. Needless to say, care should be taken that paper as it leaves the dry end should contain about 10 per cent moisture and 90 per cent fibre.

Mr. Brassington adds: — You will realize that the question is largely theoretical, because the quantity of water removed at the different points of the paper machine must vary according to the handling of the machine; heavier weights on the first presses will make quite a difference in the relative proportion of moisture at the press points, while the number of table rolls governs the moisture of the paper when it gets to the first suction box, but the equation also contains a symbol expressing the speed of the paper. For instance, I have known of the table rolls being removed on a high speed machine in the summer time, so as to

allow the water to get down closer to the suction box.

As you know, I have often expressed a wish that experiments could be made determining the inter-relationship between the number of table rolls per foot per minute speed at different elevations of the wire for different heights of slice head.

There is no question in my mind that careful experiments along this direction would lead to a very decided indication that a considerable elevation of the flow blox and a sluice way to a level wire, so designed that the stock would strike the wire at a slighter greater speed than the wire is running, would give a much better formed sheet than the present method of elevating the breast roll.

The shake in such a design would be replaced by interference baffles, causing a commingling of the fibre after it flows over the apron.

LESSONS FROM THE DROUGHT.

An Instructive Editorial from The Presbyterian Record Montreal.

Droughts are, more or less, the fault of men, in needlessly destroying the forests.

There are two chief sources of rainfall, ocean and forest. Both have moisture which they give off in vapor and it comes back to earth in rain.

The heat of the sun causes moisture to rise from ocean and seas and lakes, just as the water in a basin will gradually go off in invisible vapor until the basin is dry.

This moisture, rising from the sea, forms clouds, which are simply vapor, like the steam from a kettle. The wind carries these clouds far away over the land and when the particles of moisture come together and get too heavy for the air to hold them up they fall in drops of rain, watering the earth, running into streams and brooks and rivers, back again to the ocean, to rise in vapor, once more.

This change has been going on ever since there was ocean and shore, the earth constantly watered from the sea, and the sea never getting any less, for its waters are ever coming back to it. Its generous givings do their beneficent work on the earth and return to its own bosom again.

The other source of rain is the forest. When a land is wooded there is a deep soft mould under the trees, made up of fallen leaves. This holds the rain, and from it there constantly rises a moisture into the air, which forms into clouds and falls again.

There are thus two continuous circuits by which the world is watered and washed, the shorter circuit from the forest and the longer from the sea. Man has no control over the latter but can modify the former.

When a country is stripped of its forests, it has no deep soft mould, sheltered by the trees, to hold the rain when it falls, so the rain rushes off at once to the nearest stream and on to the sea and soon all is dry again.

No moisture rises because there is none to rise, no clouds, no rain, except what is borne from a distance on the wings of the wind. God's Providence making up in some measure for man's carelessness and neglect.

The recent terrible famine in China, following long continued drought, has been largely owing to the fact that years ago the country was stripped of its forests, and its hills and plains left bleak and bare.

Much of our continent that was once covered with magnificent pine forest, is now bare and barren, unfit for cultivation, and holding no supply of moisture when rain occasionally falls; whereas if it had been conserved, the larger trees taken out from year to year, the smaller left to grow, it would have yielded a perpetual harvest of choice timber and would have been a perennial source of rain supply.

Millions of acres of bare hillside in Canada should today be clothed with forest which would yield a continuous supply of timber and moisture.

One great lesson from the drought is the wisdom and duty of caring for the forests that yet stand, "using them as not abusing them," and the further duty of reforesting the lands not needed for cultivation. Norway has been reforesting for sixty years, and regrets that it had not begun a century earlier.

If the farmers of Canada would take the trouble, at odd hours, to plant seeds or saplings of good trees, oak, ash, walnut, pine, etc., which would need no further care, they would make a better country for those who come after, a satisfaction which is more satisfying than bringing gain to one's self, for the very act of thus living and working for posterity brings its own self-satisfying enoblement.

Another and greater lesson is that in the spiritual realm, drought and barrenness and lack of rainfall are in still greater measure men's own fault.

A COLLECTION OF EXCEPTIONAL PAPERS.

Series IV of "Technical Association Papers" has been issued and mailed to members. This makes a volume of 174 pages and covers. The volume contains verbatim reports of the various group meetings held during the annual convention of T.A.P.P.I., and all of the papers and their discussions are presented in full. The account of the banquet is especially interesting and entertaining. The after-dinner speeches are given in full and it is seldom that a more admirable mingling of grave and gay has been presented. Chemical warfare and the sources of the deadly gases used are described in a speech of great rhetorical ability by Professor Bogert of Columbia University, while Elwood Hendrick, president of the Chemists Club, is represented with a whimsical discourse on odors which he announced as a "Homily on Olfactics." In his inimitable fashion Doctor Hendrick spoke of odors in literature, the mnemonic associations of smell, and the function of smell in insects and animals. The relations of paper and electricity are touched upon by Calvert Townley, assistant to the president of the Westinghouse Electric & Manufacturing Company who, however, did not stick closely to his text and told many stories. Paper's place in our daily life and the appalling situation which would develop if newspapers were abolished, were the subject of an address by Arthur L. Dawe, secretary of the Canadian Pulp and Paper Association.

Technical Education in general was the theme of a speech by Philip T. Dodge, president of the International Paper Company, whose talk is reported in full. Mr. Dodge made a plan for the interchange of technical knowledge and drew a picture of a project he had in mind, for the establishment of a great central college or school for teaching the art of papermaking. It is a thoughtful speech well worth pondering.

Address orders, with remittance, to T. J. Keenan, Secretary, 342 Fourth Ave., New York. The price is $3.

Of all felicities the most charming is that of a firm and gentle friendship. It sweetens all our cares, dispels our sorrows and counsels us in our extremities.

PULP EXPORTS SLIGHTLY BETTER IN JULY.

July returns on exports from Canada of pulp and paper continue to reflect the universal depression existing in the market for these commodities although there are indications that the bottom has been reached, so far as demand if not so far as values is concerned, and that the near future will witness improvement.

The July exports of paper, pulp and pulpwood reached a total value of $9,661,595 as compared with $8,687,504 the preceding month and with $17,560,653 for July 1920. Exports of newsprint paper amounted to 1,146,362 cwts. valued at $5,539,623, compared with 847,604 cwts. valued at $4,295,181 the preceding month and with 1,219,439 cwts. valued at $5,727,193 in July last year.

The chief discrepancy is shown in wood pulp. Exports for July this year amounted to 845.150 cwts. valued at $2,870,401, compared with 648,885 cwts., valued at $2,225,425, the preceding month and with 1,893,461 cwts. valued at $9,137,733 in July, 1920. The details are as follows:

July.		1920.	1921.
Paper	Book	$ 110,596	$ 14,986
	Newsprint	5,727,193	5,539,623
	Other grades	1,039,225	241,546
	Total	$6.877,014	$5,796,155
Pulp	Sulphate	1,383,104	390,068
	Bleached sulphite	1,402,957	515,280
	Unbleached sulphite	3,822,679	990,807
	Groundwood	2,528,993	974,246
		$$9,137,733	$2,870,401

Pulpwood to the extent of 80,835 cords, valued at $995,039, was exported to the United States during the month, compared with 144,741 cords, valued at $1,-545,906 in July, 1920.

Countries of destination were: PAPER — United Kingdom, $81,670; United States, $5,243,134; Other countries, $571,351. WOODPULP—United Kingdom, $1,179,392; United States $1,507,146; other countries, $183,863.

Returns for the four months ending July 31st shows the following:

	1919.	1920.	1921.
Paper	$17,532,409	$26,423,454	$21,354,564
Pulp	9,534,827	26,070,593	8,976,685
Wood	3.260,241	4,061,376	3,704,327
Totals	$30,327,477	$56,555,423	$34,035,576

It will be noticed that despite the subnormal conditions at present prevailing the returns for the first four months of the current year are well in advance of those for the same period in 1919 although very much less than last year.

MORE INCREASES THAN DECREASES.

Commenting on a chart which they prepared showing price tendencies in nine groups of commodities from 1914 to July 1st 1921, Dwight P. Robinson Company, engineers and constructors, say:

"It is now evident that price recessions in many industries have been arrested. During a recent week more price increases than decreases were noted—the reverse of a situation which had existed for 56 consecutive weeks.

"We call your particular attention to the curve for lumber and building materials, which has begun to straighten out. Building materials have taken a deflation of 139 points from their peak, as contrasted with the average deflation for all industries of 124 points, in spite of a more than normal demand for construction material. For the month of January contracts awarded were 6 per cent behind the January five-year average. For the period January to July 1st they were 9½ per cent ahead of the January to July 1st five-year average.

"There is not very much industrial construction going forward. When the large volume of this class of work starts, the increased demand will undoubtedly have a tendency to push building costs up, for the same laws of supply and demand obtain in the construction industry as in other lines, and it is not reasonable to suppose that in the face of such activity there will be an appreciably greater deflation.

"The railroads are now practically assured of government aid and accordingly may soon be in the market for the equipment and materials they have so long needed. Heavy railroad purchases will act as a strong tonic to the business situation and will undoubtedly affect general prices."

SCREENING STRAW PULP.

A short time ago we had occasion to publish an enquiry from a reader of the Pulp and Paper Magazine who desired information on the screening of straw pulp in order to get paper free from knots. Two replies to that enquiry have been received and we are indebted to Mr. John Goodey of Ottawa and the Union Screen Plate Company of Lennoxville., for their replies. The advice received is, in one case, to arrange the stuff inlet so that the stock and water are introduced below the screen plates and agitated in the ordinary way by the plungers and diaphrams and the screened stock passes up through the plates and overflows to the paper machines. This permits dirt and knots to settle out below the plates instead of being gradually forced through them with the good stock. A shower pipe with high pressure water is suggested for keeping the screen plates clean.

Further advice is to the effect that a prolific cause of dirt in stock, also threads, bunches of fibre, etc., is due to roughness on worn plates. It is essential that old plates be properly closed and re-cut or that new plates be used if clean stock is desired.

SWEDISH CELLULOSE MILLS CLOSING.

Stockholm, Tuesday.—In a report issued on the situation in the Hernoesands saw mills district. it is said that many companies are requesting the postponement of payment to the Government for the purchase of timber from the State forests. Saw mills and cellulose mills are obliged to close down, and now, in addition, co-operation between the lumber exporters has broken down and the selling society has been dissolved, so that chaos rules on the market. A few cellulose mills are still running, but it is only a question of days when they will close down and the production be considerably reduced. The lumber yards consequently are packed full of goods, which daily lose in value.—Paris Herald, July 30.

Mr. John F. Ferguson, power specialist, of Holyoke, Mass. has been spending some time in Canada, stopping in Ottawa and Montreal, and spending some time with the Paper mills of the St. Maurice Valley at Grand'Mere, Shawinigan Falls, and Three Rivers.

The Paper Industry and the Pulpwood Supply*

By R. S. KELLOGG Secretary, News Print Service Bureau.

No other method of wood utilization approaches that of pulp and paper manufacture in the completeness with which the raw material is used and no one can set a limit to the number of articles of daily utility that it is possible to manufacture from pulp and paper. These articles will be manufactured in greater quantity and variety as our knowledge increases and as higher values of forest products lead to more scientific utilization of the timber supply.

Pulp and paper manufacturing is the one great industry using wood as a raw material in which there is much hope for the practice of forestry as a commercial undertaking upon privately owned land.

The production of large-size timber is too long an undertaking with too great hazards and too low a rate of return to attract the investor or to appeal to the practical sense of lumber manufacturers. On the other hand, the production of pulpwood of rapid growing species is a matter of much shorter time than the growing of sawtimber, and the amount of capital invested in a pulp and paper mill is so great as to require a long period of return.

Hence it is to the pulp and paper industry that professional foresters of the country turn most hopefully for the practical application of their principles.

The most superficial survey of the situation shows the urgent need of immediate and large scale efforts to provide a permanent supply of raw material for the basic industry of paper manufacture. We have become so accustomed to using paper extravagantly for a multitude of purposes that we do not stop to think that in most cases the piece of paper which we handle carelessly and cast aside is a forest product, and, what is more, a product of a rapidly disappearing type of forest.

To say that the production of wood pulp in the United States last year was 3,800,000 tons does not convey much to the ordinary reader, but the problem begins to take on a more concrete aspect when we say also that more than 6,000,000 cords of wood—chiefly spruce and hemlock—was used to make this quantity of pulp.

The magnitude of the paper industry assumes further proportions when we enumerate the different classes of paper produced last year:

	Tons.
Paper board	2,313,000
Newsprint	1,512,000
Book	1,104,000
Wrapping	832,000
Fine	389,000
Felts, etc.	367,000
Bag	212,000
Other grades	605,000
Total	7,334,000

In addition to this tremendous production of paper in the United States, imports (chiefly newsprint from Canada) amounted to 760,000 tons and exports to but 260,000 tons, making a visible supply in the United States in excess of 7,830,000 tons for the year, or 147 pounds per capita.

It is truly a paper age and even more truly a newspaper age. Newsprint consumption was 3 pounds per capita in 1880, 9 pounds in 1894, and 40 pounds in 1920. Last year was abnormal in many respects, yet there is no reason to think that the newsprint consumption in 1921 will be less than 35 pounds per capita.

It will be 217 years on the 24th of next month since the first newspaper was printed in America, and now our daily newspapers have a circulation in excess of 28,000,000 copies and there are more than 60 dailies between the Atlantic and Pacific whose circulation exceeds 100,000 copies, while some of them have several times this amount and one Sunday paper claims more than 1,000,000 circulation.

To most readers the daily newspaper is a transitory thing, hastily scanned and thrown aside, and the man who runs while he reads never stops to think what a wonderful co-ordination of service from lumberjack to newsboy is required to produce and give to him for two or three cents an up-to-the-minute resumé of world happenings in politics, industry, science, and education. Still less does the hasty reader realize that the newspaper which he holds in his hand is 100 per cent product of the forests of North America, for unlike some kinds of paper, wood fiber is the only constituent of newsprint paper. This is why the forestry problem touches so intimately every man, woman and child in the country, whether it be realized or not.

The average yearly pulpwood consumption in the United States is 5½ million cords, of which an average of 1,160,000 cords, or 21 per cent, is imported from Canada.

Our States of greatest pulpwood consumption are Maine, with an average of 1¼ million cords, of which 10 per cent is imported; New York, one million cords, of which one-third is imported; and Wisconsin, 800,000 cords, of which 30 per cent comes from outside the borders of the State.

The total amount of wood used for the manufacture of paper is not large compared with our consumption of forest products for other purposes, but because of the concentration of the industry in the Northeastern and Lake States and the large use of the three or four chief species of timber in these regions the problem of a future supply is particularly pressing.

The information at hand indicates that these may be in the Adirondack region of New York a total of 6,000,000 cords of privately owned stumpage of spruce, balsam, and hemlock, and there is in the same region about 9,000,000 cords of spruce, balsam, and hemlock stumpage on the State preserve, which at present is securely locked up against any use whatever.

If these estimates are correct, the total stand of pulpwood timber in the Adirondack region is equivalent to the rate of consumption of domestic pulpwood in the State for 25 years. However, the larger proportion of this total is on the State preserve, where all use is prohibited. Still further, these estimates make no allow-

*Resumé of an address delivered before the Washington Section of the Society of American Foresters, March 24, 1921.

This concludes our series on Forestry in foreign lands.

ance for the large amount of timber of these species annually cut for lumber.

The latest data compiled in Maine indicate that the total stand of spruce and balsam pulpwood is about 28,000,000 cords against which there is to be set an annual consumption of at least 1,000,000 cords of domestic pulpwood by the mills of that State.

The paper mills of the Lake States are using half a million cords of hemlock yearly, which will probably never be replaced.

It would seem that there will be comparatively little pulpwood of the present species left in the Northeastern States and Lake States 25 years hence, even if throughout that period the supply of Canadian wood continues in volume equal to the present, which is very doubtful.

But the Canadian supply is by no means inexhaustible. While no complete forest inventory has been taken, fairly good general data have been compiled with the following result:

Estimated Spruce and Balsam in Eastern Canada.

Province	Estimated Stand	Available Stand	Annual cut for pulp and lumber	Years Supply Available Stand
Nova Scotia ..	25,000,000	25,000,000	300,000	80
New Brunswick	36,000,000	26,000,000	1,000,000	26
Quebec	360,000,000	155,000,000	3,000,000	52
Ontario	250,000,000	100,000,000	1,200,000	83
	671,000,000	306,000,000	5,500,000	56

It is a matter of common knowledge that the pulp and paper industry will increase in Eastern Canada for some time to come, which means that there will be a corresponding decrease in the length of the timber supply above calculated. On the other hand, increasing prices and demand will eventually bring into use much of the stand that is now classified as unavailable. On the whole, it may be conservatively said that even if the Eastern Canadian Provinces began now upon an adequate scale to put all their forest land upon a permanent producing basis they will not get forest crops any sooner than they will be required for the basic industries of pulp making and lumber.

The paper industry in the East is facing two alternatives if it is to be permanent: First, the utilization of other species, and second, the growing of pulpwood—and it will have to accept both.

Notwithstanding the fact that 60 per cent of the area of the Northeastern States is better adapted to timber growth than any other purpose, the best we can hope for is a pretty severe stringency during the period between the comparative exhaustion of the present supply of pulpwood and the coming on of the new supply brought about by general forest protection and reforestation through the co-operation of National, State and private agencies.

The tremendous investments required in the development of great water powers, the construction of large mills, and the installation of exceedingly heavy and expensive machinery necessitate an operation of 40 years or more, in order to bring plant overhead down to a reasonable factor in production costs. This is the reason why the pulp and paper manufacturer must take a long look ahead in providing for his raw material.

It is particularly encouraging to note, according to the Forest Service report in response to Senate Resolution 311, that fifteen forest owners hold some 5½ million acres, or nearly one-quarter of the forest area of Maine, New Hampshire, and Vermont, and that in addition to this the National Forests in the White Mountains exceeds 400,000 acres. This is an excellent basis for forestry operations.

The present consumption of pulpwood in these three States averages about 1,700,000 cords yearly. An annual growth of one-third of a cord of pulpwood on the acreage held by these fifteen owners would equal the present consumption. It is not unduly optimistic to expect an ultimate annual growth of pulpwood at this rate if conditions of forest protection and taxation become such as to make it a safe and profitable undertaking for corporations to carry on long-time operations of this sort in order to provide raw material for their mills.

In fact, it appears that pulpwood costs and values have now reached a point where the professional forester with practical experience can prove to the paper manufacturer that he can seriously think and plan for the growing of his future supply of timber.

We can, with some degree of confidence, make the following general assumptions for pulpwood forest growing over large areas:

1. A cost of $15 per acre for land and the stocking of it with young trees, either through planting or natural reproduction.
2. An annual protection charge of 5 cents per acre.
3. Six per cent. compound interest on the investment.
4. We are justified in assuming that in the near future we are likely to have a cutting tax instead of an annual tax upon private land devoted permanently to forest growing, and we are setting a tax of this kind high enough when we make it 16 2/3 per cent. upon the final yield, which is equivalent to an annual tax of 1 per cent. upon an actual value with a 6 per cent. interest rate.
5. We are also justified in assuming, under good conditions, a yield of 20 cords per acre at the end of 40 years.

Applying the usual formulas of forest finance, we get $10 per cord as the cost of growing this pulpwood stumpage.

Anyone who is at all familiar with timber matters in the North-eastern States will have no hesitancy in saying that pulpwood stumpage will be worth more than $10 a cord long before it can be grown.

This is the real basis for belief on the part of foresters that the time has now arrived when they can demonstrate to hard-headed business men that in forestry and not destructive logging lies the future of the great industry of paper making.

A NEW JOURNAL FOR PULP AND PAPER MAKERS.

The Society of Pulp and Paper Chemists and Engineers in Germany is now represented in the literature by its own organ, called Zellstoff und Papier, which is a monthly publication of approximately 32 pages. From an examination of the contents of several copies, it is evident that this will prove a valuable source of information especially for those engaged in research work in the pulp and paper industry. The contributors are men of wide reputation who have distinguished themselves in this line of work. The journal is divided into a chemical section and a mechanical section. The editor of the chemical part is Dr. Karl G. Schwalbe and of the mechanical part Dr. Siegmund Ferenczi. The subscription price for foreign countries is 18 marks. Remittances should be sent to the Karl Hoffman Press, Papierhaus, Berlin, S.W.11.

RIORDON BALANCE SHEET.

A balance sheet of the Riordon Company, Limited, has been sent out by the company. This statement, which stands as of July 31, shows the large balance of assets over liabilities. The statement shows current liabilities as of that date standing at $13,317,817, and current assets amounting to $9,371,184, or an excess of current liabilities of $3,946,633. Total assets amount to $80,070,020.

The most interesting portion of the statement, is, of course, the current liabilities section. This shows that the company has bank and other loans secured amounting to $5,754,522, made up as follows:—Bank of Montreal, $1,990,419; Imperial Bank, $3,246,235; Royal Securities Corporation, $104,036; and 1st National Bank, U. S. A., $413,831. There is also an unsecured loan of $150,000. International Trust Company. A bank overdraft of $3,659 is also shown. Accounts and and bills payable stand at $5,524,023; jobbers open accounts and notes, $260,972; bond and mortgage interest accrued, $140,113; Dominion Government business profits tax, income tax, and interest, $838,419; Provincial Government stumpage, 1910-20 cut and interest, $127,953; a reserve for the 1920-21 cut of $299,326; capital tax and interest accrued, $96,941; ground rent, 1921-22, $24,375; and accrued liabilities, $95,697. Deferred liabilities include dividend due April 1, last, $157,500. Reserves include: depreciation, $1,581,702; insurance, $255,327; exchange, $214,314; and bad and doubtful accounts, $47,902; special reserve for contingencies and depreciation of properties at date of organization, $2,902,617.

The current assets include: investments in logs, manufactured products, etc., $8,680,040; accounts, receivable: trade, $100,860; Riordon Sales Company, $516,787; Ticonderoga P. & P. Co., $7,080; sundries, $43,293. Deferred assets include: due from directors $157,273; Victory bonds deposited with Quebec Government, $9,394; coal, 17,943; pulpwood, $14,812; freight suspense, $19,389; and sundry advances on logging operations, $45,749; insurance paid in advance, $122,477; taxes, $46,738; miscellaneous suspense debts, $918,765. Contingent liabilities include: customers notes under discount, $116,754; W. C. Edwards & Co. guarantee Gatineau Co., $478,554; and Ontario Government re Riordon Annex Housing Co., $125,000.

The rest of the statement speaks for itself. The condensed figures are presented herewith:

Assets.

Properties	$57,337,694
Gatineau invest	9,746,799
Inv. in other cos.	1,372,576
Sub. Co. advances	119,596
Invest. in trust	869,632
Total	$69,346,297

Current Assets.

Invest. of logs	$ 8,860,040
Accts. rec.	668,830
Working funds	15,019
Cash	7,294
Total	$ 9,371,184
Deferred Assets	$ 264,560
Def. to operations	169,215
Suspense	918,765
Contingent	720,308
Total assets	$80,070,020

Liabilities.

8 p. c. 1st pref. stk.	$10,000,000
7 p. c. convt. pref	10,000,000
Common stock	27,000,000
Funded debt	5,930,000
Riordon P. & P. Bds.	1,828,800
6 p. c. gold bonds	3,987,500
Mortgages	2,739,700
Total	$61,486,000

Current Liabilities.

Secured loans	$ 5,754,522
Unsecured loan	150,000
Bk. overdraft	3,659
Payables	5,524,023
Open acts., etc	260,972
Int. accrued	140.113
Taxes, etc. due	838,419
Stumpage dues	127,953
do. reserve	299,326
Capital tax	96,941
Ground rent	24,375
Accruals	95,697
Divid. due	1,818
Total current	$13,317,817
Deferments	$ 157,500
Reserves	2,099,245
Spl. reserves	2,902.617
Surplus	106,840
Total	$80,070,020

MRS. EDDY LEFT $3,500,000.

Ottawa — The Presbyterian Church of Canada, McGill University and Dalhousie University are among the chief beneficiaries of the estate of the late Mrs. E B. Eddy, of Hull.

The will shows that the deceased lady left an estate of three and one-half million dollars. The majority of the estate consists of personal property. bank and other stocks, bonds and real estate.

To the Presbyterian Church of Canada the sum of $200,000 is bequeathed, while McGill University receives the same amount for establishment of a chair or chairs to be known as the E. B. Eddy chair. The grant of half a million dollars to Dalhousie University is to be continued and the remaining unpaid instalments, which amount to around $185,000, are to be continued and paid off out of the estate.

Other beneficiaries of the will are: Robert T. Sheriff, a brother, 1,007 shares of stock in the E. B. Eddy Co., and the Eddy house and contents; a hospital in Newcastle, N.B., $25,000, with provision that if $25,000 or more is left out of the residue of the estate, the hospital receive half of the surplus, while the widow's and orphans' fund receives the other half.

Five thousand dollars is left to the schools of Chatham, N.B.

Mrs. E. J. Richardson, of San Diego, California, a sister, is given a life estate and the interest of $350,000 worth of war bonds.

Mr. William Whyte has returned to Montreal from a successful trip to the Orient. He reports a very enjoyable experience and will very soon be calling on the trade in the interests of Ayer's Felts and Niagara Wires.

Technical Section

REVIEW OF RECENT LITERATURE

A-3. Bleached Esparto Pulp. E. ARNOLUD, Rev. **Univ. Papeterie,** iv (April, 1921). Notes on the nature, qualities, and use of bleached esparto pulp.—A. P.-C.

A-3. Uses of Papyrus. Paper, xxviii, 6 (April 13, 1921). Brief historical sketch.—A.P.-C.

A-7. Evaluation of Lime by Causticizing Test. CARL MOE, **Paper Trade Journal,** lxxii, 16; **Paper,** xxviii, 7 (April 20, 1921). Report of the sulphate pulp committee of T.A.P.P.I. Brief study of the miniature causticizing test for evaluation of lime proposed by Martin L. Griffin and consisting in boiling a weighed quantity of the lime to be tested for one hour with a slight excess of soda ash (See **Paper,** xix, 4). Comparative results may be obtained within a wide variation of concentrations. By continuous boiling 63.2 per cent of the total amount of lime was converted into carbonate after thirty minutes, and 65.0 per cent after forty-five minutes. One hour's boiling apparently brings equilibrium between the reacting bodies under the conditions of the experiments. When the solution was brought to a boil and then agitated without further heating, the rate of cooling had a very marked influence on the causticity. In this special case the lime was rather hard burnt; and it is very likely that a softer burnt lime would have entered into a more complete reaction below the boiling point, if thoroughly agitated. The test might therefore perhaps give an indication as to whether the burning has been carried to a point to make a desirable product for causticizing purposes by noting the equilibrium at and below the boiling point.—A. P.-C.

A-12. Casein Used in Coating Paper. CLARKE MARION, **Paper,** xxviii, 7; **Paper Trade Journal,** lxxii, 16; **Paper Mill,** xliv, 16. Outline of the methods of manufacture of casein, and of the methods of determining solubility, strength, moisture, color and odor, acidity, insoluble matter, ash, alkali, starch, viscosity and grease.—A. P.-C.

B-3. Forest Conservation and Perpetuation. Pulp and Paper, xix (May 12, 1921). A plea for scientific forestry in Canada, and especially for proper fire protection and for the putting of the Canadian government railways under the forest protective rules of the railway commission.—A. P.-C.

B-9. National Control of Forest Devastation. F. E OLMSTED, **J. For.,** May, 1921, p. 468. An analysis of the new Capper bill, now under consideration in the United States Senate. This bill provides for national control of the prevention of forest devastation, as contrasted with the Snell bill, under which the principal elements of control would be furnished by the respective States. See comments on the Snell bill, by H. A. REYNOLDS and E. A. SHERMAN at pages 479 and 494 of the same issue.—C.L.

B-9. Ontario's Self-Renewing Gold Mine. ROBSON BLACK. **Can. For. Mag., April, 1921, p. 223.** A discussion of the economic importance of its forests to Ontario—C.L.

B-9. Forestry in Relation to Land Economics. W. D. STERRETT, **J. For.,** March, 1921, p. 224.—C.L.

B-9. National Needs and Sustained Annual Yield of the Forest. RUSSELL WATSON, **J. For.,** April, 1921, p. 390. Predicts that the present virgin stands of timber in the United States will be practically gone in 1980 and states that the outlook for adequate timber supplies for the near future is not very encouraging. —C.L.

B-10.. Decay of Wood as Influenced by Moisture. WALTER H. SNELL, **Pulp and Paper,** xix, (May 19, 1921). Outline of what is known regarding the air and moisture relations of fungi which cause decay of wood. Results obtained by Muench in the course of a long series of experiments upon the fungi which cause sapstaining or bluestaining of sap lumber and also upon several fungi which cause decay, showed that none of the fungi of either group could invade fresh (i.e., green) sapwood, which contained 50 per cent of water (equivalent to 143 percent of water calculated on the oven-dry weight of the wood). As the wood was dried, it was found that the fungi invaded the wood more deeply and did more damage the drier the wood, up to a certain limit. He failed to point out that the actual percentages which he reported hold only for woods of about the same density as those he used and do not apply to lighter or heavier woods. Results obtained by Snell on loblolly pine sapwood are very closely in line with those of Muench on Scotch pine. The greatest amount of decay occurred between 33 percent and 42 percent. From 42 percent on, the amount decreased. At 50 per cent there was little decay, and none at 60 per cent. The values representing the upper moisture limits for decay will vary inversely with the density of the wood. Snell's experiments with five different fungi, four of which occur on pulpwood, show that 60 per cent of water in the logs will eliminate all danger of serious loss from decay. A constant spray or "artificial fog" will keep the logs sufficiently wet to protect them from both fire and decay. Logs so wet will mould on the outside, but moulds do no damage to wood beyond discoloring it superficially.—A. P.-C.

B-0. Forestry in British India. T. S. WOOLSEY, jr., **J. For.,** May, 1921, p. 550.—C.L.

B-0. Present Day Forestry in Austria. F. S. BAKER. **J. For.,** May, 1921, p. 558.—C.L.

B-0. Forest Research in Canada. CLYDE LEAVITT. **Can. For. Mag.,** Nov. 1920, p. 519. Discusses forest research with special reference to the projects inaugurated by the Commission of Conservation.—C.L.

B-0. Rewards for Trained Foresters in Canada. C. D. HOWE, **Can. For. Mag.,** Nov., 1920, p. 526.—C.L.

B-0. Forest Experiments in New Brunswick. W. M. ROBERTSON, **Can. For. Mag.,** Feb., 1921, p. 81. Describes forest research work on the limits of the Bathurst Lumber Company through a cooperative arrangement between the New Brunswick Forest Service, the Bathurst Lumber Company and the Commission of Conservation.—C.L.

B-0. Effect of Forests on Flow of Streams. Can. For. Mag., April, 1921, p. 218. Discusses the results of experiments conducted at the Swiss engineering station at Zurich.—C.L.

B-0; R-11. Second National Conference on Education in Forestry. J. W. TOUMEY, **J. For.**, Feb., 1921, p. 167.—C.L.

C-6. Saw Fitting Tool. Can. patent No. 210,037, GUSTAF ANDERSON, Atlin, B.C., April 5, 1921. Claims allowed 19.—A. P.-C.

C-6. Saw Straightening Anvil. Can. patent No. 210,-169, THOMAS WEBB, Vancouver, B.C., April 5, 1921. Claims allowed 7.—A. P.-C.

D-4. Hall Process for Groundwood. Report of groundwood committee, T.A.P.P.I. W. A. MUNROE, chairman, **Pulp and Paper**, xix (April 28, 1921); **Paper Trade Journal**, lxxii, 16; Paper Mill, xliv, 16. In this process the surface of the stone is burred giving grooves through which the fibers ground in one pocket can escape regrinding under the other succeeding pockets, thus preserving intact the particles of fibers necessary to the formation of a perfect sheet of paper. It results in an increased yield of about 250lb of pulp per cord of wood, and is a considerable curtailing of the amount of sulphite required (up to 100 per cent in certain cases) owing to the better quality of the fibers. The paper gives entire satisfaction in the printing press and is generally preferred to paper made in the usual manner with a much greater proportion of sulphite. Steam cooking before grinding gave a good grade of pulp; but the additional labor involved, the expense of live steam, etc., rendered this too expensive.—A. P.-C.

F-5. Rinman's Modified Sulphate Process. BROR N. SEGERFELT, **Paper**, xxviii, 7; **Pulp and Paper**, xix, 452-3 (April 28, 1921); **Paper Trade Journal**, lxxii, 16. In the Rinman process the wood is cooked with weak caustic soda solution in the presence of a weak reducing material, preferably mercury, the temperature not exceeding 170° Cent. After cooking, the pulp is washed in ordinary diffusers, and the black liquor evaporated to about 35° Bé and at 60° Cent. Sufficient fresh caustic is added to compensate for losses, and also lime is added, and the mixture distilled at not over 500° Cent., in the presence of a small amount of steam. (See Br. patent No. 116,288, **Pulp and Paper**, xvii, 1072, Dec. 11, 1919). The advantages are: entire elimination of bad odors; the yield of pulp is as high or higher and the quality better than with the ordinary sulphate process; no hard scales on the heating surfaces of the evaporators or concentrators; loss of alkali of only 2 to 3.5 per cent of the pulp produced; lower lime consumption. Any quality of pulp desired may be obtained by suitably varying the conditions of cooking.—A. P.-.

G-4; M-0. Weightometer for Pulp. E. J. TRIMBEY, **Paper**, xxviii, 7; **Paper Trade Journal**, lxxii, 16; **Paper Mill**, xliv, 16. Description of the new Allen weightometer, which is designed specially for measuring slush pulp, and which may also be used (with appropriate changes in design) for weighing chips, acid, grain, coal, etc. It consists essentially of a hexagonal rotor, the shaft of which is carried in ball bearings which are attached to two scale beams, one on each side of the vat containing the rotor. The beams are supported on knife-edge bearings, and the weight of the rotor and the stock it contains is counterbalanced by weights at the other ends of the beam. When sufficient stock has been delivered into the top compartment (of the six) of the rotor to just overbalance the weights at the ends of the beams, the latter pivots on the knife-edge bearings and the rotor is slightly depressed, thereby releasing a finger on the compartment from a stop in the end of the vat. The rotor turns forward, delivering the stock from the filled compartment and bringing the next compartment in position to be filled. Suitable dashpots and trigger absorb the momentum and cause the rotor to come to rest without too much shock, and prevent the rotor from rotating backwards. The weightometer is used in conjunction with a Trimbey stock consistence regulator, so that the stock delivered to the apparatus is always of the same consistence, within very narrow limits.—A.P.-C.

H-5. Effects of Variables on Bleaching Efficiency. GEORGE K. SPENCE, **Paper**, xxviii, 7; **Paper Trade Journal**, lxxii, 16. Report of the soda pulp committee of T.A.P.P.I. Bleaching tests carried out have shown that increasing the consistence improves the color and shortens the bleaching time, increasing the bleaching temperature up to 120° Fahr., improves the color and shortens the bleaching time, while increase in temperature much beyond this point will shorten the bleaching time but lower the color.—A.P.-C.

K-7. Two-roll Beater. Fr. patent No. 514,865, JULES EUGENE BROTEL, (Isère), France. **Papeterie**, xliii (April 25, 1921). The rolls are placed in the two ends of the beater and the driving pulleys of the rolls are placed in a space between the rolls, which replaces the midfeather.—A. P.-C.

K-8. Coloring Paper. Patent applied for by JOSEPH TAVERDET, (Seine) France. **Papeterie**, xliii (April 25, 1921). The colored solution is sprayed on to the paper web at a point situated preferably between two sections of the driers.—A. P.-C.

K-10. Control of Alum Content of the Tub Sizing Bath. P. W. CODWISE, **Pulp and Paper**, (May 12, 1921). The method consists essentially in titrating the size bath with decinormal caustic soda using thymol blue (dibromothymolsulphothalein) paper as outside indicator. A correction factor must be applied, which is determined by titrating a sample of the alum used in preparing the size bath by the volumetric method previously published by the author (see **Pulp and Paper**, xviii, July 8, 1920) and also under the conditions of this test with brom thymol blue. A correction must be applied for the original alkalinity or acidity of the gelatin that is employed. Blue litmus paper may be used for this work, but the errors involved are much greater than with brom thymol blue. The bearing of this test on the physico-chemical properties of the tub sizing solution and of the test paper are noted. A graphical chart which eliminates the larger part of the calculations is included.—A.P.-C.

K-12. Couch Roll. Fr. patent No. 512,106, CHRISTIAN SEYBOLD, Germany, Oct. 6, 1920. Papier, xxiv (March, 1921); **Papeterie**, xliii (March 25, 1921). The water is removed from the inside of the roll by means of curved rotating blades, with or without the aid of suction.—A.P.-C.

K-12. Dandy Roll. Fr. patent No. 513,345, HUGO SCHMEIL, **Papeterie**, xliii (March 25, 1921). The roll is mounted in ball bearings which are pivoted in open forks. The stems of the latter rest each on a plate supported by a series of relatively heavy springs which in turn rest on another plate, the two plates being placed in a suitable housing. To obtain a more silent operation, springs may also be made to act on top of the ball bearings.—A. P.-C.

(continued on p. 888)

PULP AND PAPER NEWS

Every week evidence is being brought to the notice of the Ottawa authorities and the Air Board officials of the invaluable work, in the direction of fire patrol and fire-fighting that is done by sea-planes. A recent report from the Manitoba Fire Inspector, regarding the work being done in the Lake Winnipeg section, includes a statement by the District Fire Ranger, operating from Victoria Beach with Major Basil Hobbs, in charge of the Air Board station there, to the effect that he was "satisfied that the Lake Winnipeg section would now get the protection its timber supply warranted," as a result of the aerial patrols carried out by Major Hobbs. An instance was given of the value of this work is that of a fire, spotted 40 miles inland at four o'clock one afternoon, which was being successfully fought by fire-fighters, transported by sea-plane, at six o'clock the next morning.

A new lumber concern is with headquarters in Port Arthur, Ont., is starting up. Lumber, timber and pulpwood will be dealt in by this concern, which is taking the name of the Thunder Bay Lumber Company, Ltd., and which will acquire the assets and properties of the Thunder Bay Lumber and Fuel Company.

President Harding attached his signature on Tuesday in last week to the Underwood resolution authorizing commission negotiations with Canada over the importation of wood pulp for printing paper. Pulp and paper men here, with whom the writer has spoken with reference to this matter, fail to see what negotiations with the Dominion Government can effect, if the American object in view is to abrogate the regulations stipulating that wood cut on Crown lands in Ontario and Quebec shall be manufactured in this country. For such regulations and matters of purely Provincial concern—indeed, there are no Dominion regulations of any kind to that effect—and therefore any negotiations with regard to them must be with the Provincial Governments. Moreover, as these, Provincial rights are very properly regarded as invaluable, in the present condition of our forests, it is difficult to conceive what inducement for their surrender can be offered to the Provincial Governments.

This week the writer had a talk with some parties who have lately been at Dixon Creek near Haileybury, Ont., where the new fifty ton groundwood mill of the Temiskaming Pulp and Paper Company is going up. They say that this will be a first-rate structure, which will have the roof on it this fall, ready for the installation of the equipment. The work has proceeded very rapidly and satisfactorily. The Temiskaming Pulp and Paper Company has for its President, Mr. Alexander Fasken, a Toronto Lawyer, of the firm of Fasken, Robertson, Chadwick and Sedgewick, who, by the way, has recently been made a K.C.

A Michigan concern, by the name of the Detriot Sulphite Pulp and Paper Company, has recently secured an extra Provincial license for the carrying on of business in the Province of Ontario.

Great interest was taken in Toronto in pulp and paper circles in general, in the meeting of the Riordon Company's creditors which took place last Friday. There was some surprise expressed that no official statement was available at the close of the meeting, which was confined to actual creditors of the Company. It is understood, however, that the new financing plans which were submitted will, when officially formulated, provide for a sum of between $8,000,000 and $10,000,000 for the purpose of carrying the Company's indebtedness, and placing it in a position to carry on, and that, as part and parcel of such an arrangement, the present shareholders of the Company will lose all their holdings, but will retain the right to subscribe ahead of other investors to the new issue of bonds, such bonds to carry with them a bonus issue of new stock. As to the prospect of these plans successfully maturing, opinions which one hears expressed are of widely differing tenor. In part, their ultimate success is held to hinge upon the question of whether or not a large payment, due from the Company to the Edwards interests this month,—the amount in question is no less than one $1,500,000 can be met. This payment, it appears, is due on the Company's purchase of the Edwards timber limits. In those limits, the Company already has a large equity, it seems, as a consequence of previous payments amounting, it is said, in the aggregate, to over $5,000,000, but the title does not pass to it until the payment of the $1,500,000 due this month has been made. It will thus be seen that, if this sum is not forthcoming this month, the Company stands liable to a very grave loss. There is no reason to believe that the interests concerned will not in all likelihood, agree to a further extension of time on this payment—one such extension, it is stated, has already been granted.

The Canadian Barking Drum Company, of Toronto, reports the sales through its Toronto office of another drum to the Spanish River Pulp and Paper Mills, Ltd., which has previously purchased from it a very large number of drums, and also of a drum to the Dryden Pulp and Paper Company. The Chicago office also reports contracts for drums awarded by the Racquette River Pulp and Paper Company and the Consolidated Water Power and Paper Company.

Mr. James Simpson, the well-known Socialist, addressed a large meeting of striking printers and their wives, held in the Labor Temple, Toronto, the other day, gave a review of the strike situation in Toronto from its start down to the present. He stated that, at present, there are some 875 employees of local printing establishments out on strike, and that more than $16,000 a month—which is supplemented by a few dollars a week per man from the local Union's funds—is being paid out by the international fund in the form of strike pay.

Very satisfactory reports are received of the operations at the groundwood plant of the Fort William Paper Company. It is stated that the plant is working to capacity with plenty of orders booked and business in sight. Colonel Thomas Gibson, of Toronto, is the President of this company.

Last week, the striking printers at Ottawa, belonging to the Typographical and Printing Pressmen's Unions, which have been on strike since the 1st of June for the forty-four hour week, published, for the first time, an official two-sheet organ entitled "The Printers'

Inkling." It contained the announcement that it is endorsed by the Trades and Labor Council, and is supported by 9,000 working men with a purchasing power of more than $200,000 a week. It is issued from the Printers' and Pressmen's Clearing House, and is bilingual in character. It carries a quantity of advertising and solicits public and private printing.

In Saint Luke's Presbyterian Church, Bathurst, N.B., at 9.30 on the evening of August 3rd., Miss Mary MacLean, daughter of Mr. Angus MacLean, became the bride of Mr. Robert Edwin Sproule, of Ottawa. The ceremony was performed by the Rev. A. D. Archibald.

The capital stock of The Nashwaak Pulp & Paper Company, Limited, has been increased from seventy-five thousand dollars to eight hundred and twenty-five thousand dollars by supplementary letters patent. The increase is made by the addition of one hundred and fifty thousand shares to be sold at five dollars a share and to be classed as preference shares.

Large shipments of groundwood pulp are being sent by the Fort William Pulp and Paper Co. to the Laurentide Co. The new mill at Fort William is reported operating continuously and successfully.

A despatch from Port Arthur reports that plans are under way for refinancing the Kaministiquia Pulp Co. in order to put it again in commission by the bondholders.

A Forestry Convention will be held at Vancouver and Victoria next September.

An extensive tour of Ontario by the Forest Exhibit Car commenced July 21st and will cover practically the whole of the forested areas along railway lines. A unique method of advertising the coming of the Exhibit Car was employed in the Lake St. John region where aeroplanes acted as advance agents and by flying low over many villages dropped hand bills by thousands.

Ten thousand copies of a new Forest-Book in English and 10,000 copies in French are being prepared by the Canadian Forestry Association for presentation to senior Boy Scouts and to senior boys in the French-speaking communities of Quebec.

The Forest Exhibit Car, with French and English-speaking officer aboard has just completed a successful tour of the Quebec and Lake St. John Railway. In addition to the stream of visitors to the car through the day, evening meetings were held at which addresses on forest protection were given and motion pictures shown. Parish priests and other local leaders took a prominent part in these meetings. The evening attendance varied from 650 at such points as Metabetchouan and St. Gedeon, to over 3,000 at Chicoutimi. At the latter place the grand stand of the Fair Grounds was used by the audience and a special platform erected for the speakers.

The pulp mill of the Bear River Pulp and Paper Co. has been closed for lack of water. The rain fall this year has been only about 1/3 of normal.

At a meeting of the Advising Board of the N. B. Department of Lands and Mines, this week, the Pijipscot Pulp Co. asked permission to export timber infested with the spruce bud-worm. A recommendation will be made to the Lieut.-Governor.

RECEIVER FOR NEWSPAPER.

Announcement of the appointment of the Union Trust Company of Detroit, as receiver for The Detroit Times, an evening newspaper, has been made following a petition for involuntary bankruptcy, filed in Federal Court Saturday.

CARL GUSTAF NILS HAMSON.

On the 13th of August, K. Gustaf N. Hanson, a well known sulphite engineer, passed away in Montreal.

Born in Sweden 1880, and coming from the old sulphite maker family, of which Magnus and Nils, his uncles, and Magnus Jr., his brother, also are members, he graduated as a mechanical engineer from Chalmers Technical Institute of Gothenburg, Sweden, and thereafter worked as engineer in the construction and operation of several Swedish sulphite mills.

Mr. Hanson came to the United States in 1913 and entered the employ of the New York & Pennsylvania Paper Co., Johnsonburg, Pa., where he remained until 1915 when he was appointed general superintendent of the St. Lawrence Pulp & Lumber Corp., Chandler, Que.

In the fall of 1916 Mr. Hanson was made chief engineer of the Ha. Ha. Bay Sulphite Co., Port Alfred, Que., and supervised the construction of this mill. When the mill commenced manufacturing, early 1918, he was appointed mill manager and remained in that capacity until the fall of 1920 when he took up the position of assistant to the local manager of the Kipawa plant of the Riordon Co. Ltd. The great success of the Ha. Ha. Bay Sulphite Co., starting the mill and getting up to full production in record time, was to a large extent due to his efforts.

He was considered as one of the best sulphite engineers in Canada and as a man of sterling qualities, whose loss is deeply felt among a great number of friends. He leaves a widow and little daughter.

JAMES IMRIE WAS 67.

Death came suddenly to Mr. James Imrie, manager of the Montreal branch of W. J. Gage and Company, stationers, when he was spending a week end at Morin Heights. When he left Montreal on Friday afternoon last after attending to business as usual, he was apparently in good health, but on Saturday morning he complained to his family of a pain in his chest. Medical aid was called in, and it was thought that there was nothing beyond an attack of indigestion. After lunch, however, while resting, Mr. Imrie suddenly collapsed and died before help could be rendered.

The late Mr. James Imrie was born in Glasgow, Scotland, and was 67 years of age. Coming to this country about fifty years ago, he settled down in Toronto in the stationery business with Warwick Brothers of that city. Over twenty-five years ago he came to Montreal as representative of W. J. Gage and Company, Toronto, stationers, and has held the managership for them ever since.

Mr. Imrie is survived by his widow.

DONNACONA CO. SECURES LIMIT.

Timber limits located at the watershed of the Jacques Cartier River, in Montmorency County, have been purchased by the Donnacona Pulp and Paper Co., from the Province. The company was interested in these limits on account of the necessity of supplying their mills with timber the whole year round. The price of adjudication was set at $700 per square mile. The stumpage dues will be paid at a rate of 5 cents over the minimum fixed by Order-in-Council in 1920.

The River aux Outardes timber limits, which were also on sale, had no bidders and the same was the base in regard to the Manicouagan water power, also offered for auction.

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K-12. Improved Suction Boxes. Fr. patent No. 511,466, JACOB HEESS, Germany, and ROBERT JOSEPH MARX, England, Sept. 24, 1920. **Papier,** xxiv (March 1921); **Papeterie,** xliii, (March 25, 1921). The suction boxes are placed side by side without any space between them. It is claimed that in this manner better dehydration is obtained with less suction. The power consumpton and the wear on the wire and on the machine are less, and the quality and uniformity of the paper are improved.—A.P.-C.

K-14. Paper Winders. Fr. patent No. 479,857, LEON THIRY, Belgium. **Papeterie,** xli (May 25, 1919); **Paper,** xxvii, 25)Feb. 23, 1921). See **Pulp and Paper,** xvii (Sept. 25, 1919).—A.P.-C.

K-14. Slitting and Rewinding Problems. Pulp and Paper, xiv (May 5, 1921). Brief comments on the results achieved by the Cameron Machine Company during the last ten years, in the designing of standard and special types of slitting and rewinding machines for service in the paper trade.—A.P.-C.

K-18. Fiber Board. Can. patent No. 210,056, MANLEY CHEW, Midland, Ont., April 5, 1921. As a new article of manufacture, a fiber board composed of chip waste reduced to a cooked, shredded, pressed, dried state, permeated with a suitable chemical and physical binder and waterproofed. Claims allowed 3. —A.P.-C.

K-20. Parchment and Imitation Parchment. G. SCHUMANN, **Papier-Markt,** March 19, 1921; **Pulp and Paper,** xix, (May 5, 1921). Brief description of the processes of manufacture of so-called genuine parchment paper and of imitation parchment papers.—A.P.-C.

K-23. Mottled Paper. Fr. patent No. 506,632, CHARLES CLARK ORCUTT, U.S.A. **Papeterie,** xliii, (March 10, 1921).—A.P.-C.

K-23. Coating Paper with Metal Foil. Fr. patent No. 513,342, FRITZ TSCHEIKE, Germany. **Monit. Papeterie,** lii (March 15, 1921); **Papier,** xxiv (April, 1921). —A.P.-C.

L-4. Paper Bottle. Can. patent No. 210,195, The Empire Paper Bottle Company, assignee of WALTER E. HINDLE and JOHN DICKINSON, all of New York City, N.Y., U. S. A., April 5, 1921. As a new article, a paper bottle the mouth of which is crimped, and an external band attached to the crimped material, said band being provided with a ripping member. Claims allowed 9.—A. P.-C.

L-7. Paper Textile Apparatus. A process and apparatus for making narrow slits in paper strings intended for the manufacture of sockets with collars. Fr. patent No. 512,587, EMIL JAGENBERG, Germany, Oct. 16, 1920. **Papier,** xxiv (April, 1921).—A. P.-C.

L-7. Moistener for Paper Strips Used in Textiles. Fr. patent No. 512,586, FERD. EMIL JAGENBERG, Germany, Oct. 16, 1921. **Papier,** xxiv (April 1921).—A. P.-C.

M-0. Care of Metallic Packings.. CHARLES C. HALL, **Paper,** xxviii, 6 (April 13, 1921). Comparison of Durametallic packing (made by rolling antifriction metal into thin sheets, covering with a mixture of oil and graphite. crinkling, and then rolling and compressing the sheet into a strap or bar which contains many small cells filled with lubricant) with fibrous packings, showing the advantage of the former over the latter.—A. P.-C.

N-4. Safety Features of Steam Boiler Accessories. WARREN HILLEARY, **Paper,** xxviii, 6 (April 13, 1921). A brief discussion of safety valves, water gauge glasses, gauge cocks, high and low water alarms, pressure gauges, and blow-offs.—A.P.-C.

O-2. Residual Aluminum Compounds in Water Filter Effluents. ABEL WOLMAN and FRANK HANNAN, **Chem. Met. Eng.,** xxiv (April 27, 1921). The reaction of aluminum sulphate with alkaline waters is a complex mobile transformation. The reaction seems to be delicately dependent upon the actual alkalinity of a water, its hydrogen ion concentration, rather than upon its potential alkalinity. The hydrogen ion concentration in its turn is regulated to a large extent by carbon dioxide equilibria. Evidence so far accumulated seems to indicate that complete precipitation of Al $(OH)_3$ takes place at a hydrogen ion concentration somewhere near the neutral point, PH 7.0, unless disturbing or buffer influences are operative. Outside of this zone of favorable alkalinity resolution of insoluble flock occurs to a greater or less degree. The appearance of aluminum compounds in filter effluent, should not be accepted as due to faulty operation, according to orthodox interpretations, but to failures due to misunderstanding of the reactions involved. This statement is given in the nature of a hypothesis, to be substantiated by further experimental evidence. If the hypothesis is found to be true, the problem of residual alumina, not only in filter effluents, but in all coagulated waters, may be attacked from a new angle.—A. P.-C.

O-3. Permutit Water Purifier. Can. patent No. 210,230, The Permutit Company, New York, N.Y., U. S. A., assignee of J. D. DIEDEL AKTIENGESELLSCHAFT, Berlin, Germany, assignee of ROBERT GANS, Penkow, Germany, April 5, 1921. A process for the softening of hard water consisting in merely passing the hard water downwardly through zeolites, then cutting off the supply of water and regenerating the zeolites by merely passing through them a solution of common salt, and washing out the salt solution, the washing being so accomplished that no pocketing of the salt solution occurs, and then passing hard water downwardly through the zeolites, and so on. Claims allowed 5.—A. P.-C.

P-4. Treatment of Acid and Alkali Burns. A. K. SMITH, M.D., manager, medical section, E. I. du Pont de Nemours & Company, Wilmington, Del., **Chem. Met. Eng.,** xxiv (April 27, 1921. Outline of the treatment used by the du Pont Company for caustic burns.—A. P.-C.

P-0. Ontario Pulp and Paper Makers' Safety Meeting. Pulp and Paper, xix (May 5, 1921). Brief account of the meeting held in Toronto, April 20, 1921, with texts of President Carruthers' and Secretary Costigane's address.—A. P.-C.

R-2. Employees' Magazines as Viewed by their Editors. ALBERT HIGHTON, editor of "Eagle A" Unity. **Paper,** xxvii, 25 (Feb. 23, 1921.) — Results of an investigation into the purpose and usefulness of company magazines for employees, in the form of replies to a questionnaire sent out to the editors of forty company publications representing various industries. —A. P.-C.

R-5. Pulp & Paper Trade of Belgium. Papier, xxiv, (April, 1921. Statistics of the importations and exportations of pulp and paper during 1919 and 1920, and also of the market values of stocks of various pulp and paper companies during the last year and of the last dividends paid by them.—A. P.-C.

INCREASED YIELDS AND DECREASED COOKING TIME BY IMPREGNATION IN THE SULPHITE PROCESS.

Experiments made on impregnation of wood chips in the Sulphite Process by the Forest Products Laboratory, Madison, Wis., and described and explained in a recent paper by Vance P. Edwardes, are well worthy of extended study and consideration by mills which make a news grade of sulphite pulp. Very excellent results were obtained in shortening the cooking time while the yield of pulp was increased to a marked degree.

Chemical examination and analysis of wood shows that the actual cellulose content, in such woods as spruce, fir and hemlock, is approximately 62 per cent., the remainder being lignin, with a very small percentage of volatile oils, etc., and not available for chemical pulp.

The cooks at the Forest Products Laboratory were on an experimental scale and under conditions of close and accurate control in a small digester holding about 80 pounds of bone dry chips. All figures for yield, acid, and bleach consumption were worked out on the bone dry weight of the wood, which is the only sound basis known. Several regular or "normal" cooks were made in order to put all of the experiments on a comparative basis.

The underlying principle involved in impregnation is to distribute the liquor throughout the pores of the wood so that in the process of cooking, all of the lignin will be removed, but as little cellulose as possible destroyed. The first experiments to obtain impregnation were made by creating a vacuum of about 20 to 25 inches of mercury in the digester after it had been filled with chips and the cover tightly bolted on. Then the acid charge was run in through the bottom of the digester, holding the vacuum at the same time. The next step was to apply about 75 pounds pressure to force the acid into the wood chips. Later, cooks were made by the application of pressure alone, and in all of the cooks, various degrees of vacuum, pressure, etc., were tried. The indications were that best results were obtained by pressure only.

The results of these experiments seem to indicate that the pulp obtained is equal in strength to "regular" news sulphite and that the color is fully as good. However, it may be possible to effect two important savings by the use of this principle, (1) Decrease in time of cook and consequently a lower steam consumption, and (2) Increase in yield from the same amount of wood with practically the same amount of cooking liquor as in the regular process.

The saving as indicated in the experiments was made by lowering the standard experimental cooking time of 8 hours to 4 hours in one case, although best results were obtained in about 6½ hours. This is nearly a 20 per cent. decrease, and can be considered as a possible average figure.

The second important feature is that by the use of varying degrees of vacuum and pressure, the percentage of yield based on the bone dry weight of the chips was increased from 46 per cent., in the "standard" cooks, to 57 per cent. and 60 per cent. in several cases. Assuming that it is possible to increase the yield to 52 per cent., this would amount to a saving of 12 per cent. This means an actual saving in wood consumption, because more pulp is obtained from the same wood.

The paper by Edwardes also mentions experiments on a commercial scale also now being tried, and they are certainly well worth the most serious consideration of any plant which makes sulphite pulp. A 10 per cent. decrease in cooking time, and a 5 per cent. increase in yield would mean a great saving to the mills, and one that appears possible with every little added expense. It will, however, be necessary to exercise close operating control and to know the bone dry weight of the chips used in order to apply this improved method and figure the savings effected.

GUMMED PAPER PRESERVES FRUIT.

Atlantic City, Aug. 11. — That gummed paper tape can be used to preserve perishable fruits and thereby greatly add to the palatability as well as to the keeping qualities of fruit, was disclosed at a meeting of the Gummed Paper Manufacturers at Atlantic City, during the convention of the National Association of Corrugated Fibre Box Manufacturers, when J. W. Webb, inspection engineer for the Container Club of Chicago told of experiments in car lot shipments.

He said that the packing of melons, apples, peaches, citrus and other fruits in corrugated fibre boxes, with gummed tape used to hermetically seal the containers, added surprisingly to the length of time in which the fruit could be kept fresh.

He gave various instances of the experiments made, and said that the time element varied according to the species of fruit being shipped. He urged the gummed paper manufacturers to note this opening for additional business.

The Gummed Paper Manufacturers Association decided to continue its present organization, and elected W. R. Lusignan of Samuel Jones & Co., Newark, N.J., Vice-President, Phillips Kimball of the Liberty Paper Company of New York was named as a committee of one to discuss with the Container Club the standardization of gummed tape.

The association agreed on a set of trade customs and a committee was named to formulate a uniform sales contract.

A NEW PAPER MACHINE DRIVE.

Due to the fact that the plant in which our first paper machine was installed has no basement and because the trusses are 40 feet above the floor line of the mill, it was found necessary to depart from the usual practice of driving the machine with belts and pulleys. After much thought and research it was decided to use a battery of variable speed transmissions. The machine itself is driven in six separately controlled sections, which in turn, are so installed as to make a single unit drive controlled for direct speed changes through a master variable speed transmission. This controls smaller machines in machine drive line.

The use of variable speed transmissions as a paper machine drive is a big departure from ordinary custom. After putting the machine through the most severe tests of every kind in an effort to discover whether or not such a drive was practicable, it was found satisfactory and successful under all conditions.—From The Valley Iron Works "Beater."

Messrs. Tuxor and Kennely, chemical engineer and forestry manager for the Northwest Paper Co., Cloquet, Minn. were recent visitors at the Belgian Industrial Co. at Shawinigan Falls.

Some folks knock so loud they can's hear the invitation to come in.

UNITED STATES NOTES

A quick return to prosperity in the paper industry is forecast in the monthly bulletin to members issued last Thursday by the American Pulp and Paper Association. "The entire trend of reviews of business," says the bulletin, "considering the fact that the paper industry was not an extensive participant in the plant enlargements seen in other industries during and after the war, gives the paper industry every reason to feel a decidedly optimistic spirit. The paper industry, not having been inflated by war conditions to the extent notable on other industries, is not subject to the same degree of deflation evident elsewhere. The smoothing out of the labor situation. lower prices for raw materials, with constantly increasing per capita demand for the product of their mills, should encourage paper manufacturers to prepare for better and more stabilized business than ever before in history after the months of more or less slow recovery which were inevitable."

For the year ended May 28, 1921, the United Paper Board Company, Inc., reports a net profit, after taxes, charges, depreciation, etc., of $456,668, equivalent after preferred dividends, to $3.64 a share earned on the $10,105,000 common stock outstanding, this compared with a net profit of $840,010, equal to $8.11 a share earned on the $9,186,400 common stock outstanding in the previous year. Mill earnings totalled $731,041, against $561,741. Cash accounts showed $422,474, and accounts and notes receivable $567,966. Sidney Mitchell, president, in his report to stockholders said: "Under the sinking fund for purchase of preferred stock the company purchased 2,426 shares of preferred stock, and at the annual meeting of stockholders last November, the authorized preferred stock was reduced from $2,500,000 to $1,500,000. The suit against this company in the sum of $1,500,000 instituted by a committee of collateral trust bondholders of the United Boxboard and Paper Company for a deficiency under foreclosure has been dismissed."

Statistics compiled by the Bureau of the Census show that daily newspapers printed in the United States total annually 11,270,559,316 copies, an average of one copy a day for every 3 1/5 persons of the country's total population. Total circulation of the country's 20,431 newspapers and periodicals aggregated 15,475,145,102 copies for the year, an increase of 7 per cent per issue in five years. That includes daily, Sunday, tri-weekly, monthly, quarterly, and all other newspapers and periodicals. The printing and publishing industry's products were valued in 1919 at $1,528,856,503, an increase of 116 per cent. in five years.

The Underwood resolution, authorizing commission negotiations with Canada regarding importation of wood pulp for print paper, was signed last week by President Harding. Appointment of the American Commissioners will be delayed, it is reported in Washington, until Great Britain has assented to the proposal. The State Department is understood to feel that such a negotiation could not well be undertaken with a British dominion without full approval from London which is expected in the near future. It is said in Washington that Frank Lyon Polk of New York, Under Secretary of State in the Wilson Administration, will head the commission. The name of Victor F. Lawson, owner and publisher of the Chicago "Daily News," has been mentioned as one of the probable five members of the Commission. Membership on the commission is purely honorary and draws no salary. The appropriation for carrying on this investigation has been cut from $50,000 to $10,000.

The Union Bag and Paper Company has declared the regular quarterly dividend of $2 a share, payable to stockholders of record on September 3. It is estimated that the company's pay-roll will be reduced approximately $500,000 yearly by the settlement of the wage question with paper mill workers. The company's mills are running about 60 per cent. of capacity, and its newsprint subsidiary the St. Maurice Paper Co., is operating at 100 per cent. capacity.

O. M. Porter, Secretary of the New York Section of the American Society of Foresters, has been made secretary of the Glazed and Fancy Paper Manufacturers Association. The place has been held by one of the manufacturers, and as it has been found that it required more time than could be given by a man otherwise occupied, it was deemed best to have a man in the position who could give his entire time to the work.

The old Continental building in Ogdensburg, N.Y., will again be put into use in a short time when the Ogdensburg Paper Mills, Inc., opens it as part of its new plant. The grinders of this company were set in motion recently, beginning operations on the making of the first wood pulp ever manufactured in Ogdensburg. The Continental building has been lying idle for years and its utilization is due entirely to the enterprise of James A. Outterson of Carthage and F. A. Augsbury of Ogdensburg who have been the prime movers in the organization of the Ogdensburg Paper Mill corporation which promises to be one of the live wire business institutions of Ogdensburg.

PULP MILL EXPLOSION FATAL.

Mechanicsville, N.Y., August 22.—Five men were killed and a sixth injured, probably fatally, by the explosion this afternoon of a battery of three high pressure boilers in the plant of the West Virginia Pulp and Paper Company. The force of the explosion, the origin of which is not known, tore the roof from the building and hurled it into the Hudson River, 100 feet away.

TERRA NOVA MILL DELAYED.

The Twillingate, Nfld., "Sun" says: "In conversation with Mr. Baird we gather that work is somewhat delayed at the Terra Nova property owing to the exchange situation. The Norweigan Kroner worth normally about 28 cents today brings only 14 when expressed in Newfoundland currency. Last winter's cut is now all out to the last "steady," and contains besides pulp wood about a million feet of saw logs. The walls of the mill are now built and the paper storage building roofed, while a large steamer recently landed about 400 tons of machinery of various kinds including the digesters."

The Markets

CANADIAN TRADE CONDITIONS

Toronto, 20th August.—It is pleasing to be able to report that, during the last few days, business, in a good many lines of the paper industry has shown signs of picking up considerably. Of course it is just possible that this brisking up of business may turn out to be somewhat in the nature of a "flash in the pan," and in any case, it is too recent for one to build confidently on it. But, all the same, it looks, at the moment, to be too wide in the scope for it to be purely spasmodic and temporary in character. More than one man prominent in the industry has told the writer that he should not be surprised if it turns out to be the beginning of the revival of the paper trade which, all through the past months of depression, has been steadfastly looked for as being likely to take place about the beginning of the fall.

In the interests of the paper industry as a whole, it is devoutly to be hoped that the Riordon concern will shortly be placed on a basis that will afford a genuine guarantee of stability. Elsewhere in this issue something is said about the creditors' meeting at Montreal yesterday, and as to the plans which, it is believed, were submitted thereto. The proposals, on which such plans are based are understood to look to the raising of no less a sum than $10,000,000, of which—according to the strong and persistent rumor— the directors are ready to subscribe $1,000,000, while two Canadian companiesh interested are understood to have promised $1,500,000. At the meeting in question, the present creditors' committee was re-appointed to act for a further three months, and the Company was granted an extension of time for that period, such extension, however, being made subject to cancellation by the committee.

The strike of the Toronto printers still shows no signs of any likelihood of ending. Indeed there seems no prospect of either side giving way, or reaching a compromise, over the matters in dispute, the most important of which is the question of the forty-four hour week. On the other hand, the employers are going ahead with the work they have in hand and in improving their plans for the future operation of their plants under conditions more to their liking than those to which the strikers will agree. On the other hand, the strikers utterly scout the idea that they may soon be forced to give up the struggle by reason of lack of funds. New heart, if they needed it, was probably put into them by the speech made, the other day, in the Toronto Labor Temple by Mr. John McParland, the President of the International Typographical Union, who was passing through the city and stopped off to address the striking printers and their wives. Mr. McParland told them that "the International Typographical Union can carry on the fight for the forty-four hour week indefinitely." He said that of the 40,000 members of the Union, employed in the commercial printing branch, 31,000 were now enjoying a forty-four hour week, and 8,000 men in the United States and Canada were now on strike for the same principle. On the subject of the Union's financial ability to continue the payment of strike pay to this big total of men, he said that the total contributions to the defence fund amounted to $1,000,000 per month, while the disbursements to striking members totalled only $800,000 a month. Thus a large surplus, at the rate of $200,000 a month was being piled up, be added, and the Union was consequently able to carry on the struggle as long as the employers wished to hold out. So there the matter stands—a very pretty example of an irresistible force meeting and immovable body!

PULPWOOD.—The demand for pulpwood continues light, many mills having large quantities on hand. Nor is there much anxiety displayed to add to these stocks at present, as there is an expectation that a reduction in freight rates—a matter which enters largely into the question of pulpwood prices—may shortly result in price reduction.

NEWSPRINT.—The price of newsprint is a subject which continues to evoke a good deal of interest and speculation—particularly in publishing circles. That the price will be about $80 a ton for the last quarter of the current year seems to be the general idea now in such circles. But it may be that, here, the wish is father to the thought. Several mills—notably those of Laurentide and Abitibi—are reported to be very busy. Speaking of the Laurentide, by the way, there is considerable interest felt in the new world's record hung up by its No. 9 machine, built by the Dominion Engineering Works, Ltd., of Montreal, which turns out newsprint at the rate of 1,000 feet a minute regularly.

WRAPPING PAPERS. — There has lately been a notable improvement in the business in wrapping paper, particularly in kraft. The writer was told today by the representative of one of the largest mills that it was anticipated that this month's business would prove to be better than that transacted in any previous month of this year. Having regard to the fact that August is usually a dull month for the paper trade generally, such a statement as this for such a quarter must be regarded as satisfactory in the present, and distinctly encouraging for future prospects.

COATED PAPERS.—During the past days there has been a decided expansion of demand for coated papers and also for writing papers and envelopes. Orders, too, that are coming along are somewhat larger in size.

BOX BOARD.—There is an improvement in the demand for boxboard, and some mills report that quite a nice business is being done.

TOILETS AND TISSUES.—The trade in tissues has not shared largely in the prevailing depression of recent times, and the business in tissues is fairly good and improving. That in toilets is also improving.

NEW YORK MARKETS.

New York, August 20—(Special Correspondence).—One of the important developments in the paper industry this week was the announcement of the decision of the board of arbitration appointed last month to adjudicate the differences between the management and union employees of newsprint paper mills in the United States and Canada who went on strike last May. The new rates represent a 10 per cent reduction

for skilled workers and a 25 per cent reduction for unskilled men, as reported in the Pulp and Paper agazine last week.

Just what effect it is likely to have on the paper market is at the moment problematical other than it is expected to lead to a more stabilized condition, as labor costs will now be put back to a level equivalent to those prevailing in 1919. No announcement has been made by newsprint manufacturers in this country regarding the price they will charge contract customers over the final quarter of the year.

There is little of note stirring in the newsprint market. Shipments on contract continue to move along regularly, but spot demand is slow, though, when everything is said, not so light for this season of the year. Publishers are unquestionably eating into their surplus stocks of newsprint and the time is coming when they will be obliged to look around the market for increased supplies. Statistics show that consumption of print paper has fallen off but a trifle thus far this year in comparison with 1920, and the fact that production is considerably under that of last year, owing to the strike and other causes, means that in due time surplus holdings of newsprint will have disappeared. Prices are gradually getting down to levels, moreover, where consumers should not hesitate to buy for forward requirements as well as to cover immediate needs. Newsprint at 4 cents per pound, which may be the market basis for the final quarter, is not so far in excess of pre-war levels. Publishers can hardly expect to see a return of 2.25-cent newsprint, not if mills are to realize a profit. Even before the war most manufacturers were literally starving for marketing paper at such a price, and it must be remembered labor, raw materials and all other production costs are today easily a hundred per cent above pre-war, and are likely to continue to be.

Tissue papers are in very good demand. Not alone are coarse tissues moving freely, but fine tissue is steadily improving in demand, and mills producing these grades of paper are constantly increasing operations. Reports say that a single order for six carloads of No. 1 white tissue was placed with a Middle West mill a few days ago, which even in the busiest of times is a big order for tissue. Quotations are firm at around $1 per ream for No. 1 white, 20 x 30, and for No. 1 manila, 24 x 36.

Book papers remain in a generally unchanged condition. Reports have been heard of some mills making sales of machine finished book at 5.75 cents a pound f.o.b. New York, but this is declared to be under the market, around 5.25 cents being the price commonly quoted, with some mills situated a good distance away naming 6.50 cents, and even 6.75 cents, f.o.b. this city.

Fine papers are quite through no further important changes in prices are noted. There is an easy tone to quotations, and mills are granting concessions rather than let the available business escape them, but no one is slashing prices with a hope of stimulating demand. The leading writing paper manufacturing organization in New England is said to be operating its plants about 50 per cent of capacity, and other mills are probably not doing any better on an average.

Boards present a little firmer tone. Boxmakers continue to buy cautiously yet demand if anything is picking up. The season is fast approaching when the paper box business broadens, and board manufacturers and dealers are expectant for an increased demand for boards in the near future. Most of the current buying is being done at around $28 per ton f.o.b. New York for plain chip and $30 for news board.

GROUND WOOD.—Quotations on mechanical wood pulp are steady to firm and most of the reports received tell of a fairly good business passing. Consumers are purchasing in a careful manner and are mostly limiting orders to tonnage actually required, but on the whole ground wood is moving freely, and the tendency of prices is unmistakably upward. Low water has forced more grinding mills to close down, it is said, and this situation has a strengthening influence on the market, while the general willingness of producers not to market pulp unless securing full prices also is a sustaining factor. About $30 per ton f.o.b. grinding plants is an average of quoted prices on domestic spruce ground wood, freshly ground. Some sales down to $28 have been reported; on the other hand, some manufacturers are said to be firmly holding for $32. Scandinavian ground wood is offered in this market at around $28 a ton ex the dock, but most of the supply offered is for shipment from the other side and therefore not immediately available.

CHEMICAL PULP—Trade in imported chemical wood pulp appears to be on the rise, despite which prices continue on the downtrend, with sales recorded at new low levels. Domestic pulps are mostly ignored by buyers at present for the reason that foreign pulp is available at so much cheaper figures, and it is extremely difficult to get an accurate line on domestic pulp values.

According to reports, some lots of Scandinavian and German bleached sulphite of No. 1 quality have been sold to American paper mills at 3.75 cents a pound landed here, yet there have also been sales noted at 4 cents indicating that all importers have not reduced prices to the low level or else that the bleached sulphite coming in from Europe differs considerably in quality. Scandinavian kraft pulp has sold down to 2.10 cents per pound ex the dock, with offerings at between 2.15 and 2.25 cents fairly numerous. Foreign unbleached sulphite of No. 1 grade is quoted at 2.50 to 2.75 cents. Importations at New York, Baltimore and other Atlantic ports during the past several weeks have increased substantially, thus confirming reports that American paper mills are buying quite extensively abroad.

RAGS.—While most descriptions of paper making material appear to be becoming livelier, rags prove to be one of the foremost exceptions. There is very little business in rags. Roofing felt mills are absorbing a few small lots in a spasmodic way, blotting paper mills are buying naw and them, and some writing paper manufacturers are placing an occasional order, but the aggregate movement of supplies is unusually light and altogether insufficient to create any firmness in values. Such buyers as are operating in the market are invariably obtaining the rags wanted at price concessions and conditions are such that only actual buyers can determine at just how low purchases can be made.

PAPER STOCK—Insofar as regards the situation in New York, waste papers are in a distinctly firmer position and prices are perceptibly strengthening, sales having been reported this week placing values on higher levels in a number of cases. The scarcity of most grades is quite pronounced, owing to the refusal of collectors to gather paper at present market prices and also owing to the small production of printing houses, and it appears that it is this factor that is making for the firmness rather than any voluminous buying by consumers.



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OLD ROPE AND BAGGING.—Old rope is firm in price at around 4 cents per pound, and mixed strings are bringing between 60 and 70 cents a hundred pounds at shipping points in sales to consumers. Old bagging is dull and nominally priced at about 75 cents per hundred for No. 1 scrap bagging, one cent a pound for gunny bagging and 50 cents a hundred for roofing bagging.

STEAM ACCESSORIES SUCCESSFUL.

The Beveridge Supply Co., Ltd., Montreal, have advised the Pulp and Paper Magazine of the success they are having with Damper Regulators and Vulcan Soot Cleaners and have sent specimen catalogs which they will send anyone on request. An interesting letter from a Canadian mill is included, comparing favorably the efficiency of this cleaner with another prominent make. The Beveridge Supply Co. now handle a complete line of boiler room supplies.

HELPFUL CATALOGS.

The Canadian Fairbanks-Morse Co., Montreal, representing W. H. Allen, Sons & Co. Ltd., Bedford, England, are distributing a circular describing the "Allen" Engines and Pumps. Manufactured in England, and used extensively by the British Admiralty and Mercantile Marine, as well as in the industrial plants, they are well known in all parts of the world. One of the illustrations is a picture of pumps for the Dryden Pulp and Paper Co.

The following is a list of the booklets on different subjects which Canadian Fairbanks Morse will be glad to send on request:

Oil Engine Driven Pumps;
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COST OF BISHOP FALLS FIRE.

The damages aused by the fire at the Read Pulp mill. at Bishop's Falls are estimated to be about one hundred and twtnty thousand dollars. The fire is said to have been caused by a spark from the mill chimney. The cutting up room and the slasher room were totally destroyed, the wood room partially burnt out and some roof work damaged. It will take some weeks before pulp operations will be resumed.

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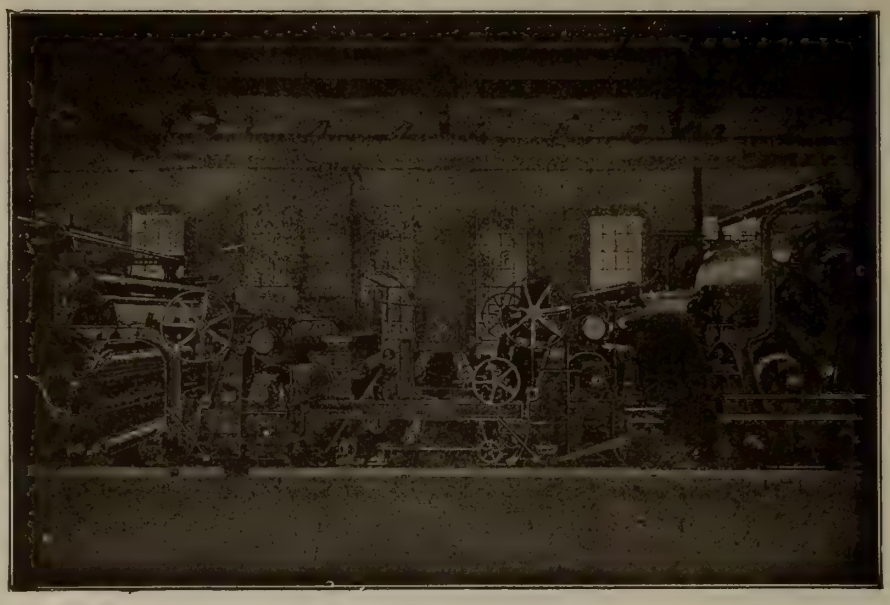
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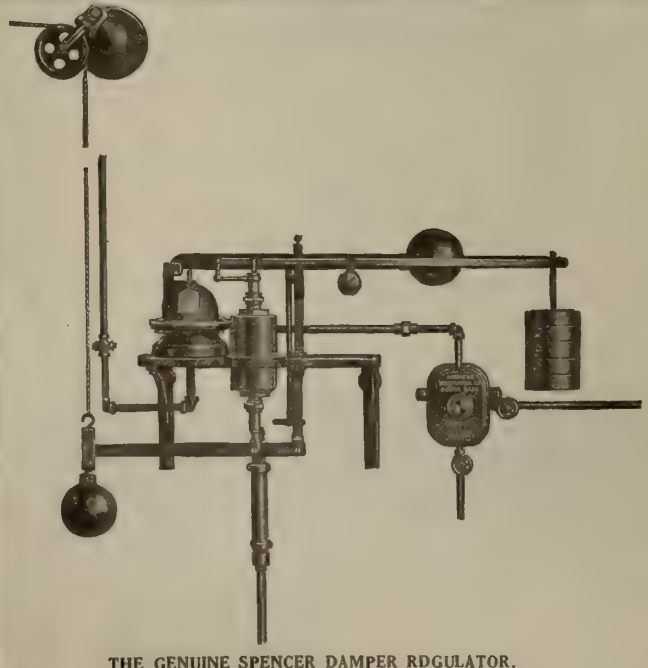
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VOL. XVIX. **GARDENVALE, P. Que., September 1st, 1921.** **No. 35**

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press. Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

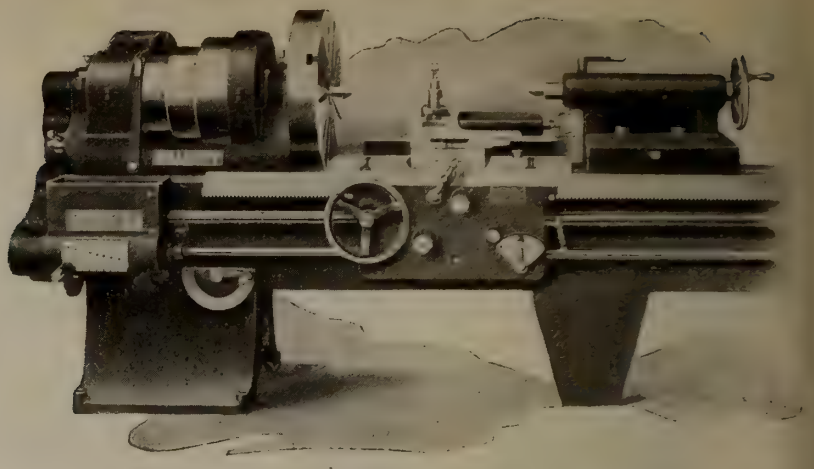
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EDITORIAL

SHIPPING PULP BY WATER.

An interesting possible development in the transportation of pulp from Canadian mills is suggested by the satisfactory results recently obtained by the Bathurst Company Ltd., in shipping pulp by vessel to an American port, in and near which are several paper mills. The advantage of shipping in this manner is evident when the cost of $4.00 per long ton for delivery to Philadelphia by water is compared with the charge of $14.00 by rail. Our information does not specify whether payment in American funds enters into the matter but in any case the advantage appears to be very largely with the water route.

Many people apparently fail to realize the very great transportation advantages which could be made use of by the fortunate geographical situation of most Canadian pulp and paper mills. By far the greatest part of pulp and paper in Canada is produced within 50 miles of a port or waterway that will permit the loading of ocean going vessels. There is probably no country in the world which produces as much pulp and paper under such conditions. It is also probable that no country has availed itself less of the advantages of available water routes. The action of the Bathurst Company, largely forced upon them by the large discrepancy between freight charges by rail and by water, will cause other concerns to consider the possibilities of following their example.

There was a time when by far the largest part of freight shipments, and most passenger traffic as well, went by water. The introduction of the railway brought in a more prompt dispatch in most cases and enabled the railroad to compete successfully with the steam boat. Recently however, there has been an increase in rail transportation costs rather out of proportion to increases by water. The advantages of speed and in some cases perhaps also ease of packing and loading into cars may partially or perhaps entirely overcome the handicap of expense and there are of course, inland points that can be reached only by rail. In some instances however, it may be possible to combine water shipment and railway transportation to obtain more economical delivery of goods. The likelihood is that water shipments will remain largely a matter of handling pulp because of the need for more expensive packing of paper to meet the requirements of the methods of handling paper aboard ship. There has been a very great increase in the world's available shipping since the war began and there has been a general decrease in railroad equipment although there is more than enough for the present diminished amount of business because of the general depressed condition of affairs. This excessive shipping seems to have had a greater effect on shipping rates than has been the case with railroad accommodation and it seems like a good field of investigation for Canadian producers as a means of getting their goods on the market at a lower rate by shipping directly by water or by shipping to a convenient port and dispatch thence by water to destination.

A further tendency which may develope because of the discrepancy of rates noted is that we may see more and more industrial development at points convenient to ocean shipment.

MEN REQUIRE LEADERSHIP.

The history of the world is a composite biography of leaders. The successful leaders and the ones whose names live as benefactors of the race, are the ones who have not only had a great personal stake in the outcome, but who have looked on their work as a means of wider service. Leaders are required in industry as surely as in politics, war and religion. The present unrest in industry is largely due to a desire to discover whether our leaders shall be men elected because of their popularity and self-assertion, or men who have grown into positions of responsibility by virtue of their ability, application and sacrifice. The former have little or no stake in the industry they seek to control. They know comparatively little about it from actual personal work, in fact in many cases they are not, and have never been, industrial workers. On the other hand, successful leaders of industry, organisers of business, have themselves filled minor positions and have proved their ability by application to their job and by studying the factors which affect the business. They have invested themselves in their work and have not only the maximum personal stake in their business but have a keen sense of responsibility both to the public and to the various members of their organization whom they endeavour at all times to keep occupied and paid.

A successful enterprise is however, but half accomplished when a qualified leader is found. The other half of the success depends upon the loyalty and hearty cooperation of the members of the organization. It is necessary that all work for the success of the whole, it is necessary to realize that the success of the individual depends upon the success of the whole enterprise. The Russian people failed to realize this and the collapse of the Bolshevik dream is doubtless due quite as much to the failure of the people to get behind and co-operate with the leaders as upon the lack of ability and the misguided policy adopted by Lenin and Trotsky. Communistic attempts to operate industrial concerns by elected committees have invariably failed.

Industry is much safer in the hands of experienced leaders than under the direction of the most popular and smooth spoken of egotistic wouldbes. This truth is borne out by the experience of more than one mutinous crew who, having deposed the skipper, found themselves entirely unable to navigate the vessel. The safety of our industries and with it the possibility of continuous employment for those engaged therein, depends on hearty co-operation with the qualified leaders who have learned how to navigate the seas of commerce and is quite impossible of attaining by anything in the nature of mutiny.

It must be kept constantly in mind by those who would seize the ship, that the present captains in almost every case can be said to have "shipped before the mast" and that their success can be duplicated in open competition by the same methods that have brought it about and continually at the same time improved working conditions for the employee, namely application, education and loyalty.

COBWEBS.

The questionnaire may be looked on as a bugbear or as a form of service boomerang. The member of an association who fails to fill out and return promptly a questionnaire sent him by the secretary is spiting himself. He is deliberately decreasing the efficiency of his organization and the benefits he will receive. Results tabulated from answers to questionnaires are reliable only when they are complete. That means pay attention to them. We refer particularly to the letter just sent out by the Secretary of the Cost Association. This association can be of inestimable benefit to the industry if given proper support. You can't sell intelligently nor compete successfully if you don't know your costs. The association helps you work accurately.

It is very interesting to read the names of officers recently elected to the *International* Union of electrotypers. Every office mentioned was filled by the election of an American and the annual meeting took place in a Canadian city! There is a growing movement toward the organization of Canadian workmen in Canadian organizations. Is it any wonder?

During the term of office of the last Governor General when one spoke of something "the Duke" had done, there was no question as to the person referred to. Since the advent of General Byng, however, it will be a bit ambiguous to refer to "the Lord."

We do not wish to appear unduly critical of our contemporary, the Paper Mill, and we should not be accused of boasting in remarking that the *exclusive* story on the front page of their issue for August 20th was substantially the same as the account published several months ago in the Pulp and Paper Magazine.

The appearance of the Canadian Forestry Magazine is well worthy of mention. The last number appears in a new size which coincides with that adopted by most technical magazines. The editorial matter and press work are maintained at the highest standard.

Average wages in ten industries showed that the German receives $5.99, the Frenchman $9.91 and the American $29.13 per week. Figures are not just at hand for the same industries in Canada but general comparisons indicate very nearly equal wages on both sides of the line. We have here a clear indication of what may be expected with regard to successful competition with Europe. Our only chance is cheaper raw material, cheaper power, smaller profits, greater efficiency, and, made possible by all this, wages lower in proportion.

WHEN TO STOP ADVERTISING.

The head of a large organization declared the other day that he had decided to stop advertising because the amount of business derived directly from it was not satisfactory. He received this reply: "Are the orders coming in from your salesmen satisfactory at present?" He admitted that they emphatically were not. "Are you going to lay off all your salesmen?" he was asked. "Certainly not," he replied indignantly. "We've got to have our men out to keep in touch with the trade". Yet he had decided to stop the very thing which keeps his company and its product in touch with the trade and the public in a far more comprehensive way than his salesmen can possibly do. It is just possible that he will now change his mind.

The time to stop advertising is not when orders become extremely difficult to land and when plants sorely need business to keep them going. If an ambitious advertising program can increase the percentage of production even moderately, it thereby reduces the overhead per unit of production. Moreover, it reduces the number of employes that have to be laid off, and this ought to be a consideration of the first moment in times like these.

Don't sit back. Sit up. Don't give up. Go to it.—Forbes' Magazine.

WHAT CANADA BUYS.

Referring to Canada's large and growing exports, especially of manufactures, as an "extremely creditable showing for a comparatively sparsely settled country covering half a continent and with a population of only 8,370,000 scattered over its 3,730,000 square miles," The National City Bank, N. Y., continues:

"Geographical and climatic conditions will always make Canada an active market for many products which the country itself cannot produce, or cannot produce in sufficient quantities to meet the requirements of the home market. The following summary of the principal imports into Canada for the same period as the exports named above shows that the following purchases were made by Canadians from abroad: iron and steel, $193,000,000; cotton, $127,000,000; sugar and molasses, $95,000,000; wool, $89,000,000; anthracite coal, $33,000,000; bituminous coal, $43,000,000; silk, $42,000,000; vehicles, $35,000,000; breadstuffs, $29,000,000; chemicals, $26,000,000; hides and skins, $22,000,000; rubber, $21,000,000; flax, hemp and jute, $19,000,000; tobacco, $16,000,000; leather, $16,000,000, and tea, $11,000,000.

The Renaissance of Straw Pulp and Paper

By MARTIN L. GRIFFIN, Technologist, North Dighton, Mass., for many years chemist of the Oxford Paper Company.

This article, which is reprinted from the Paper Mill, should be very encouraging to those who have the vision to foresee the possibilities in the vast amount of straw annually destroyed in Canada. It forms a suitable preface to a comprehensive orticle on the structure of straws, which will begin next week.

In the search for relief in the present shortage of paper and the increasing scarcity of raw materials, we may profitably review briefly the history of straw pulp and paper.

The manufacture of paper pulp from cereal straws dates back to very early times. It was perhaps the raw stock from which paper was first made. If this is true it follows that straw naturally suggests itself as a suitable paper making material.

The history of any process begins with the simplest forms and gradually develops into the more intricate and complex, and the products resulting are more valuable and beautiful. This is strikingly true in the development of paper manufacture. The making of paper then was a very simple art at first and the product crude.

Modern processes have become very complex and chemistry has entered very largely into making of paper from wood, where originally mechanical force only came into play. Of the two great agents, mechanical and chemical force, beating and dissolving, the former is chief. Paper can be made from any fibrous materials by beating in water, but not by purely chemical action. The real essence of paper making, therefore, resolves itself into a very simple operation which can be performed, and was originally, by simple manual labor. In the progress of the process, mechanical power and then chemical, came to be substituted until we have come to believe that paper can only be made by very large investments of money and other resources. So it came about that huge concentrated quantities of natural resources have been sought to feed the modern giant machines, with all the social problems entrained which now confront society.

Within the bounds of one generation we have stripped our forests of harvestable timber, till there is a cry for paper, and lumber for houses to live in which cannot be satisfied. We are about to repeat this experience in the wanton use of another natural resource which cannot be replaced. The giddy rate at which petroleum and its products are being exhausted is at its height now. Other instances might be cited.

What is the remedy? The remedy must involve the habits and customs of the people. Individuality and the fruit of individual labor have been absorbed in the great organization wheel in which mass action and conformity dominate.

Raw materials and labor are sorted and graded in large quantities to fit the machine. Small issues, no matter how important as such, are turned into the discard and personal responsibility is at a discount. There is little connection between the fruits of labor and what is called "wealth" today. Our civilization is threatened with social and industrial problems which will tax our best brains to solve.

How well then, we shall live in the future, depends much upon how hard and skilfully, how honestly and faithfully we are willing to work. If half the lumber consumed in making paper during the last ten years had gone into the building of houses for the people, we should not now be forced to live in restricted quarters and cry out against profiteering landlords. Extravagant quantities of wood from the forests converted into paper and given over to yellow journalism and costly advertising, flit about in the busy life of the time, like moths around a candle, and in a day is lost forever, and who has benefited? It is like a joyride, nothing but artificial exhilaration at the time, and weariness afterward. This lumber used in building homes for contented people would endure for 100 years.

Of late popular interest in the use of straw for paper is reviving and I know of no source of raw materials which can help tide over the shortage better than the cereal straws. There are no experimental risks involved. Before the day of wood pulp, straw was the principal source of our cheap papers and small mills using straw were numerous in New York, Ohio, Indiana and Illinois. For many years the industry has led a struggling existence and many mills have taken up other lines or fallen in ruins. At one time straw paper was of such importance that it formed an important division of the American Paper and Pulp Association and I well remember the reports at the annual meetings which Mr. Van de Carr made from year to year, as wood pulp gradually displaced it and absorbed the market.

Of all the waste fibrous stalks which have been exploited for paper, the cereal straws are the most valuable, abundant and best known, and are the only ones, so far, which have been used with commercial success. Next to wood they are the most universally distributed. They are quick growing and the period of harvest is long, depending upon the latitude and the time of sowing. On this account they have a great advantage over other crop stalks, like sugar cane, corn and cotton, even if they were well adapted to paper making.

Two kinds of pulp have been made from straw. The first and most common is straw wrapping, made by digesting or steeping straw in milk of lime until it is well softened. It is then washed, beaten and run over the machine. This process is capable of several refinements both in the cooking and beating which will give it a better market.

Milk of lime is a weak alkali and does not act vigorously enough to dissolve much of the incrusting matter and the paper is therefore hard and woody. If stronger alkali is used in the cooking, the pulp will be cleaner and a better paper can be made from it, but the yield will be less. The proportion of soda ash or caustic soda may be increased until it becomes what is known as the soda process, chiefly used in cooking woods of certain species. Such pulp is called chemical pulp and is bleached and used in writings and high grade book, and possesses some qualities superior to chemical wood pulps.

The yield from straw is from 75 per cent down to 40 per cent depending upon the cleanliness of the resulting fiber.

The process of making straw wrapping is simple and does not require a large investment in plant nor much labor. Small plants can be erected anywhere near a fuel supply and a small stream of water. Enough straw can be produced within a short distance of the mill to keep it running all the year around.

By reviving the industry, the way will be opened up which will lead to a greater expansion naturally. Straw wrapping paper should now begin to regain its lost prestige and replace wood pulp in such papers, and conserve the wood for those uses where at present straw pulp cannot be used.

I believe the time is at hand when attention should be directed to straw as a source of chemical pulp for book papers. Poplar wood for the soda process is becoming very scarce and other substitutes are being sought. The manufacture of straw cellulose in European countries was carried on extensively before the era of wood pulp. The process is essentially the soda pulp process adapted to straw and very much like the manufacture of pulp from esparto grass in England and Scotland. So thoroughly has this industry established itself that esparto pulp and papers have never been displaced by wood pulp, notwithstanding the fact that all the grass must be imported from Spain and Africa and the ultimate yield is only about 40 per cent. On account of transportation costs and the hitherto abundant supply of wood, esparto has never been used in the United States. If straw was now as abundant in the region where paper is made as it is in the great agricultural States of the West, I believe it would have come into more general use. The time will come, if it is not already at hand, when the use of straw for paper will become a large and valuable industry in the Northwest. All that is now needed is the vision of a few far sighted men, who know something of the manufacture of paper themselves, or possess the ability to get them.

It is surprising that our government laboratories have not realized the value of the cereal straws for paper making, but have devoted most of their energies to the further exploitation of other species of wood and to waste stalks which give little promise of success.

There are two characteristic features of straw which have to be carefully taken account of, in the conversion to chemical pulp, the knots or joints and the silicious matter. The knots being much harder and more impervious than other parts of the stalk, require more severe treatment to reduce. They must be eliminated, either in the cooking, or by screening afterward.

The presence of considerable silica in straw is a source of some annoyance in the soda process. It dissolves in the cooking liquid forming sodium silicate, from which the soda cannot be recovered. It also forms a troublesome scale on the tubes of the evaporators in the recovery process. The difficulties do not preclude a successful operation of the process but they must be reckoned with.

I do not know that the less commonly known sulphate process has ever been tried out in the reduction of straw, but inasmuch as it is not calculated to produce a high grade of pulp, it would not be advisable to attempt it.

If straw is ever to be used extensively in making news print, I believe the sulphite process must form the basis for doing it. The characteristics of pulp for news are, strength enough to make safe running on the machine and press, and to stand the reader's handling, short flakey pulp, like ground wood for filling, requiring very little beating and of a fair white color. Such stocks now compose news print paper and the news mills are set for them. Two processes are required to produce them; the sulphite, making the strong pulp, and the grinder, the short pulp. In straw we have the components of both pulps, both of which can be made available by the sulphite process in one product. It has been known for a long time that the fumes of sulphur will whiten straw and it has been a common practice in other trades.

In the nature of the case, therefore, the sulphite process is adapted to the treatment of straw for news print paper. Slight references to the use of this process on straw are to be found in the literature of the subject, but no interest in it has been developed.

In 1908, during the pulp and paper hearings before a Congressional committee, Nathan Cobb, an expert technologist in the Department of Agriculture referred to the possibilities of this process as applied to straw, and stated that experiments ought to be made, but none has ever been made that I know of.

In the treatment of straw, what is wanted, is first a mechanical treatment which will cut it up and disintegrate it, including the knots, and convert it into a short broken fiber chaff. Second, a digestion under pressure with a cooking, scouring, bleaching liquor. This is a perfectly simple and easy thing to do, but nobody has thought it out. Since the days of Alexander Mitscherlich, whom I believe was the greatest sulphite expert the industry has ever produced, everybody who pretended to know anything about the business has been reducing the alkaline base and increasing the "free acid." He used an acid containing 2.5 per cent base. The common practice now is less than one per cent. He obtained maximum yield and strength. We sacrifice both of these for production.

I make this reference to show that the sulphite industry has adapted the extreme acid side for cooking liquor at the expense of yield and strength. If we are to produce straw sulphite, a more alkaline liquor should be used. It is an easy matter to make a cooking liquor with two distinct functions.

I have indicated how easily and with what little investment small mills can be built and operated in the regions where straw is, to make cheap wrapping paper and plants to make sulphite straw need not be large or complicated or require huge investments to be made successful. The conversion of the pulp into paper will require an up-to-date paper mill, but there is a place for the small mill well located today.

I have, on many occasions, affirmed that wood has no substitute for news print paper comparable with it, and that everything possible should be done to conserve and restore our resources of the forest, but I maintain that we must not quit and make no effort to bridge the gap.

I have criticized the press and politicians for trying to make capital out of many substitutes for paper pulp which we all know are nothing but dreams, but if they will create a general interest in developing an industry in straw paper they may count on my hearty support.

Employee. — I don't like your methods of doing business, Mr. Grafton. I resign.

"Practical" Business Man (sneeringly). — You're a holier-than-thou guy, eh?

Employee. — No; merely a square peg in a crooked hole. — Puck.

Salesmanship*

By B. SPROULE, Toronto.

A great deal has been said and written about selling. Personal appearance, manner of address, and methods used to obtain the buyers interest in your proposition, these things that go to make up personality are just the trimmings. If a man has not honesty of purpose, thoroughness and a sincere desire to give real service he cannot expect to accomplish anything really permanent.

It pays to give considerable attention to personal appearance as a good appearance will often open doors that can only be opened with great difficulty by a careless man. I had a practical demonstration of the value of good appearance some time ago; I happened to be in the building which houses the Standard Lithographing Co. and while there I thought I would call and see Harry Reeder. I asked if he was in and the clerk asked who would he say wanted to see him, and I said "Mr. Sproule". When I got into the holy of holies he was standing up all ready to receive me, and when he saw who it was he nearly laughed his head off. I said, "Say Harry, what is the joke?" He said, "When the man brought your name in, I never thought about you and I asked him what kind of a looking man was he", and the clerk said, "Not bad but a very prosperous looking person." Personality is a great help. A pleasing manner, a good address and good appearance all make selling easier.

A salesman's approach greatly determines his success or failure. Many a man throttles his chance of success by being too perceivably filled with his own importance, and after he has finished his introductory speech of all he knows (which as a rule takes a long time, but could be given in one breath) he would leave the impression that there is little else worth knowing.

Self conceit is not self respect. Every paper box salesman should have his full measure of the latter, for he sells a line required more today than ever, but he should be careful not to conflict such respect with an antagonizing conceit. Most men admire a respectful salesman, who, yielding due deference to the buyer, carries with him a strong conviction of the worth of his line and the belief that he can serve.

Selling is service, not unloading the manufacturer's product upon the buyer, and not by any means a price competition to determine the transaction. Many manufacturers are almost entirely to blame for the evil of price cutting, when at the same time they are most anxious to overcome it. They do either of two things:—

1. Put their salesman on commission or

2. Determine his worth to them by the total of his sales.

The result is often the passing of much more of the manufacturer's product to the buyer than is immediately necessary, and a great scarcity of the personal service between the salesman and customer. In the end a lack of confidence is inspired. It seems natural to conclude that the freer a saleman is to serve the customer with his time, advice, co-operation, suggestions and experience, the more confidence would he engender and the more able to sell regardless of price. The salesman should not be encouraged to sell goods at any price. Which is the more valuable, the man who makes a large total of sales at a low margin of profit or the salesman who works to win the confidence of his customer and sells his service along with the manufacturer's product at a margin of profit unquestioned, because of such confidence?

In our plant we expect to do about $30,000 of business this year that we have created by designing boxes for our customer, which enabled him to create and get business he might not have got otherwise. If salesmen would only look at the proper angle and convince the customer that they are not selling boxes but the contents of the box, that by designing a box and making it so attractive that it will sell the article, the sale of the box automatically takes place, for the greater the sale of goods the greater the sale of boxes.

For instance, the salesman is calling on a man who is going to put out a new article, now the salesman should get all the information he can about the history of similar packages, their success or failure, the particular advantage this shape would give, also the attractive color scheme that would enrich the appearance of the package, the particular color that would give the package an individuality, also the advantage of adopting a trade mark.

A trade mark or trade color has great advantages. For it is a well known fact that in South America the natives buy goods by the pictures, for example, they will call for Indian Head Hatchets, Star Brand Soap, Eagle Brand Shovels, etc.; and also the effect it has on children's minds, who can remember the pictures before they can read the words.

Salesmanship has been spoken of as an art. If it is one of the lost arts for it is not known in the paper bax industry. For at the prices that boxes are sold today there is no salesmanship used. During the period of prosperity we have just passed through, salesmanship got lost in the shuffle and the production man was the big noise, and the man who took the order or allowed the order to be placed with his firm was called a salesman, but to my mind the species has become extinct. Why are we selling goods at the ridiculous prices that they are being sold at today? Is it the fault of the salesman or is it the fault of the boss? I think the fault is the boss's in a great number of cases. For in his over-anxiety to get new business, he gives the salesman prices that are not fair to the salesman, because it creates in the mind of the buyer the thought that all he has to do is to say that he has got lower prices and the salesman wants another chance to revise his figures, which destroys his initiative and creates paper box salesmen of such a low standard of salesmanship that they will be of a class equal to the handy men of the mechanical trades, developed by specialized war production, that are such a glut on the labor market today, who are neither mechanics or laborers, and who cannot fit into the general scheme of things as they are at present, and are unable to earn a decent living.

Here is an example of salesmanship that occurred just recently in Toronto, a so-called salesman called on a user of paper boxes and was informed that the buyer had just gotten a supply of boxes sufficient for some time, from a house whose service is good, boxes acceptable, and the price never questioned, on account of the confidence built up by the salesman who was serving

* Address delivered at the annual meeting of the Canadian Paper Box Makers' Association, Hamilton, Ont., June 23, 1921.

him. He requested the privilege of quoting and being assured of their present satisfaction in their boxes and the plentitude of stock on hand still persists in quoting. He gives the quotation, safe in the knowledge that boxes are not required immediately, but quotes with the purpose of getting a place in the sun, a figure of $12.00 M. the firm supplying the boxes at legitimate price of $24.00 M. Now what is the result of this quotation? The buyer in this case knew that the price was ridiculous, that he would not be able to deliver the goods at the prices stated, and immediately decided that the salesman was no good and that the house he represented was not reliable, and a good house not to do business with, and this particular firm will never be able to even give a quotation to the house in question, in the future. We can all realize the great amount of harm that the industry suffers from cases of this kind of salesmanship.

The trouble in the paper box industry today is too much selling of prices and too little selling of service at a profit. This is the time that the paper box industry should be placed beyond the period of price selling and should encourage its men to be salesmen that will be good profitable trade builders to the house they represent. Real salesmen that can earn real salaries and be valuable assets that the salesmen should be to the institution they represent.

OPERATIONS BEING RESUMED IN HIGH GRADE MILLS.

Resumption of operations by some of the high grade paper mills on a broad scale is reported to the American Paper and Pulp Association, these reports coming from various sections of the country. Several large producers in New England are steadily increasing their output now that the low point has been reached.

Following the recent and various individual downward revisions in the price of high grade paper, liquidation is apparently complete in the Writing, Book and Cover paper markets and as a result buying is increasing.

While these prices may not have returned to their pre-war level, they are down to bed rock so far as costs are concerned. With contract bleached sulphite selling at 4¼c and other pulps down in relative values, with rags only 3 per cent higher than 1913 prices, with wages reduced to the lowest possible minimum and with coal still high, the mills are faced with fixed costs for a number of months and have gone the limit in the reduction of their prices. Furthermore, these prices contemplate increased production, because at the present low rate of operation they represent in many lines a distinct loss.

In comparison with costs, high grade papers have liquidated more in their prices than shoes, finished cotton goods and textiles, the factories of which are in operation with good demand since the public feels these prices to be on a satisfactory level. High grade papers, having gone to, and below, this level, are now also increasing in use with the return of confidence on the part of the merchants, printers and public.

The little savings bank in the home means more for the future of the children of a family than all the advice in the world. It gives them the right start.—William McKinley.

We should remember that we can earn most with two good eyes, two good hands and two good feet.

PAPER BARRELS TO BE MANUFACTURED

At the Montreal Rotary Club last week, Mr. Art. Harries, president and manager of the Canada Paper Box Company, gave an interesting talk on the uses which paper has come to be put to in the manufacture of boxes and containers for packing and shipping goods, with a word of explanation as to the process of manufacture.

He mentioned that the manufacture of the solid fibre container was primarily introduced by his firm in 1914 and that since then three or four other factories had engaged in such manufacture, and that, in normal times, there was room for even more. This container which can be packed away in sheets in comparatively limited storage, he said, had taken the place of wooden boxes to a very large extent, and had proven its serviceability for shipments abroad, with transfers from rail to ship and vice versa, largely on account of ability to resist damage from water.

Mr. Harries exhibited samples of the paper from which the containers are made and explained the machine processes. In this connection he intimated that his firm is about to embark in a new departure in the manufacture of paper barrels, in which they would be the pioneers so far as Canada is concerned, although the paper barrel is not altogether new in England and the United States. Mr. Harries also showed samples of the barrel they proposed to make, suitable for the shipment of flour, lime, dyes, sugar, butter, lard and other goods. As a demonstration of the resiliency of these barrels he challenged any 200-pound Rotarian in the room to stand on the bilge of one—the barrel being without the support of its heads—an invitation which was accepted by a member who scales something over that mark. The barrel showed no signs of yielding whatever. Now what would have happened, Mr. Harries asked, if the same member had stood on the bilge of an ordinary flour barrell with the heads out of it? Mr. Harries said his firm was now preparing to instal the necessary plant for manufacturing these goods.

CANADIAN INTERESTS NEGLECTED.

A recent article on the pulp and paper trade and other matters by Mr. Edward Beck, leaves it to be clearly understood that there has been a serious neglect of Canadian trade interests in government negotiations, or rather perhaps in the absence of desirable government negotiations with Australia. "British paper-makers," said Mr. Beck, "expect to benefit by pending tariff legislation which undertakes to give protection to certain so-called 'key-industries' in Great Britain, among which paper-making is classed. They have also recently been granted a substantial tariff preference by Australia, and are out to recapture that market which was largely supplied by Canada during the war. It would be interesting to know how Canada came to be excluded from this preferential arrangement, since it was only a few months ago that the Australia Trade Commissioner to the United States, Mr. Mark Sheldon, in a trade conference in Toronto, declared that Australia would be perfectly willing to extend such a preference to Canada if Canada would give reciprocal concessions."

The Canadian paper business is not by any means at the present time in such a condition of surpassing prosperity that it can afford unnecessary and unjustifiable neglect on the part of those whose duty it is to have a due regard for the trade interests of the country.—Quebec Telegraph.

The New Sulphite Mill at Cornwall

One of the first mills to make sulphite pulp in Canada was that of the Toronto Paper Co. in Cornwall, whose president, the late John R. Barber, made a trip to the Kellner mill and having satisfied himself as to the value of the new fibre, contracted for the necessary plant for its manufacture. The principal article required was a digester, in which the spruce wood is cooked along with sulphurous liquor, which removes the resin and converts the wood chips into pulp, subsequently bleached and otherwise treated till it is finished as a clean white sheet.

Floated Digesters up the River.

The first digesters were made at Duisberg-on-the-Rhine, Germany, and were brought to Montreal on a steamship. The question of conveying these huge monsters to Cornwall was a problem, as there was no means of loading them on a railway car, if one could have been procured equal to such a load. This was solved by plugging up the manholes and dumping the digesters into the St. Lawrence, where they floated nicely and were towed to Cornwall. The hauling of the big boilers up the canal bank from the tail-race of the paper mill was another big job, but was accomplished at last by the ingenuity of Big Mike Keenan.

The digesters were got into place, together with other machinery for barking the spruce logs, sawing and splitting them and turning them into chips. It took a good while and a good deal of money and experimenting to turn out good pulp, but is was at last accomplished, and numerous improvements were made in the Kellner process. This was in 1888, and the old pulp mill has been working continuously ever since till the present time.

A New Big Mill.

When the Toronto Paper Co. was merged in the Howard Smith Paper Mills, one of the first moves of the latter concern was to prepare plans for the erection of a new sulphite mill on a large scale, with a capacity several times as great as the original mill. The main building of the new structure is 30 x 80 feet and 110 feet high, and contains four digesters, with a capacity of 70 tons of bleached pulp per day. One of these digesters was built by the Dominion Bridge Co., and was completed by them at their works at Lachine; the other three, on account of their larger size, were shipped in sections from Manitowoc, Wis., and riveted together where they now stand. The process of chipping the wood is improved and simplified, the logs coming in a continuous stream, and automatically dropping into the chipper. From the chipper the shredded fragments are conveyed to a sorter, the larger pieces being separated to be further reduced in size, the smaller passing through revolving sieves, which take out the dirt and sawdust. Elevators convey the chips to the digesters, where they are boiled with sulphurous liquor, and the mass is then blown into the drainers, thence being conveyed to the wet press, which forms the material into sheets. It then goes to an hydraulic press, and when a large proportion of the moisture is removed and the pulp is then ready for shipment or for use in the local mill. The sulphurous liquor is made by burning sulphur in a revolving burner, the gas passing into two high towers, filled with limestone and water, and from thence goes into the digesters. The Jenssen process is employed. A separate building is provided for this purpose. The old pulp mill is being fitted up for the Bellmer bleaching process, and will be completed shortly. It is intended that all the mills controlled by the Howard Smith Paper Mills shall use sulphite pulp from the Cornwall mill. A new mill is also almost completed for the manufacture of chlorine gas for bleaching, by the electrolytic process, which will also supply the various Howard Smith plants.

Interesting Features.

A very interesting feature of the new plant is a filter, through which all the water used in the manufacture of paper, and that is a lot, passes before being used in the various processes. It is a concrete building, in which are a number of vats, partially filled with gravel and sea sand. Water percolates through the filtering material and falls into a clear-water compartment. The process is continuous and automatic.

A new steam boiler house has been erected, with a stack 200 feet high, and a conspicuous feature of the landscape, with a complete equipment of boilers, all fitted up with the latest devices for the saving of labor, and economizing expense in every way.

For the moving of the heavy machinery and materials, the company has a locomotive crane of 15 tons capacity, which has rendered much easier the construction of the buildings and their contents, and will be of great service in subsequent operations.

The immense piles of pulp wood which occupy a large area give one a good idea of the magnitude of the operations of the new plant. These piles aggregate about



General view of the Cornwall Division, Howard Smith Paper Mills, Ltd.

20,000 cords, and are diminished at the rate of about 140 cords a day, representing the product of 10 or 12 acres of forest.

The Cornwall Paper Mills.

The first mill of the Toronto Paper Co. was built and went into operation in 1883, with one machine, still in active use. Four machines are now running, with an aggregate of 40 to 45 tons of paper a day. One machine is being rebuilt for the making of bristol board of high quality. The output of the mills includes writing papers, manillas and the finer grades of books and lithographic papers.

The original mill was erected under the supervision of the late James D. Finlay, one of a family of paper makers, who continued as manager for a number of years. There have been several managers since, and Wesley N. Tilton, a graduate of the mill from boyhood, and whose reputation stands high amoung the papermakers of this continent, is now in charge.

The first business manager was the late James Young, who was succeeded by W. J. Wallace, who still holds the same position, and is excelled by few in his knowledge of a highly technical business.

The enlargement and improvement of the entire plant has been conducted under the personal direction of Gerald M. Smith, M.E., and the completeness of the entire outfit, which is one of the best and most extensive in Canada, is the best testimony to his ability in that direction.

The Howard Smith Paper Mills Ltd. controls mills at Cornwall and Crabtree, Que., whose output includes almost everything in the way of paper of the better grades—the aggregate product being 120 tons daily.

The Cornwall mill has had a career of uninterrupted success, having always lived up to a high standard of production; it employs a large staff of well-paid workmen, has suffered very slightly from labor troubles, and is one of the sheet anchors of Cornwall's prosperity, contributing greatly to its reputation as the Factory Town.

The working force of the mill in Cornwall numbers about 400 men and women.

The officers of the Howard Smith Paper Mills, Limited, are as follows:—President, C. Howard Smith; vice-presidents, James W. Pyke and J. Alex. Cameron; secretary. Harold Crabtree; treasurer. E. Howard Smith; directors, D. W. Campbell, W. D. Robb, J. J. M. Pangman, Howard Murray; comptroller, T. P. Howard; local manager, W. J. Wallace.

BOOTH MILL SHUTS DOWN.

Ottawa, Aug. 28.—About 150 men were temporarily thrown out of work over the week-end, following the suspension of operations at the big paper mill of the J. R. Booth Company at Chaudiere. Business depression and a consequent lack of orders was given by J. Fred Booth, manager of the concern, as the reason for a brief shutdown. He expected that work would be resumed about the 1st of September.

Fifty men of the E. B. Eddy Company, who have been idle since Wednesday last, will be back at work tomorrow when that company's paper mill will recommence operations after a five days' shutdown.

SWEDISH DISCOUNT NOW SIX PER CENT.

It is stated that the Swedish Riksbank has reduced the discount rate to six per cent. The previous rate was six and one-half per cent.

MORE LIGHT ON LABRADOR.

Some light is thrown by the Sidney, N.S. Record on the rumor that 600,000 cords of pulp wood are to be exported to Holland. Referring to the exploration trip of H. C. Bellew and party to Labrador, to which reference was made editorially recently in the Pulp and Paper Magazine, the Record says:

"The party left Louisburg on July 14th and their purpose was to investigate and make a survey of a timber limit 148 miles square at Stag Bay for which they had already paid $20,000 deposit. The tract is situated on the Atlantic side of Labrador 350 miles north of the Strait of Belle Isle. The property is owned by P. G. McGrath, of St. John's, Nfld.

Mr. Edwards, speaking of the tract of land, says that there is no timber there worth mentioning. Even if the timber was there, he says, it would be of no use, for there is no water to float it on.

We paid $20,000 down on the land, Mr. Edwards continued, and were told that we would find the best of pulpwood timber, but we found nothing but scrub spruce. It is too cold there for anything else to grow. This scrub is absolutely useless for pulpwood.

Mr. Bellew will continue to look for a timber tract as he has an order from a frim in Holland, which he has to fill at once. This order, he says, is for 60,000 cords of pulp wood a year for the next 10 years, and another order from a United States firm is for 40,000 cords and a third for 10,000 cords. He will look into some timber tracts in New Brunswick next week. I would rather locate in this part of the country anyway, he said, and if I can obtain limits I will do so. He expects to employ between 1,000 and 1,500 men when work is started.

Mr. Bellew claims that the party lost about $30,000 on the Labrador deal. He has wirelessed the prime minister of Newfoundland that he will employ 1,000 men if he can obtain a timber limit in that colony. Speaking of this, he says that he has little hope of getting anything in Newfoundland as the British firms have all of the timber limits under their control.

WOOD CARGO AT OSWEGO.

With a cargo of 950 cords of pulpwood from the Gaspe Peninsula, the steamer Aragon arrival at Os-Gaspe Peninsula, the steamer Aragon arrived at Os-Canada a few days ago. The Aragon has been on the west coast trade for the past ten years and this is her first appearance in that time back on the Great Lakes.

The Meigs Pulpwood Company, which owns the pulpwood terminal at Oswego, has about 16,000 cords of wood cut, peeled and docked ready for shipment in the Gaspe country, but little more of it will be shipped unless business conditions in the paper industry improve.

B. F. Perkins & Son, Inc., Holyoke, Mass., manufacturers of the Mullen Paper Tester, Jumbo Mullen Tester, and Perkin's Mullen tester, have secured the services of Mr. Thomas Holgate as travelling representative. The firm feels itself fortunate in obtaining Mr. Holgate's services, believing that his experience resulting from his connection with varied industries will enable them to extend the best services to their customers.

If the boss pasted a ten-dollar bill on the bulletin board, would you stop and look at it? He pastes a good many hundreds of dollars there every year in the shape of Safety bulletins. Do you read them?

CONFIDENTIALLY—NOW'S YOUR CHANCE.

(Some Excellent Advice from the United States Paper Maker.)

The general acceptance of the well-known quotation concerning the direction of the young man's thoughts in the spring time makes it unnecessary to argue the question. Let it be conceded that in the spring the young man's fancy lightly turns to thoughts of love, even when, if perchance, he is in the paper business, he should be devoting himself to thoughts of selling a few tons of super, especially if his loving thoughts have got along as far as matrimony.

But at the spring passes and the summer gets into its swing, with the thermometer climbing daily, and pep departing in exact proportion, the fancy of most men, young and old alike, turns to thoughts of loafing in some particularly agreeable manner. Some prefer golf, which is one of the highly popular forms of getting a little light exercise combined with pleasure, while others yearn to fish but all find it more or less difficult to keep the old bean concentrated on labor, and this being so, efforts in that direction become exceedingly mild.

And an observer among paper men just now will find this tendency just about as strong as it ever was, or even a little more so, due to prevailing conditions. Although the efforts of some executives have been directed for some time toward impressing their sales forces with the powerful importance of hard work, the perspiration which is unavoidably connected with work during the dog days does not strike the average salesman as worth while; and the midsummer slump, therefore, which has all of the advantage of a first-class start accumulated through the spring, bids fair in many cases to receive important help from weary and indifferent sales work.

All right—if you feel that you might as well lay off and take it easy until buyers make up their minds to resume their proper function of purchasing large lots of paper, go ahead. If you take the view that there is no use in pushing for business when business has retired into a deep, dark hole, refrain from pushing. save in connection with some light and summery amusement. If you believe that there is going to be absolutely nothing doing, whatever, before fall, and that there will be plenty of business for everybody then, you probably wouldn't get much, anyhow, and you might as well get whateever benefit there is—and there's a lot, too—in a complete vacation.

But don't forget this, in the meanwhile, as you cavort on the beach or the fairway, or match wits with the wily bass: There are a few chaps in the trade who are putting in some of the hardest licks of their careers right now, and who are going to continue to do so everyday right along instead of waiting for a revival. Of course, they'll get their vacations, either between whiles, or later on. They'll week-end with ease and enthusiasm, too, and they'll manage to get in an occasional afternoon at a ball game or elsewhere. But in the meantime—oh, boy!

"Confidentially, I'm going to work my head off during the next few months," confided one of these lads not long ago.

He is representative in a good-sized territory of a good line of paper, and has had his share of the big business, so that it isn't as if he had to sweat during the summer to keep from starving to death. But he looks at things from a rather broad angle, and—queer duck—actually seems to like his chosen job of supplying the world with paper.

"You know how it is during the worst of the summer," he continued. "Lots of buyers are away, although not all of them leave at once, at that, as so many fellows seems to think they do. The vacation season is on, and I've met lads who seemed to think that that meant everybody should take it easy, whether apparently on the job or not. The weather is pretty mean, too, lots of the time, and it's a lot easier to piffle around, pretending to work, than it is really to work.

"So, everything considered, the usual summer let-up is no astonishing thing. It's just about as logical a things as you can find anywhere. It would be surprising, in fact, if no slump occurred, because effort slumps, and interest slumps, and I don't see, myself, why buying shouldn't. And when you consider how things have been lately, it looks like this summer will pretty nearly set a record in the matter of dullness, with most people. It is the safest bet I know of.

"And that is one of the several reasons why I'm going to put in some stiff licks myself. It's got to be done, in order to keep any sort of volume of stuff moving, and I aim to keep it moving, let me tell you. It isn't as if we were going to be shut down, with nothing to sell. I know that you hear now and then the suggestion that it might not be a bad idea to do just that. Regardless of that, however, the fact remains that we're going to keep running, and that means that I've got to sell paper.

"But here's my idea: It's going to be easier to sell paper this summer than it has been for several months past, and there is going to be less competition, as far as I can see—provided the usual summer let-up in effort and interest comes—than usual. How's that for a size-up of the situation? I don't mind giving you my dope, either, for what it is worth, and you can wait and see how nearly right I am.

"Stocks everywhere are low; in fact, you could say that there aren't any stocks, compared with a normal situation, and not be very far wrong. Consumers who usually have on hand a lot of the various papers which they need haven't any. They are buying in small lots instead, getting immediately delivery, and getting along that way. By the same token, the average dealer is doing exactly that same thing. I've known cases lately where dealers who usually have carloads of a given grade on hand had simply passed on to a mill an order for a few reams. That shows you where stocks are, doesn't it? There ain't none, so to speak.

"All right; you can't argue with that fact, simply because it is a fact. Take the next thing, which is the reasonable expectation of a fairly good fall business in various lines. Everybody may be wrong in looking for it, but considering the limited supplies of goods of all sorts, the small volume of business which has been handled practically ever since the first of the year, and the ordinary necessities of the country, I don't see how we can fail to get something of a livening up during—and in advance of—the fall. And that, of course, means paper.

"That makes a fairly simple situation, it strikes me—a complete absence of supplies in the hands of buyers, and a practical certainty that in the very near future those buyers are going to begin, cautiously, to replenish their exhausted stocks. Now, with a lot of the boys whom Icompete with, and from whom I get competition, practically laying off for the rest of the summer, I figure that a fair-to-middling pace on my part will

look like lightning. Anyhow, I'm going after business, and if I don't bring in the orders you can feed me crow, that's all."

After this base betrayal of the confidence of a good paper man there is no harm in adding the suggestion that a revival of buying will, in all probability, catch the average salesman far, far from base. He may find himself tagged out before he knows where the ball is; whereas, of he keeps careful tab on the situation, keeps close to his customers, and to conditions in the manufacturing end of the game, and, above all, on general business, he can take his two weeks or so with a clear conscience, and with the knowledge that things are in good shape in his territory.

The significant basic facts are certainly as indicated above. Stockrooms and warehouses are practically bare of paper, and there are plenty of wise buyers and company heads in consuming lines who are planning a gradual but steady campaign of replenishment, with the idea of getting on hand at least a part of the paper needed for normal use and averaging its cost, whether the market goes up or down. In any event, they will have paper.

And the salesman who in the sweltering dog days —they are not all so bad, at that—has the grit to keep plugging, and the sense to put his customers right as to their paper requirements, is going to get considerably more than his share of the business which is exactly as it should be.

ABITIBI CIRCULAR ON PHYSICAL CONDITIONS.

An interesting circular on Abitibi Power and Paper Company has been prepared by R. O. Sweezy, B.Sc., M.E.I.C., and issued by the Stock Exchange firm of O'Brien and Williams. Mr. Sweezy personally visited the properties and mill of the company. The circular says, in part:—

Built in 1913 and 1914 the Abitibi plant at Iroquois Falls had a rated capacity of 225 tons a day of newsprint paper. The enlargement now about completed, gives the plant a daily production of 500 tons newsprint paper, and a surplus of ground-wood and sulphite pulp sufficient for an additional 100 tons of newsprint paper.

It will probably be a few months before the daily production of the whole seven machines exceeds 450 tons, but it is probable that in due course the same machines can be tuned up and improved to produce 600 tons of newsprint a day, besides the 25 tons of wrapper to be produced on an eighth machine.

A further increase beyond this of 100 tons daily is possible in the groundwood plant by the addition of grinders which can be operated from surplus power available.

Until completion of the new power development some 20,000 h.p. has been supplied from the Iroquois Falls under a head of 42 feet. The new power just developed under a head of 57 ft. at Twin Falls—four miles distant above the mill—will supply 25,000 h.p. besides improving the regulation and output of the Iroquois Falls power. The two power plants combined can now deliver a minimum of 47,000 h.p. and space is provided at the Twin Falls power house for an additional unit of 6,000 h.p. The Lake Abitibi storage reservoir of 400 square miles, 9 feet deep, is controlled by the Twin Falls power dam. Further storage of some 40 square miles, 18 feet deep, is available for development at low cost.

With the proper tuning up of the three new machines (Nos. 5, 6 and 7) during the next few months the effect of the new extension will have been to increase the newsprint production by 2½ times—a feature that may soften the adverse effect of the splitting of the company's shares on a basis of 5 to 1. Thus in relation to production this ratio becomes 5 to 2½ or 2 to 1. The increased production should also have the effect of decreasing the cost per ton of paper.

The company owns 1,500 square miles of forest in the Abitibi watershed. The stumpage rate is 40 cents a cord of 115 cubic feet of solid wood payable as and when cut. This is $1.00 a cord less than stumpage dues in Quebec Province—an advantage that means nearly $250,000 a year on the Abitibi Company cut. In view of the greatly increased production, negotiations are now in progress where the company expects an additional grant of 2,500 square miles of forest. The total of 4,000 square miles will give them about 13,000,000 cords of pulpwood, which, together with wood available from the Quebec side of the Abitibi basin, places the company in a secure position for all time.

At a time when pulp wood was costing $20 to $30 at most Canadian mills, the Abitibi Company could obtain its wood for $12 to $16 a cord at mill. As it takes a cord and a half of wood for a ton of paper it is obvious how such a difference in cost can affect earnings.

Some advantage will be found in the fact that pulpwood supplies which have been carried in abnormally large quantities during the uncertain period of rising prices can now be greatly reduced in relation to output, whilst this item will be further eased by much lower wood cost. That is, the amount of working capital required per ton of product will be very much reduced by reason of falling prices.

CHINA AWAKENING TO FOREST VALUE.

Forestation in China made noteworthy progress in 1920 through the activities chiefly of the provincial governments.

More than 130,000,000 shoots were planted and cultivated by twenty-one afforestation institutions in central and north China at a cost of $250,000 in Chinese currency.

The government railway, anticipating their need of timber, have also taken steps to plant trees along their rights of way. One alone, the Kansu-Haichow Railway, is in process of planting 4,000,000 trees, according to the bureau of economic information.

Afforestation has been extended to nearly all the provinces, with especially promising stations in Shantung and Kiangsu. In the latter province, at Nanking, there are approximately 6,000 acres devoted to the cultivation of 25,000,000 trees. In this station students are given a three years' course in forestation and later are sent to various districts to specialize.

There are three gardens in Shantung which occupy some 700 acres. The largest and most prosperous station is in the north of Kiangsu, near Yengchow, where 3,000 to 4,000 trees are grown every year.

Special afforestation schools have been established in Anhwei, Chekiang, Hupeh, Szechaun and Shansi. It is estimated that 25 per cent of the 1,800 hsiens or counties in China are now engaged in this work, which the Chinese hope will in due course transform many of their barren tracts into flourishing forests.

The establishment of a national arbor day, when all classes of the population are encouraged to plant trees, is pointed to by the bureau as an indication of China's awakening to the value of forestation.—Fourth Estate.

British Trade News

(From our London Correspondent.)

London, 16th August 1921.—The safeguarding of Key Industries Bill has become an Act of Parliament, despite all the opposition put up against it, and a small deputation representing the papermakers was received on behalf of the Imperial Government to urge on the necessity of protecting paper manufacturing interests. The passage of the Bill through the House of Commons was painfully prolonged and it will be up to the Board of Trade to decide on the question of paper being a key industry. Speaking at Glasgow to a meeting of 500 business men, Mr. E. J. Donaldson, one of the few paper men opposing the Bill, said that for five years of the war and two of peace we had been cuddled, sequestered, controlled, and bureaucratted until we could not call our souls our own. British industry, he added, had been built up by British initiative, enterprise and genius in competitions with the whole world and the sooner we got back to those conditions the better. Quite so! But all the papermakers ask is protection against countries with depreciated currencies who are not competing reasonably.

Magic in Cardboard.

Every week in London cardboard is being introduced in some new device. There is as a consequence a growing demand for cardboard which should not be lost sight of in Canada. This week the new device is the office desk luncheon — in a magic luncheon cardboard box. Supposing you are in London doing business all you have to do is to send out of your office for a half-dollar luncheon box containing 3 courses, fish, meat with vegetables, and dessert. Each articles of food is made up in cardboard containers, even to the salt, and there is a serviette made of rice paper, a knife and fork carved out of bamboo and a drinking vessel produced from papier-mache. Considering the thousands in London alone who will create a demand for these boxes of food it may be safely assumed that the demand on cardboard rice paper and papier mache will be enormous as time passes and I understand the railway companies are also encouraging their use. Lyons, the big London caterers, who pay 40 odd per cent. dividend every year, have started the boxes which are made for them on contract.

July Exports of Paper.

The temporary closing of the markets in India and the other Dominions is reflected in the exports of British paper for July. Shipments of all kinds, including cardboard, playing cards, etc., reached 94,616 cwts as against 211,628 cwts in July 1920, the total for seven months January-July being 847,223 cwts. compared with 1,180,308 cwts. for the corresponding period in 1920. Of course, the coal strike had also a good deal to do with a reduction in the exports, but the fact remains that the demand for British paper abroad is at present at the lowest ebb and a quick turning of the industrial tide is necessary to improve the unsatisfactory position prevailing.

Printing paper was exported to the following countries: — To France, 376 cwts. (12,923 cwts. in July 1920); U. S. A., 1,047 cwts. (515 cwts.); other foreign countries, 7,412 cwts (30,366 cwts.); South Africa, 6,624 cwts. (8,218 cwts.); India 6,226 cwts. (25,636 cwts.), Straits Settlements, 331 cwts. (947 cwts.), Ceylon, 453 cwts (1,306 cwts.), Australia, 13,423 cwts (5,640 cwts.); New Zealand, 6,540 cwts (3,237 cwts); Canada, 25 cwts. (27 cwts.); Other Possessions, 2,898 cwts. (6,733 cwts) —making a total of 45,584 cwts. compared with 95,548 cwts. for July 1920. The seven months exports of printings reached 446,549 cwts. compared with 469,761 cwts. for the corresponding months in 1920.

Writing paper was exported in July to the extent of 10,567 cwts, as against 20,543 cwts. in July 1920, the seven months total reaching 78,756 cwts. as against 115,-233 cwts. in 1920. The countries exported to were as follows: to France, 28 cwts. (3,103 cwts. in July 1920); U. S. A., 142 cwts. (55 cwts); Other Foreign countries, 1,756 cwts. (3,805 cwts); South Africa, 256 cwts. (725 cwts.); India, 4,470 cwts. (5,318 cwts); Straits Settlements, 124 cwts. (437 cwts.); Ceylon, 30 cwts. (457 cwts); Australia, 2,014 cwts (2,954 cwts.); New Zealand, 1,238 cwts. (1,569) cwts); Canada 41 cwts. (93 cwts); Other Possessions 468 cwts (2,027 cwts). A great falling-off is noticeable in the shipments to India, Canada, and France. The seven months supply of writing paper to Canada is larger than in 1920 the figures being 713 cwts. as against 169 cwts.

Wood Pulp Imports.

The supplies of wood pulp received in the United Kingdom during July show a material drop — only 55,971 tons arriving compared with 115,804 tons in 1920 and or the seven months, January-July 234,563 tons as against 621,029 tons in 1920.

The supplies were as follows: Bleached chemical (dry) 1,735 tons (1,660 tons in July 1920); Unbleached Chemical (Dry) 19,219 tons (48,155 tons); Chemical wet 156 tons (3,154 tons); Groundwood (Dry) nil (3,488 tons); Groundwood (moist) 34,861 tons, (59,347 tons).

Groundwood (wet) was imported in July as follows: From Canada, 22,314 tons (15,725 tons in July 1920); Sweden 1,000 tons, (20,695 tons); Norway, 11,234 tons (21,794 tons); Other countries, 313 tons (1,133 tons). Total for seven months 146,083 tons (as against 277,212 tons in 192). Total of Groundwood (dry) for seven months 1,227 tons as against 19,882 tons in 1920.

Bleached Chemical (Dry)—From Finland, nil; Sweden 585 tons (669 tons in July 1920); Norway 1,145 tons (810 tons); Germany nil (15 tons); Other countries 5 tons (166 tons) Total for 7 months 7,768 tons as against 18,334 tons in 1920.

Unbleached Chemical (Dry)—From Finland 50 tons (none in July 1920); Sweden, 13,607 tons (27,801 tons); Norway 2,743 tons (8,275 tons); Germany nil (2,613 tons); Canada and other countries, 2,819 tons (3,060 tons). Total for seven months 78,415 tons as against 300,914 tons.

The total value of all supplies of pulp is only £5,681,-092 for the seven months as against £15,703,857 in 1920.

Imports of Paper.

The total supplies of paper, cardboard, strawboard, etc., in July reached 522,724 cwts. compared with 1,424,-768 cwts in July 1920. The seven months figures are 3,249,20 cwts as against 8,377,922 cwts. in 1920.

Printing paper was imported in July as follows: From Sweden 62,574 cwts (38,538 cwts. in July 1920); Norway 31,808 cwts. (67,803 cwts); Germany, 45 cwts (17,-288 cwts); Belgium, 4,136 cwts (4,072 cwts); U. S. A. 250 cwts. (8,778 cwts); Canada, 10 cwts (23,310 cwts); Newfoundland 80,240 cwts. (164,780 cwts); Other countries 49,114 cwts. (99,526 cwts).

Packing and Wrapping Papers: From Finland, 7,152 cwts (48,518 cwts.); Sweden 55,826 cwts (164,863 cwts); Norway, 36,587 cwts (88,325 cwts); Germany, 3,336 cwts (31,102 cwts); Belgium 6,027 cwts (9,030 cwts); Canada, 180 cwts (5,426 cwts); Other countries 13,733 cwts (28,723 cwts).

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. Madagascar Wood and Plants Suitable for Papermaking C. C. GROUD, **Papier,** xxvi (April 1921). Brief description of the woods and grasses growing in Madagascar, with special reference to their utilization for the manufacture of paper pulp.—A. P. C.

A-3. Suitability of Mulberry and Certain Malvaceae for the Preparation of Paper Pulp. J. ST. CLAIR, **Papier,** xxiv (April, 1921).—Japanese mulberry can yield 5 per cent of high grade fibers and 30 to 35 percent of fibers of indifferent quality, but its use for this purpose is not worth consideration. Textile tow from *"Da"* (*Hibiscus cannabinus*) contains 55 to 60 percent of cellulosic, fibers suitable for papermaking, and the stalk can yield 36 to 38 percent of paper pulp of lower quality. Hand sheets made from *"Da"* pulp are very white, slightly glossy, soft to the touch, and rather porous. The tensile, tearing, and folding strengths are very satisfactory. The stalks of *altea rosea,* harvested after blossoming, yield 12 to 15 percent of a creamy white, supple, brilliant, and long-fibered pulp which can be used as a filler.—A. P. C.

A-3. Bourdie Grass.—World's Paper Trade Review, lxxv, 18.—Experimental trials with a raw material known as bourdie grass growing in Egypt and carried on at the Imperial Institute showed a pulp of moderate quality only but suitable for the production of brown wrapping paper or cardboard. It has not been found possible so far to bleach the pulp satisfactorily, and it seems unlikely that the pulp could be used for the production of white paper.—A. C.

A-0 Industrial Preparation and Filtration of Colloidal Masses.—J. H. Frydlender, **Rev. Prod. Chim.,** xxiv, 173-82 (March 31, 1921).—Description of Plauson and Block's "colloid mill" and of its application to many industries, including the purification of resins for papermaking and other uses, and the preparation of plastics, artificial silk, cellulose esters, etc. A special mill has been devised by Plauson and Block and is being marketed by Emil Passburg of Berlin, Germany, for the preparation of matter in a colloidal state. In it the material is ground in the presence of water or other suitable liquid, in such proportions as to have a fluid mass. The grinding element must have a peripheral speed of not less than 2,000 meters a minute, and preferably of about 1,000 meters a second. (Cf. A new large scale commercial method of preparing colloidal dispersions and its future prospects for the chemical industry. Hermann Plauson. *Chem. Ztg.,* xliv, 553-5, 565-7 (1920); *Chem. Abs.,* xiv, 3129 (Oct. 20, 1920). It is claimed that the application of the method to the preparation of colloidal resins yields a very finely divided and high grade product at a low cost, and it is necessary to use only about 1 to 2 percent of solvent. Cellulose or cellulosic materials when passed through the "colloid mill" are transformed into colloidal gels or sols, which may be used for the manufacture of plastics, of artificial silk, or of cellulose esters, or which may be saccharified. The main characteristics of Plauson's ultrafilter are that it works under very high pressure, which may reach 200 atmospheres (about 3,000 lb. per sq. in.), and that its operation is continuous. The filtering surface is supported by means of a perforated metal cylinder which is surrounded by a series of metal gauzes of rather fine mesh. The effective mesh can be varied by suitably adjusting the pressure on the gauzes. As this is not yet sufficiently fine for filtering slimes or colloidal solutions, the pores must first be obstructed by means of a water suspension of the material to be filtered, or of asbestos, plaster, etc. inside the cylindrical space in which the mass to be filtered is introduced, there is a rotating helical screw scraper of such diameter that the thickness of the deposit on the filter may be maintained constant at any desired thickness. The deposit becomes heavier as it descends through the apparatus and may be discharged at the desired consistence. The liquid passes through the filtering medium (composed of the wire gauzes and the deposits) at a constant speed, since the thickness of the deposit, which constitutes the greatest obstacle to its passage, is also constant. The filter may also be constructed by winding several layers of wire around a perforated cylinder. The liquid is forced to flow around a perforated cylinder. The liquid is forced to flow around the interstices between the wires, and these soon become clogged with the material to be filtered, which then acts as a filtering medium. By using a wire covered with cotton, asbestos, cellulose, or paper, exceptionally active filters are obtained. The filters can also be impregnated with rubber, cellulose esters, etc. The filter can be put to numerous industrial uses.—A. P. C.

A-0. Volumetric Determination of Aluminum. ALFRED TINGLE, **J. Ind. & Eng. Chem.,** xiii, 420-2 (May, 1921). In valuing aluminum sulphate for use in papermaking, the ordinary gravimetric estimation of "total alumina" is useless, since "combined alumina," i.e., alumina which goes to the formation of neutral $Al_2(SO_4)_3$, is alone of importance in sizing while the salt as sold commonly contains 1 percent or more of uncombined alumina, which dissolves in the aluminum sulphate solution but takes no part in the reactions involved. Several volumetric methods for the determination of "combined alumina," all of which turn on the titration of the aluminum salt with an alkali, using phenolphthalein as indicator, are compared. The details of manipulation to be observed in carrying out this principle are all-important and constitute the differences between the methods. Of the methods examined, only two were found to be both convenient and trustworthy: Method A: The aluminum sulphate solution is boiled, phenolphthalein solution added, and the still boiling solution titrated with sodium hydroxide solution (not stronger than half normal). The end-point is reached when the pink color persists after boiling for 1 min. (For details consult original. Scott, **J. Ind. & Eng. Chem.** vii, 1059 (1915).) Method B: The solution of aluminum sulphate should contain approximately 10 Gm. of the salt per liter. To 100 Cc. while boiling, add 5 Cc. of saturated barium chloride, drop by drop, followed by 4 or 5 drops f 0.1 percent phenolphthalein solution. While still almost boiling the solution is titrated with standard sodium hydroxide of convenient strength. The mixed precipitates settle rapidly and the end-point is very delicately shown

by the pink color of the supernatant liquid, best viewed horizontally. If the maximum accuracy is not demanded, a very slight excess of alkali may be used, producing a coloration which can easily be seen without waiting the short time necessary for the precipitate to settle. Method B has some slight advantage over A, especially in the presence of iron. It is quite essential to use an alkali of titer not more than half normal.—A.P.-C.

C-8 Measuring Moisture Content of Chips.—F. M. WILLIAMS, **Paper,** xxviii, 7 (April 20, 1921); **Paper Trade Journal,** lxxii, 16; **Paper Mill** xliv, 16.—Brief discussion of the importance of testing chips for moisture, and of the merits of the Williams standard pulp testing outfit for this purpose.—A. P. C.

E-2. Waste Sulphite Liquor for Tanning.—WALTHER BRUCKHAUS, **Chem. Techn. Ind.,** 1920, 3, 1; **Chem. Zentr.,** 1920, xi, 11, 469; **Rev. Prod. Chim.,** xxiv, 225 (April 30, 1921).—Waste sulphite liquor possesses no tanning power. The iron, lime and sulphurous acid which it contains exert a noxious action on tanning materials. Purified liquors, however, may be useful in tanning, as they favor the penetration of the tanning materials into the leather.—A. P. C.

E-5. Shortening Cooking Time of Sulphite Pulp by Preliminary Impregnation.—Vance P. Edwardes, **Paper,** xxviii, 7; **Paper Trade Journal,** lxxii, 16; **Paper Mill**, xliv. 16. **Pulp and Paper xix, 36.**—Detailed description of experiments carried out on a semi-commercial scale. The tests showed that woods can be pulped successfully in appreciably shorter time and at lower temperatures by the use of preliminary impregnation. When using this modified method of pulping it is necessary to change the acid composition to take care of the increased speed of the chemical reaction. The purpose of the lime in sulphite acid is to remove from the sphere of action the decomposition products formed by the reaction of the sulphite acid and the lignin complexes. Evidently, when these complexes are formed more rapidly than usual it is necessary to have higher concentrations of lime in the solution. Increased yields, decreased screenings, and stronger pulp also accompany the use of higher combined. It remains for a mill-scale trial to prove the feasibility of the idea.—A. P. C.

G-9; K-12. Theory of Atmospheric Evaporation. W. H. CARRIER, **J. Ind. & Eng. Chem.,** xii, 432-8 (May, 1921). A mathematical development of the subject, proving the following points: The rate of evaporation at any instant per unit of surface is proportional to the difference in vapor pressure between the liquid and th vapor of that liquid in the immediate vicinity. Other conditions beng constant, the rate of evaporaton increases in direct proportion to the velocity. (Cf. W. H. Carrier, **Proc. Am. Soc. Heat. Vent. Eng.,** xxiv (1918); Thomas Box, **A Treatise on Heat,** 1870). The rate of evaporation is substantially proportional to the wet bulb depression, when the material is not heated, and 95° depression is approximately equivalent to 1 in. difference in vapor pressure in the evaporation formula. The drop in temperature of the air in the drier is proportional to the rise in vapor pressure of the air. The weight of evaporation is substantially the same at any temperature per degree depression. The capacity of air for producing evaporation is directly proportional to its wet bulb depression. For a given exposed surface and air quantity, the ratio of the final depression to the initial depression is constant regardless of changes in dry bulb temperature or moisture content of the air.—A.P.-C.

G-9; K-12. Rate of Drying Solid Material. W. K. LEWIS, **J. Ind. & Eng. Chem.,** xiii, 427-32 (May, 1921). A discussion of the fundamental factors affecting the drying rate, with the derivation of drying formulas, their applications to special cases, and also their general significance. It is shown that the drying of a solid material represents a balance between the process of diffusion of moisture through the substance and of evaporation from its surface; and that these processes can be quantitatively represented by a differential equation which can, after modifications dependent on the material being dried, be integrated into simple and usable formulas which answer the question as to drying rate.—A.P.-C.

G-9; K-12. Tunnell Driers. GRAHAME B. RIDLEY, **J. Ind. & Eng. Chem.,** xiii, 453-60 (May, 1921). Tunnell driers may be built suitable for drying any material which can be handled economically on trays. Materials that will stand a higher temperature when wet than when dry can generally be dried most rapidly when they enter the tunnel at the hot end, as the temperature of the cold end then becomes the limiting temperature, and a higher average temperature may be maintained. The highest thermal efficiencies are obtained when the air is discharged at the highest relative humidity that the condition of the product will permit. It is usually more economical to use a large quantity of air at high velocity with recirculation, than to use a small quantity of air with low velocity and no recirculation.—A.P.-C.

G-9; K-12. Compartment Driers. W. H. CARRIER and A. E. STACEY, Jr., **J. Ind. & Eng. Chem.,** xiii, 438-47 (May, 1921). An outline of the field of the compartment drier, its advantages and limitation, of the methods of heating and of moisture removal, of the classification of compartment driers, and of the various types of compartment driers.—A.P.-C.

G-9; K-12 Spray Process of Drying. R. S. FLEMING, **J. Ind. & Eng. Chem.,** xiii, 447-9 (May, 1921). Outline of the apparatus required, nature of the process, advantages of preconcentration, recovery of product, temperature of drying, and application of the process.—A.P.-C.

G-9; K-12. Direct Heat Rotary Drying Apparatus. ROBERT G. MERZ, **J. Ind. & Eng. Chem.,** xiii, 449-52 (May, 1921). Description of the various types of direct heat rotary driers, of their general mechanism, applications, advantages and disadvantages, with a brief discussion of their efficiency and of the advisability of utilizing waste heat from another processes to heat them.—A.P.-C.

K-12. Paper Machine Building in Canada.—Pulp and Paper, xix, 462,466 (April 23, 1921).—Description of the more novel features embodied in the design and construction of the two fast newsprint machines completed by the Dominion Engineering Works for the Laurentide Company at Grand'Mere.—A. P. C.

K-12. Book Paper Machine. World's Paper Trade Review, lxxv, 18.—Details of a book paper machine installed by the Pusey & Jones Company for the Kimberly Clark Company.—A. C.

K-23. Old English Papermaking Revived.—World's Paper Trade Review, lxxv, 18.—A description of the process used by the American Writing Paper Company to secure a reproduction of the distinctive deckle edged paper used in the time of Queen Elizabeth.—A. C.

N-4. Electric Boilers.—World's Paper Trade Review, lxxv, 18.—An article dealing with the installa-

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PULP AND PAPER NEWS

The Toronto printers' strike still continues, to the great detriment of nearly every branch of the paper industry. In a way, there is some sense in a remark made to the writer, the other day, to the effect that time is on the side of the employers. For, were the strike to continue indefinitely, the latter would, in time, get all the trained labor they require, for their "open shops", even if they had to take unskilled labor and get it trained for themselves, as they are in process of doing today. The pupils who are coming forward to join the school of printers, organized in view of such exigencies, are, it is stated, of a very superior type — University graduates and others. They are attracted by what are considered high wages, combined with work that is not ultra-laborious, and there is no doubt that the employers contention that a superior education to that possessed by the average working printer would be highly advantageous in operation in the composing room has a certain weight with many of the public who have printing work to be done.

However, the striking printers are very far from being in the mood to let the employers have things all their own way. They are criticizing the work which is turned out by the "open shops", claiming that much of this work is far below the proper standard, owing to the alleged fact that non Union shops are unable to secure efficient men. In this connection, they lately published in the papers rather on effective educational in the form of a piece of work turned out by a non-Union shop with the errors all clearly noted after the fashion of a corrected proof.

Further, a publicity campaign is being inaugurated throughout the Province by the Toronto Typographical Union for the purpose of setting forth the Union's views in regard to the strike situation. A staff of men, comprising superintendents and foremen who have been called out from the various shops which refuse to concede the forty-four hour week, has been busy lately at preparing literature to be mailed to every printing establishment in Ontario. The Union officials state that the Toronto Labor Temple, addressing envelopes and there are eighty-two shops in Toronto which have already signed the forty-four hour week agreement. At a recent meeting when the men received their strike pay it was announced that the question of the printing required for the York Township Council had been taken up, and the statement was made that the authorities had decided to ask for tenders from the forty-four hour shops. A committee is also to be nominated to wait upon the Board of Control, to protest against the admission into the city of out-of-town printers on the ground that they are likely to swell the ranks of the unemployed. It is claimed that men are coming to Toronto from country points in consequence of the strike.

The report of the International Typographical Union shows that its total membership is now 75,000. Of this number, 15,000 are not working at their trade, but are still members of the Union. The report states that 40,000 members are working in the book and job industry, and that 33,000 members are signed up and working on a forty-four hour week — a fact which is adduced as proof that the forty-four hour week principle has won. There are 8,000 members still on strike in Canada and the United States. The recent convention decided to continue the strike indefinitely — an attitude which is presumably rendered possible by the surplus of receipts over expenditures, which is stated to have been $70,000 for the month of July, and to be liable to be increased every month by reason of the withdrawal of assistance from other printing industries.

Considerable interest was evinced in paper circles in the slumping of International Paper Common on Wednesday of last week to 38½—a new low record for the current year — by reason of the fact that the decline was attributed to rumors that the company may announce another reduction of $15 a ton in the price of newsprint, within the very near future. Rumors — and rumors of rumors — are very rife with respect to newsprint price. A few weeks ago, rumors in this county were to the effect that some producing concerns here had reduced their prices considerably, and it seems that Wall Street deems it likely that the International would reduce its prices to meet this competition — if it exists.

Messrs. T. S. Wellings and Co., of Englehart, Ont., are erecting a new rossing plant at Connaught in Northern Ontario, and good progress is being made with construction.

The Toronto Globe, last week, printed a letter, dated from London, Ont., and signed "A Preferred Shareholder", suggesting that an investigation into the Riordon affairs should be made "either by the Government or someone whom the public feel they can trust." The letter continues: "The stockholders feel there should have been a general meeting of the shareholders called, whereby they would have an opportunity to ask any questions they desire, also to appoint a competent committee to watch their interest in the meetings taking place daily in connection with the proposed reorganization."

At a meeting, last week, of the directors of the Howard Smith Paper Mills, Ltd., Mr. J. Anderson, head of the firm of J. Anderson and Co., Inc., New York, was elected a director. It was stated at the meeting that the new pulp mills at Cornwall were now running to about 75 per cent. capacity.

The heavy cost of publishing is given as the reason for the discontinuance of the Chatsworth News, of Chatsworth, near Owen Sound, Ont. The paper, which was established some 36 years ago by the late Mr. George Blyth, is now incorporated with the Owen Sound Sun-Times.

The statement is made that Mr. G. R. Hall Caine, a business associate of Mr. F. E. R. Becker, of the Becker Paper Mills, of England, will shortly visit Canada in connection with reorganization plans which will affect the North American Paper Company's trust. The Company is understood to have been working on a plan whereby the holders of the trust stock would receive Saguenay Pulp and Power stock, or cash in exchange for trust stock, according as they might choose. Nothing has been heard lately of the completion of this plan. Some months ago, it may be remembered, the Becker Mills, which are represented by Mr. Hall Caine, were reported to be largely interested in the Canadian under-

taking, and, in any event these mills are large consumers of the groundwood pulp manufactured at Chicoutimi.

According to a despatch from Chatham, Ont., Mr. Arthur Stringer, the well-known writer of fiction, has received authority to organize a Western Ontario section of the Authors' Association of Canada, and it is probable that steps will be taken shortly towards organization. The territory embraced by the Western Ontario section, with headquarters in Chatham, will, for the present, extend some distance east of London.

Lord Northcliffe has just added another 300 acres of pulpwood lands to his vast holdings in Newfoundland. The proprietor of many periodicals and newspapers, who owns a big paper mill at Grand Falls, has just given $50,000 for his purchase of 300 acres in the Conception Bay district.

After playing brilliant golf on the first day, Marcus Greer of the Laurentide Co. had a slump and was defeated in the championship tournament at Winnipeg last week.

The live wires of the Brompton mill at East Angus are planning a fine program of sport and entertainment for Labor Day.

The firm of Krupp, the birthplace of German munitions, is now making paper mill machinery. A unique machine is a tandem sheet calender, each stack having 10 rolls, with bands to carry the paper through.

Mr. Eagle of the Chicago Daily News and Mr. T. E. Pope of the Canadian Export Paper Co. were visitors at East Angus recently. They motored to Doucett's Landing and crossed in a launch to Three Rivers to visit the St. Maurice Paper Co.

Mr. Henning Helin, consulting expert on pulp manufacture is in Europe and expects to return to Vancouver in about two months.

The Allen Electrolytic Cell Co. of Portland, Me. have sent an engineer to Haiphong, French Indo China to start up a chlorine plant of 84 Allen Moore cells in connection with the pulp and paper mill operated there by the French.

WAGES MORE THAN DOUBLED.

In a recent address, Mr. R. S. Kellogg, secretary of the News Print Service Bureau said: "In 1914 the yearly wage of an employe in the paper mills made an average of $676, while in 1920, the year in which the price of this year's paper was fixed, this average was $1,486. On the other hand, the production of each employe in 1914 was eighty tons, but under the higher wage in 1920 this production was cut down to sixty-eight tons.

The pay roll labor costs per ton of paper in 1914 amounted to $8.48, while the cost per ton in 1920 was $21.87. A cord of wood used in making paper in 1914 cost the mills only $12.98, while this cost was boosted to $29.16 in 1920.

The depletion of raw materials for making paper is serious, but does not, constitute a crisis, Mr. Kellogg declared. The solution of the problem lies in reforesting.

NEWSPRINT PRICE CUT BY M. & O.

The Minnesota and Ontario Paper Company announced a price of $88 per ton for newsprint paper for the months of October, November and December. This is a further voluntary reduction of $10 per ton from the contract price, and is in addition to a reduction already given of $5, making a total reduction of $15 per ton from the price previously fixed by contract for the last quarter of 1921.

PICHE DESCRIBES AIMS OF FORESTRY.

Canada's timber resources are fast becoming exhausted. J. G. Piche, chief forest engineer of the province of Quebec, declared in an address to the Rotary Club at Quebec. He emphasized the necessity for all citizens, as well as for the Government, to take steps to safeguard the forest in every possible way.

"Forestry is an art born of necessity", said Mr. Piche, "and we, like most other countries, are only beginning to realize the necessity for conserving our forests now when their resources are fast becoming exhausted. The aims of forestry are, first to render productive all lands which are unfit for the cultivation of other crops, and for this reason the department insists on the proper classification of soils. We also wish to reforest as soon as possible three million acres of waste land. The Government has opened a nursery at Berthierville, and begun demonstration plantations at Lachute and elsewhere and it is expected that private initiative will follow suit.

"The second aim of forestry is to produce as much timber as possible per acre, and this implies the employment of adequate treatment in each type of forest and the carrying out of necessary improvements, such as thinning, planting, etc.

"The third is to make lumbering conservative by removing all timber in each tree, small tops, low stumps, and the use of inferior species for the building of camps, roads and bridges will accomplish this end.

"The fourth is to study properly the subject in order to know the requirements, and the last, and one of the most important aims of forestry, is to protect the woods so as to insure the safety of the headwaters of streams, shifting sands, etc., and the protection of forests against fires, which cause such great losses every year. It is of vital importance that forests should be fireproof.

"The educational campaign must be conducted by everyone in every locality, and Rotarians should assist in this work. They could do so if every Rotarian were to become a member of the Canadian Forestry Association."

POSSIBILITY OF LUMBER SHORTAGE.

That curtailed production is likely to result in a shortage of lumber next year is the prediction of a Three Rivers lumber dealer, who states that the number of men being sent into the woods this year will be considerably reduced. Demand for nearly all lines of lumber is slow and as manufacturers and wholesalers are unable to dispose of what stocks they have on hand they do not feel justified in adding to their holdings more than appears perfectly safe under present conditions.

Pulpwood.

We understand that the local paper mills will do very little cutting this winter and some of them in this section will not cut at all. Those firms sending men into the woods will employ them at much lower wages than were paid last year. Our Shawinigan correspondent informs us that the Belgo and the Laurentide will not cut this year and that large supplies of food on hand owned by the companies may be purchased by Shawinigan for the poor and unemployed.—St. Maurice Valley Chronicle.

DEATH TAKES J. S. CROWELL.

J. S. Crowell, former owner of the Crowell Publishing Company, Springfield, Ohio, publisher of the Woman's Home Companion, American Magazine and Farm and Fireside, died Aug. 17 in Cincinnati. He had been ill with cancer for many months.

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tion of electric boilers in the paper mill and the advantages therefrom. (See *Pulp and Paper*, Aug. 4, 1921.)—A. C.

N-7. How to Increase the Efficiency of Waterpower Plants. CHARLES M. ALLEN, **Paper,** xxviii, 7 (April 20, 1921); **Paper Trade Journal,** lxxii, 16; **Paper Mill,** xliv, 16. Description of the Alden dynamometer (See **Transactions, A.S.M.E.,** xxxii, p. 275) and the method of using it, followed by a discussion of the following points on the efficiency of waterpower plants; gate opening, wheel settings, inspection and cleaning of wheels, keeping trash racks free, obstructions in the draft tube and tail race, proper speed for maximum efficiency. A.P.-C.

R-2. Bibliography of Papermaking.—Clarence Jay West, chairman, Committee of Bibliography of the T. A. P. P. I.—**Paper,** xxviii, 7 (April 20, 1921).—Comprehensive bibliography of books and articles published in 1920.—A. P. C.

R-5. Newfoundland's Pulp and Paper Industry. Pulp and Paper, xix (May 12, 1921). Brief outline of the present status of the industry in Newfoundland.—A. P.-C.

R-5. Paper Industry of Austria, Hungary and Czechosiovakia.—Paper, xxviii, 7.—Brief sketch of the present status of the industry in those countries.—A. P. C.

R-5. Statistical Summary for 1920.—**Paper**, xxviii, 7 (April 20, 1921).—Summary of the production, shipments, and stocks on hand for each month of 1919 and 1920 of United States Paper mills, classified according to grade of paper manufactured; and of stocks on hand at the beginning and end of year, total quantity produced and shipped during the year, by grades, for 1917-1920 inclusive and also production, shipments, and stocks on hand of pulp mills (classified according to grade) for all pulp mills.—A. P. C.

R-7. Prevention of Industrial Troubles.. WARFIELD WEBB, **Paper,** xxviii, 6 (April 13, 1921. The danger of strikes can be minimized and labor disputes obviated if the employers will prove to their employees that they are human as well as the latter and have a right to be heard. It is simply putting the golden rule into practice and while still retaining their authority showing they are willing and eager to treat their employees fairly.—A. P.-C.

R-7. Job Analysis and the Employee. WILLIAM O. LICHTNER, **Paper,** xxviii, 4 (March 30, 1921). A systematic job analysis is necessary for the purpose of: (1) standardization of jobs; (2) correlation of jobs; (3) determining the job's relation to routine work through office or factory; (4) determining its relation to salary policy; (5) determining its relation to employment; (6) adapting machines or equipment to individuals when possible. Job analysis brings out the necessity of establishing a competent training staff which will take each new workman and intellegently instruct and work with him until he can accomplish both the quantity and quality set by the standard. It benefits the employee in many direct ways, such as determining the standard of work expected of him; simplifying his work and making it easier to master; making him fit more easily into the general scheme of the organization — to become an integral part of it; increasing his wages ,etc.—A. P.-C.

R-11. Forest Products Laboratories of Canada. A. R. R. JONES, **Pulp and Paper,** xix, 535-6 (May 19, 1921). Outline of the scope of the work of the Forest Products Laboratories of Canada and of their importance to the wood using industries of Canada.—A. P.-C.

R-12.Why We Have a Cost System. S. B. COPELAND, **Paper,** xxviii, 6 (April 13, 1921). At the Eastenr Manufacturing Company, the following reports are compiled by the cost department: period statement of income, assets and liabilities; estimated cost of paper, and sales reports; control of manufacture; control of inventories and purchase of materials; control of cost of repairs and new construction. These have been found essential in determining the sales policy and making decisions on manufacturing problems. The expense of obtaining this information in comparison with the losses that could readily occur because of not having this information, is considered to be negligible. See also Pulp and Paper, Aug. 11, 1921.—A. P.-C.

R-12. Cost Association of the Paper Industry.—Paper, xxviii, 7; **Paper Trade Journal,** lxxii, 16; **Paper Mill,** xliv, 16.—Account of the meeting held in New York April 13, 1921, including the following papers: "Some Practical Aspects of Installing Cost Systems," C. Oliver Wellington; "Importance of Costs and their Relation to Manufacturing and Banking," Ellery A. Baker: "The Budget System," Durward Earle Burchell; "Preparation of Cost Figures for Administration Control", Harold Dudley Greeley.—A. P. C.

R-12. Prices of Raw Materials for Papermaking.—Paper, xxviii, 7 (April 20, 1921. Graphic charts showing average weekly prices for the last ten years of: domestic bleached soda pulp, domestic unbleached sulphite, foreign unbleached sulphite, domestic bleached sulphite, foreign bleached sulphite, repacked thirds and blues (domestic), new shirt cuttings (domestic), No. 1 hard white shavings, No. 1 roofing rags (domestic), groundwood, No. 1 whites (repacked domestic rags).—A. P. C.

R-12. Standardization in Paper Mill Cost Systems. T. J. BURKE, **Paper,** xxviii, 6 (April 13, 1921). Text of Secretary Burke's address at the meeting of the Wisconsin Division of the Cost Association of the Paper Industry, March 24, 1921, at Nenah, Wis.—A. P.-C.

R-13. Technical Section of the Paper Makers' Association of Great Britain and Ireland. Paper Maker and British Trade Journal, lxi, 2. An account of the meetings at Manchester and Aberdeen, including a paper by T. D. Nuttall on "Development from an Engineering Point of View" and a criticism of W. Adamson's Paper on "The Utilization of Heat and Power in Paper Mills."—A.C.

R-13. British Paper Makers' Association. World's Paper Trade Review, lxxv, 16. Important subjects affecting the industry, which were discussed at the annual general meeting.—A.C.

R-13. Technical Association of the Pulp and Paper Industry's Annual Meeting. Paper, xxviii, 7 (April 20, 1921); **Paper Trade Journal,** lxxii, 16; **Paper Mill,** xliv, 16. Account of the meeting held in New York, April 12, 1921, including reports of the secretary, the executive committee, committee on bibliography, abstract committee, committee on vocational education, committee on coated and processed papers, soda pulp committee, sulphate pulp committee, and papers presented.—A. P.-C.

R-13. National Paper Trade Association's Meeting.—Paper, xxviii, 7; **Paper Trade Journal,** lxxii, 16; **Paper Mill,** xliv, 16.—Account of the meeting held in New York, April 13, 1921, including address of retiring president Ross P. Andrews, and Secretary Ridgway's annual report.—A. P. C.

UNITED STATES NOTES

Charles Lathrop Pack, president of the American Forestry Association, has sent out a letter to the governors of several States suggesting the appointment of representatives to attend the discussions at a forestry conference to be held this week at Woodstock, N. H. Mr. Pack wants all of the Northeastern States to be officially represented at the conference. "This annual New Hampshire conference is one of the most important of the year," Mr. Pack wrote in his letters to the governors. "The big manufacturing plants of New England and the other eastern States are absolutely dependent upon forest products to keep going. Connecticut spends $3,000,000 a year in freight rates on forests products which she should be producing almost at her factory doors. There are 81,000,000 acres of idle land in the East and Middle West that should be growing trees. Three-fifths of our original timber is gone and half of what is left is West of the Rocky mountains. That means big freight bills for Eastern users. Some of the speakers at the conference will be Gifford Pinchot, forest commissioner of Pennsylvania; Prof. J. W. Toumey of the Yale forest school, S. B. Detwiler, chief of the United States Blister Rust Control; Dr. H. H. York of the University of West Virginia, and Dr. Eloise Gerry, of the United States Forest Products Laboratory.

On application of Col. Ransom Gillette, representing the International Paper Company, Supreme Court Justice McPhillips has enjoined the Corinth, N.Y. village trustees from voting authorization of a $20,000 bond issue to pay special police employed by the trustees as a result of the International Paper Mills strike there. The injunction is returnable September 10. It orders the trustees to show why between $12,000 and $15,000 has already been expended to pay for special policemen and why the money should not be refunded to the village. Shortly after the company began importing strike breakers into its mills the village officials placed on duty a large number of policemen for special work. These men were mostly strikers, and most of the trustees are strikers also.

E. Vernon Fox, who is widely known to the trade in the Middle West, has resigned as secretary and vice-president of Arthur R. Ray Company, the Chicago paper jobbing house, with which he became identified last January when he severed his connection with the Nekoosa-Edwards Paper Company. Mr. Fox has been actively engaged in the paper trade of the Middle West since 1898, serving several leading establishments. He is not prepared to state at this time what his future connections are to be.

The Mittineague and Woronoco mills of the Strathmore Paper Company are closed due to slack business. The date of reopening, it was announced to the 600 employees who have been laid off, will depend mainly on business conditions. Extensive repair work will be undertaken during the shutdown.

The Newton Falls Co., Watertown, N.Y., has elected for its president Arthur J. Baldwin of the McGraw-Hill Co., New York City, to succeed Frank L. Moore. The latter withdraws from the management of the company, giving up the posts of president and general manager held by him since 1907. Mr. Moore's withdrawal was agreed upon last year when the Watertown concern was taken over by the McGraw-Hill Company and the United Publishing Corporation. He is to continue as a director of the company. Changes have been completed in the mill, adapting it for the production of book paper. Mr. Moore has been prominently identified with the paper industry since 1900 when he established units of the Remington group of mills and brought them to a paying basis. He has been president of the American Pulp and Paper Association for several terms. While he has made no announcement as to his future plans, it is not likely Mr. Moore will remain very long without associating with some enterprise in which he will play an active part.

Federal customs officers at New York and elsewhere have received instruction to watch out for shipments of pulp and paper from abroad and compare prices with a view to preventing violations of the anti-dumping provisions of the emergency tariff law of May 27 last. The New York appraiser, acting under authority of Section 201 of the tariff act, has called upon two importers receiving recent consignments from Scandinavia and Germany to give bond to cover any special anti-dumping duty which may be imposed by the Secretary after investigation. These actions are viewed in some quarters as initial moves in a campaign to curtail, or cut off altogether, importations of foreign pulp and print paper. This would undoubtedly work out to the benefit of American paper manufacturers who have been working for a pulp and paper tariff.

At the Montague, Maine, plant of he International Paper Company, two waste gates in the dam were wrecked by dynamite last week. Company officials declared that the violence was resorted to with the evident object of halting logging operations. A sheriff's posse was sent to the scene of the disturbance, and at last accounts there was no further trouble.

Ellis J. Staley, New York State Conservative Commissioner, has organized a bureau which is to make a study of stream pollution and its prevention. The law authorizes the Commission to investigate the extent and character of the pollution of rivers, lakes, streams, bays, harbors and other waters by sewage, industrial waste and other refuse. Within this province, the new bureau will carry on investigations to be used as a basis for formulating plans for the control of such waste disposal and the establishment of definite standards of pollution. It will endeavor to unite all the interests concerned, and through co-operation with all agencies, both governmental and private, engaged in any phase of the conservation of water, seek a solution of this important problem.

C. A. Jones has resigned from the staff of the American Writing Paper Company and as Chairman of the Committee on Beater Furnish of the Cost Association of the Paper Industry to assist Durward F. Burchell at the school of Industrial Accounting, Harvard University. In order that the work of this important committee may not be held up, Henry W. Miller, also of the American Writing Paper Company, has offered to take the place as Chairman.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 27th August.—General business conditions in the paper trade have not changed much since last writing. But the improvement then noted, in certain lines, has been maintained, and, perhaps, in some instances has increased. Orders are certainly coming along a good deal more freely than was the case a month or two ago, and generally for somewhat larger, and, in not a few cases, considerably larger, consignments. Early in September, according to common expectation, business is likely to take a sharp turn for the better. There have been no appreciable changes in prices, though that of newsprint continues to be the subject of a good deal of speculation and discussion, which are not likely to be lessened by the announcement, reported elsewhere in this issue, that the Minnesota and Ontario Company has announced a price of $88 a ton for the months of October, November and December. In no line, with the possible exception of newsprint, are prices likely to go much lower in the near future. For one thing, they have now touched bottom according to the manufacturers. For another, there is little encouragement to reduce them as it was found that the reductions made hitherto did not stimulate business, — if anything, rather the contrary.

There is little doubt but that the printers' strike has operated very detrimentally on the paper business, in nearly all lines. As regards export business with Great Britain—a business in which kraft, newsprint and boards are the three lines principally concerned—there are encouraging signs of revival in evidence. This business has been slack recently, and still continues too sluggish, because the stocks in Great Britain have not yet been fully liquidated. The demand being small, prices have remained low. But, as soon as ever the liquidation of stocks have proceeded beyond a certain point—and the best information obtainable is to the effect that that point has nearly been reached now—prices will go up.

In connection with the export trade, in some lines, a word of reassurance, as to the quality of the competition from Scandinavian countries, may not be out of place. It is certain that the costs of production in Norway and Sweden today, whatever may have been the case in the past, are now so high that the prices quoted by Scandinavian concerns cannot possibly be based on those production costs. The reason why they are offering both pulp and paper at the prices at which they are, in fact, offering them today in Great Britain is because they are largely over-stocked and the banks are pressing them for payment. Competition of this kind need cause no more than a very temporary disquiet among Canadian concerns doing an export business. For it is obvious that it is a kind of competition which in the very nature of things, cannot endure. If there should be any surprise at what has just been written as to the high production costs in these Scandinavian countries, it may be pointed out that labor, in Norway and Sweden, is now paid after a very different rate from that at which it was paid in the days before the war, and, not only that, but it now works very much shorter hours than it did in those days. Further, the cost of coal and various necessary materials has mounted immensely in those countries. As regards quality, it is certain that, so far as kraft is concerned—and it is kraft which comes, more directly than any other line, into competition with Norway and Sweden, it is certain that Scandinavian countries have nothing superior to the Canadian product to offer.

Turning again to the general domestic situation in the trades, it is advisable that wholesalers should caution their customers anent the risk of allowing stocks to get too low. Already, in certain lines, the orders that are coming in partake too largely of the nature of "rush" orders for immediate delivery. In the case of wrapping papers, for example, there is thus a distinct danger that the Christmas trade may revert, to a certain extent, to the conditions which obtained last year when the mills became so glutted with orders that it was found impractible to give deliveries in time. With the best will in the world, the mills cannot perform impossibilities.

NEWSPRINT. — Many of the mills continue to do a nice business. It is possible that there is a certain holding off from buying in expectation of a reduction in price. But, as soon as this question is settled one way or the other, a noticeable increase in buying will result.

BOOK AND WRITING PAPERS.—The business in book and writing papers and envelopes, etc., continues to improve in a gratifying manner. The mills could do with an increased demand for the higher grades, however.

WRAPPING PAPERS.—A really substantial briskness is being exhibited in wrapping paper. Not merely are orders coming along freely and in greatly increased volume, but they are also coming in without solicitation. This is encouraging in itself, and, further, from the fact that, more than most other branches of the paper trade, the market in wrapping papers affords a barometer of the general business situation in the country. It is significant that many orders are coming in from the West, where, very largely, the optimism of the country seems, at the moment, to be principally residing.

PARCHMENT.—The parchment mills are working to capacity on orders calculated to keep them busy for a nice while ahead.

BOARD.—The board mills are experiencing a revival of business and those in Ontario are working full time.

TOILETS AND TISSUES. — The mills turning out toilets and tissues are satisfactorily busy.

RAGS.—There is some little expansion of activity in domestic rags and roofing stock, and the expectation is that this will be considerably enhanced in two or three weeks' time.

"A whole lot o' de talk dat goes 'round," said Uncle Eben, "ain't no mo' real help in movin' forward dan de squeak in de axle."



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INQUIRIES SOLICITED:

NEW YORK MARKETS.

New York, August 27.—(Special Correspondence). Trading in paper in New York this week has developed few, if any, new market features. Business is still of comparatively limited compass. There is a fairly consistent demand for most kinds of paper, but the aggregate supplies being absorbed by consumers are of lighter volume than in busier times and manufacturers are mostly in want of orders. Information obtained from jobbers in this city indicates that trade activity is slowly but surely increasing. Paper dealers here say that demand from printing houses is gradually growing, that department stores are buying paper in somewhat larger quantity, that paper box manufacturers are absorbing slightly increased amounts of paper and board, and that the movement of supplies in various directions is well on the road to full recovery. Reports in this connection are invariably qualified by those giving them saying that demand is as yet considerably under normal, but much satisfaction is expressed over the more favorable position of the market, and confidence is generally felt that business in paper will undergo appreciable expansion during the next several months.

One of the liveliest branches of the market at present is in tissue papers. Consumers of fine tissue apparently are preparing for the pre-holiday season which is due now within several months and when consumption of fine tissues is at its height, and some orders for sizeable tonnage of white and manila tissue have been placed lately. Mills making this kind of paper are said to be running at very close to capacity, and prices on tissues rule quite firm. No. 1 white, basis 20x30 inches, is bringing 95 cents to $1 per ream f.o.b. New York, while No. 2 white and No. 1 manilla, basis 24x36, are selling at about the same figures. Coarse tissues also are moving well. Demand for napkins and towels is easily as voluminous as it has been at any time during the past year or two, and manufacturers of this class of paper goods are keeping busily engaged. This is a branch of paper industry which will undoubtedly hold its increase in business gained during the war period. Restaurants, hotels, stores and households which substituted paper napkins and towels for linen when the latter rose in price to an almost prohibitive level are likely to continue to use paper, and members of the trade look for a large growth in paper consumption in this direction.

If anything, the book paper market shows a little firmer tone. Prices have not advanced but they appear to be stiffening to an extent, and manufacturers seem set on securing at least 6 cents per pound for machine finished book paper, whereas a large majority are quoting in excess of this figure, between 6.25 and 6.50 cents a pound at delivery points being the range commonly quoted. It is true that several orders involving a fairly large tonnage of machine finished book were taken some few days ago at a basis under 6 cents, one order, it is said, for 5,000 tons being accepted by a mill not far from New York at 5.75 cents f.o.b. this city, but it is understood that these commitments were entered into with the idea of keeping the mills operating at something approaching capacity, and mills in the Middle West are not attempting to compete at any such prices.

Wrapping papers are moving in a routine way at moderately steady quotations. No. 1 domestic kraft is quoted at 5.50 to 6 cents, and No. 2 grade at half a cent per pound less, and while individual orders are said to call for rather small amounts, the total quantity of paper being bought is reported fair for this time of the year. Fine papers are in a quiet condition. With business in various industries slow it naturally follows that consumption of writing papers is not what it ordinarily is, and this is clearly reflected in the volume of orders mills are receiving. Holyoke mills are reported running on an average between 50 and 60 per cent of capacity, but it is understood that a good many orders are now being filled from stock, which would run the percentage of sales up a little higher than mill operations would suggest.

The board trade seems to be a little livelier. Mills are said to have accumulated orders during the time they were closed down a few weeks ago and most of them are now reported running at a fair rate of capacity. Demand is insufficient to cause any enhancement of values, but with old paper costs mounting again, it is likely that manufacturers will be obliged to advance their quotations on board. Prices at present afford scant room for profit, and if raw material goes any higher, manufacturers will either have to market board at a loss to themselves or else mark up prices.

GROUND WOOD.—Mechanical wood pulp is in a firm market position. Demand is fairly heavy, considering the season of the year, and supplies show signs of diminishing as grinding plant after grinding plant is compelled to close down because of low water. There is little doubt that the situation in chemical pulp is having influence on ground wood and is, in some measure, keeping prices on the latter from advancing. Importations of ground wood also are a market factor. The amount of mechanical pulp coming into the States from European sources is not large, it is authoritatively

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St. John, N.B. Canada.

stated, but the fact that importers are selling this pulp at prices under those prevailing on domestic ground wood has its effect on the market. Sentiment in the trade continues bullish, however, and many express the opinion that unless production increases substantially during the next month or two, ground wood values are due to undergo considerable enhancement. Quotations on domestic prime spruce ground wood range from $28 a ton f.o.b. grinding plants upward, with some producers asking as high as $32.

CHEMICAL PULP.—There appears to be a little firmer tone to chemical pulp. This apparently is due to most of the spot stocks of imported pulp having been removed, which keeps owners of such pulp from disposing of supplies at sacrificed prices, since manufacturers in the Scandinavian countries and Germany are becoming firmer in regard to prices on pulp for forward shipment from primary sources. Prices have not advanced, but the slashing procedure seems at an end, and there is more regularity to the quotations named.

Domestic pulps are in an uncertain price position. One of the foremost producers of bleached sulphite in the States is reported to be advising customers that he intends to continue manufacturing until he has ground up present stocks of wood, after which he asserts he will close his plant down until such time as conditions change where he can compete with foreign pulps. This indicates that domestic manufacturers do not propose to make pulp to be marketed at a loss to themselves, and if this policy is generally followed a different complexion is likely to be given the pulp situation.

Arrivals of foreign pulp continue to be large. Just for example, shipments reaching New York this week have included 2,700 bales from Trondhjem, 3,938 bales from Gothenburg, 12,600 bales from Helsingfors and 1,105 bales from Rotterdam.

RAGS.—The papermaking rag market lacks important activity. Few mills are operating as buyers, and those that are placing orders off and on are absorbing together but a light total amount of goods. Felt mills appear to be well stocked, and writing paper manufacturers apparently have all the rags in store that they need for a time, and with these two major classes of consumers mostly out of the market, there is but a narrow outlet for supplies. Prices depend largely on the dealer issuing them. If the dealer is hard pressed financially, he is apt to name low figures with the hope of obtaining an order; if on the other hand the dealer is not obliged to convert rags into money, he is likely to be more independent concerning values, because it must be said there is a feeling among traders that prices are touching bottom and that any revival of demand from mills will cause values to advance.

PAPER STOCK. — Waste paper has strengthened considerably and prices on most grades are on higher levels than have prevailed in some time. This seems due more to a growing scarcity of old paper caused by the refusal of collectors to gather material at ruling prices than at any increased call for supplies from mills. No. 1 hard white shavings are quoted at around 2.90 cents a pound f.o.b. New York, No. 1 soft white shavings at 2.25 cents, ledger stock at 1.50 cents, No. 1 old kraft at 1.65 cents, old books and magazines at 90 cents a hundred, white news cuttings at 1.50 cents, folded newspapers at 40 cents and No. 1 mixed paper at 32½ cents. Even at these advanced figures dealers are accepting orders cautiously and are mostly refusing to contract for large tonnage for forward shipment, with the result that current business mainly involves small lots for prompt delivery.

OLD ROPE AND BAGGING.—Old rope rules quotably firm at around 4 cents a pound for domestic manila rope in No. 1 condition, and there have been reports of sales at slightly higher figures, mills in the West reported paying up to 4.25 cents at shipping points. Old bagging is dull and prices continue to recede, it being stated that No. 1 scrap bagging has been purchased by mills down to 60 cents a hundred pounds in New York.

TO RECLAIM PULP FROM NEWSPAPER.

Peter V. King is organizing a $200,000 company at Kalamazoo, Mich., which is to engage in the reclamation of pulp from waste paper. Plans call for the erection of the first unit this fall, with an initial production of 40 to 50 tons daily. Mr. King will use a reclamation system perfected by himself. He was several years general superintendent of the Monarch Paper Company and of late years has been western sales representative for Castle, Gottheil & Overton. For many years he has been putting all his spare time into the development of his present system of pulp conversion.



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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., September 8th, 1921. No. 36

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press. Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

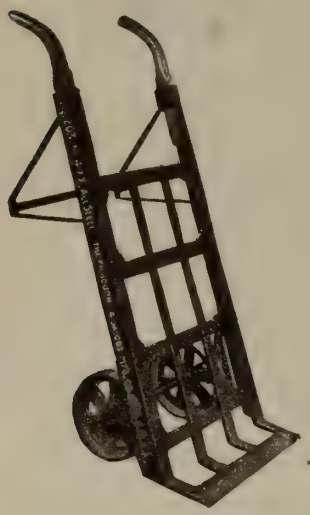
J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

THE TIDE HAS TURNED.

There are a good many people who are still looking through dark glasses at the present industrial situation and there are reasons for considerable apprehension in some respects with regard to the coming winter. The situation will be by no means an easy one for many people and the co-operative generosity and even sacrifice on the part of those more favorably placed, will be required in many instances to prevent extreme hardship on the part of those who will undoubtedly be affected by unemployment and short hours in industries which have recovered least from the world-wide business depression.

The Pulp and Paper Industry, while it has felt severely the general difficulties, has not been so seriously affected as some others although several important lines have registered almost a record for extreme dullness and recovery has not been as rapid as had been hoped for. On the whole, however, and with due consideration for the difficult problems which are still to be solved, and with recognition of the very considerable strain and burden still to be borne by many concerns in the industry, there is no doubt but that business generally is better than it has been for several months and that there is good reason for expecting a continued, though perhaps slow, improvement.

A feature of the situation which has caused considerable anxiety has been the dumping of European pulp at ridiculously low prices on the American market. This is a field which has been considered the natural outlet for Canadian production and the invasion of European pulp has naturally caused a lot of serious thinking. With kraft pulp, for instance, selling as low as 2c per pound in New York, there was good reason for suspecting something out of the ordinary in the transaction, instances of sales at prices which we are not only quite out of all proportion to the cost of production, but also quite outside the range of anything like equal competition by American producers, resulted in an investigation of the situation. Though certain that such pulp is being sold on this side for less than it brings elsewhere and as this is contrary to the emergency tariff bill which is still in force in the United States, it is entirely probable that such sales will soon cease. Another factor which is very likely soon to operate towards the elimination of unfair competition from European sources both with American and Canadian producers of pulp is the economic situation in Europe, particularly in Germany. Recent careful investigations over there indicate that cost of production is not going to continue at figures so entirely out of proportion to costs on this side as might be inferred from recent sale prices. The spurt of 12 to 14 hours of labor for a wage of almost nothing is bound to fade out and signs are not lacking that such is beginning to be the case. Furthermore, the better industrial situation in England and the slow, but sure recovery in Europe and other markets for pulp, will bring some relief to American and Canadian producers. It is one thing to dispose of stocks on hand at a loss in order to obtain ready money and it is another thing to continue production at a loss. Such operation cannot be carried on indefinitely and with prices of pulp even approaching production costs on the other side the outlet for the Canadian product must improve measurably. We feel that such an improvement is in sight although there may still be considerable stocks in the hands of consumers as well as some stores of high cost pulp at the mills. Some of these costs will undoubtedly have to be written off and charged up to profit and loss but, having done so, the field should be clear for new production at a profit, even at the reduced prices which are now ruling.

While we hear rumors every day regarding what the price of newsprint will be for the last quarter of the year, manufacturers seem disinclined to make a public statement with regard to it. The expectation of consumers is certainly that a price less than $95 per ton will be announced before the first of October and many of them are consequently holding off for any advantage they may obtain by ordering at a possible lower price. Some of them have pretty definite ideas as to how much the reduction will be. Anticipation of a reduction is being reflected and prominently featured in connection with stock quotations. Those who gamble in stocks always have their own reasons for their thoughts; it is barely possible however, that some of those who magnify the fact of a decrease in price lose sight of the possibility of a corresponding, though perhaps not so large, decrease in cost of production. The public during the past few years got a rather exaggerated idea of the earning power of pulp and paper mills and apparently based their calculations on the abnormal dividend paid a few times on common stock, perhaps losing sight temporarily of the sound though conservative possibilities of the preferred stock and bonds. Another feature has been the dividing of shares and the expectation that the same investment thus split would continue indefinitely to pay the same dividend on divided shares as was originally anticipated on the single share. Some of our mills have increased their earning power to an extent almost proportionate to the increased share units and most of the companies have maintained their ability to

pay dividends even though in some cases they have deemed it wiser to retain the cash for emergencies.

Our idea of the matter is that if a moderate cut in the price of paper will establish confidence on the part of the consumer to the extent of increasing the amount consumed, it will be better all round to sell the maximum output of the mill with the attendent employment of full staffs than to bolster up the price of any product in a falling market for the benefit solely of shareholders if such action might restrict consumption and react unfavorably on the chance of employing all hands in the mill. An employer's first duty is to provide employment. We feel that the next price that is announced for newsprint, if it is made on the basis of present cost of production, will stabilize the market to such an extent that consumption and production will be increased.

ARTICLE POSTPONED.

On account of a delay, doubtless caused by the holiday, in the arrival of several cuts, the article on the "Structure of Straw", which was promised for this week has to be held over till next.

MR. GRAY LEAVES GARDEN CITY PRESS.

Mr. F. W. Gray, whose office has been just down the corridor has accepted the position of assistant to D. H. McDougall, vice-president of the British Empire Steel Corporation. Mr. Gray came to Canada in 1904 in the service of the Dominion Coal Company, remaining with them until 1918, as confidential assistant to various general managers. He went to the Nova Scotia Steel & Coal Company in that year, remaining for one year. In 1919 he became editor of the Canadian Mining Journal and of Iron & Steel of Canada. He received his early training in South Yorkshire coal mines under the late G. Blake Walker, recently president of the institute of Mining Engineers. Mr. Gray is a member of the latter society; member Canadian Mining Institute, and ex-council member and associate member Engineering Institute of Canada.

Our best wishes go with him.

COBWEBS.

An American paper mill is suing the company that sold it sulphite pulp. After using 100,000 pounds the mill found itself duped "through false representation." The $63,000 damages claimed would pay a competent chemist a long while, and protect the mill on quality material. The idea of using 50 tons of pulp without knowing its quality!

The editor made a curious mistake in referring to Consolidated Water Power and Paper Co. by mentioning George H. Mead as president of the Company. The head of the Wisconsin Company is George W. Mead, and our hearty congratulations are extended to him on the success which he, too, has attained.

As if in answer to our suggestion for better co-operation between paper mills and public schools, the Abitibi Power and Paper Co., at that very time was entertaining the school teachers of Ontario. Helpful programs were distributed and, after a trip through the mill, an instructive lecture on the Manufacture of Pulp and Paper was given. The example should be followed by others.

It is significant that 80 per cent of the area burned over by forest fires in New Brunswick this year had been previously burned. That indicates an unfortunate disregard for the future, since such a fire will have destroyed the young growth that has just got a good start, as well as most of the seed remaining in the soil, and will not only retard the reforestation of such areas, but induce the growth of less desirable species.

The Laurentide Company has issued an excellent report for the year ending June 30. It is Canada's Old Faithful; happily, several other large companies are now in the class of consistent performers.

The whole American people and every lover of a wonderful tree owes a debt to the National Geographic Society for assisting in the purchase of the area containing the Sequoia, the giant trees of California. The ownership and enjoyment of the biggest trees in the world are thus preserved to the people.

The Pulp and Paper Magazine can deliver promptly, Cross & Bevan's standard textbook on Papermaking at $10, and Hobart's excellent practical book on Millwrighting at $4.75.

A COMPREHENSIVE TEXT BOOK.

This is the title given to the review by Sindall & Bacon in the August number of the Paper Makers Monthly Journal of the Text Book in preparation by the Industry. The review covers volume 2 of the series. Messrs. Sindall & Bacon point out that there are unavoidable disadvantages to a discussion of such large subjects as Mechanics, Hydraulics, Electricity and Chemistry in such small compass and predict that the presentation of the subjects as given will inspire the student to further reading.

With regard to the Chemistry they say: "Here again the matter has been presented for the benefit of students who know little or nothing of the elements of the science and the interest of the students is maintained by frequent references to the application of theoretical chemistry to problems which occur in the mill."

The review concludes: "We recommend the purchase of this book by students who desire to master all the elements of scientific application, since a careful perusal and understanding of the subject matter should inevitably inspire the reader to seek further information by going deeper into the whole question and in this sense the volumes will serve not only as reference and text books but as a logical introduction to further study."

Spanish Customs Tariff

In view of Canada's ever-increasing exports of pulp and paper, the following list of duties, quoted from the Supplement to the Board of Trade Journal for July 28, will be of interest.

In the proposed new Import Tariff the projected rates under both the "First" and "Second" Tariffs are shown. In this connection, it is desired to explain that, in virtue of an Exchange of Notes between the Spanish and British Governments of 1894, products and manufactures of the United Kingdom are entitled to the application of the "Second" Tariff rates on importation into Spain, together with any reductions of those rates which may be granted by Spain, by Treaty, to other European States, with the exception only of such special Tariff concession as Spain may accord in favour of goods of Portuguese origin. Products and manufactures of other parts of the British Empire are entitled to similar treatment on importation into Spain, with the exception only of the Commonwealth of Australia, which has withdrawn from the Arrangement of 1894. The Arrangement in question can only be terminated by one of the Parties giving six months' notice of denunciation, to the other, and such notice has not yet been given by either the Spanish Government or the British Government. The practical effect of the Arrangement is to guarantee British products and manufactures against differential Tariff treatment in Spain.

The existing rates of duty are these set out in the Provisional Customs Tariff which took effect on the 21st May last, as modified in a few details by a Royal Order dated 3rd June. In the new Draft Import Tariff the classification of merchandise for Customs purposes has been greatly elaborated, there being 1425 separate headings in the proposed Tariff as compared with 718 in the existing Tariff.

In accordance with a Law of 1906, the Spanish Customs duties are fixed on a gold basis. Gold coins of countries constituting the Latin Union, as also of the United Kingdom and the United States of America, are accepted by the Customs at legal parity. Silver coins of Spanish currency and notes of the Bank of Spain are also accepted in payment of duty; but when duty is so paid, the amount due is subject to a percentage surcharge which, under the existing system, is fixed monthly, in advance, on the basis of the average quotation of fine bar gold in London and the average sight rate of exchange of the pound sterling on London in the Madrid Exchange during the preceding month. For the present month (July) this surcharge, or gold "agia" is 46.84 per cent. The surcharge, fixed month by month, is regularly notified in the "Board of Trade Journal."

CLASS VII.—PAPER AND MANUFACTURES THEREOF.

Group I.—Raw Materials. *

Wood pulp	1st pes. c.	2nd pes. c.
Mechanical (1)	1 50	0 50
Chemical (cellulose) (1)	1 80	0 00
Clippings of paper, cardboard, rope, twine, etc.: waste paper, and fibrous material in fragments	0 25	0 10
Old rags of vegetable fibres for making paper pulp (2)	0 45	0 15

* Duties on Raw Materials are figured on **gross weight.** All duties are calculated per 100 kilograms, except where marked "kilog.", when 1 kilogram is the unit.

Group II.—Paper unmanufactured (en rama) (3)

Endless paper for printing or wrapping, not cut (4).		
White or colored, glazed or not, weighing per square metre:		
Up to 20 grams inclusive	150 00	60 00
From 21 to 45 grams, containing mechanical wood pulp (5)	120 00	40 00
46 grams and upwards, containing mechanical wood pulp (5)	90 00	30 00
From 21 to 45 grams, without mechanical wood pulp (5)	125 00	50 00
More than 45 grams, without mechanical wood pulp (5)	113 00	45 00
Unsized (6):		
Polished (*alisado*) or glazed, weighing from 46 to 61 grams per square metre, in rolls and containing more than 60 per cent. of mechanical wood pulp, in sheets (5)	25 00	8 50
Polished (*alisado*) or glazed, weighing from 40 to 61 grams per square metre, containing more than 60 per cent. of mechanical wood pulp, in sheets (5)	50 00	10 00
Paper in sheets or reels, weighing 61 grams and upwards per square metre, and containing more than 60 per cent. of mechanical wood pulp (5)	90 00	18 00
Of any weight or color, without mechanical wood pulp, and with water marks (5 and 9)	163 00	65 00
Of the natural color of the pulp, not bleached nor glazed, weighing per square metre:		
Less than 20 grams; or paper for wrapping fruit	90 00	36 00
20 grams or more, unsuitable for writing or printing; or common packing paper such as straw paper, cap paper, and coarse brown paper	60 00	20 00
Paper on rolls (*semi-ordinario*), suitable for packing, colored (except white and *ahuesado*), satined or not, weighing 65 grams and upwards per square metre, and containing mechanical wood pulp	105 00	35 00
Other manufactured paper not specified in the Tariff	169 00	60 00

Group III.—Manufactures of Paper (7).

Paper:		
White or colored, cut, of any weight	210 00	70 00
Primed with gelatine or so called linen paper or deckle edge paper (*papel de barba*) made by hand or machine, and primed after manufacture (8)	195 00	65 00
Made with the Diana or like apparatus, the pulp containing special or fancy coloring (8)	150 00	60 00
Parchmented	135 00	54 00
Paraffined	120 00	40 00

With designs dry stamped, or imitations of edgings or lace (9)	3 00	0 90
Simply tarred	200 00	40 00
Tarred and reinforced on the inside or outside with thin fabric of cotton, jute or similar textile	180 00	60 00
Not tarred and reinforced with fabrics of any kind	200 00	70 00
Parchment, or paper prepared from cellulose acted on by sulphuric acid and afterwards washed with basic products, crystal and glass-like (*vitron*) paper	163 00	65 00
Coated on one or both sides with a mineral material, dull or polished	163 00	65 00
Covered with thin sheets (*hojuela*) of wood	330 00	60 00
Covered with a sheet (*lamina*) of metal or with metal powder or by galvanic processes	156 00	52 00
Paper and cardboard albumenised or coated with any substance whatever for photography:		
Sensitised	4 00	1 25
Not sensitised	3 00	0 75
Wall paper in rolls:		
Printed on a natural back ground	135 00	45 00
Printed on a dull or shiny back ground	225 00	75 00
Embossed with gold, silver, wool, crystal and similar materials	360 00	120 00
Cut up, cut out into flowers, crimped in the shape of lanterns, lamp shades, and other similar manufactures	3 00	0 90
Spun	3 00	1 00
Woven paper fabrics in the piece	5 00	1 50
Sacks and other manufactures with a basis of paper yarn or woven paper fabrics, not included in other Tariff Nos.	500 00	175 00
Cigarette paper:		
In tubes or cut into leaves for books	4 00	1 50
In packets (*librillos*)	5 00	1 75
Music paper	500 00	150 00
Cut:		
In strips less than 18 mm. in width	2 50	0 80
In rolls, from 18 to 300 mm. in width	2 10	0 70
Bags, with or without inscriptions	225 00	75 00
Paperboard (*cartulina*) (10):		
Without working or stucco		
Of a size equal to or greater than 50 x 65 cm.	125 00	50 00
Of a smaller size; and that of hand-made linen paper	163 00	65 00
Stuccoed and colored, goffered or not	160 00	80 00
Moulded into articles of any kind	200 00	100 00
Group IV.—Paper Stationery (1).		
Envelopes:		
Without crests, in boxes or packets of more than 200	300 00	100 00
With crests, and those without crests when imported in boxes of less than 200	375 00	125 00
Cases and boxes of writing paper, with or without envelopes, ruled or not, put up for retail sale, with the covers printed or not:		
Without crest	360 00	120 00
With crest	450 00	150 00
Account books, letter copying books, registers, copy books, counterfoil books photograph albums, stamp albums and the like; plain, ruled or printed (2)	270 00	90 00
Group VI.—Cardboard and Cardboard Wares (13)		
Cardboard:		
Not worked nor covered, in sheets of a size equal to or greater than 70 x 100 cm.	100 00	20 00
Of a smaller size, or stamped out by a single stroke of the press	90 00	30 00
Covered with paper on one or both sides:		
In sheets of 70 x 100 cm. or more	85 00	42 50
In smaller sheets	100 00	50 00
Covered or impregnated with asphalt, tar, or similar materials	45 00	15 00
Polished or burnished (drapers' board)	75 00	50 00
Stuccoed with mineral substances or covered with sheets of metal or wood	115 00	46 00
Cut out or bent, prepared for folding into boxes, with or without clamps	100 00	40 00
Cardboard boxes (14):		
Lined with fine or common paper, or without lining, and without gilt edge	150 00	50 00
Lined, with gilt edging, covered with paper, printed and with designs or ornaments of any kind	225 00	75 00
Lined or with parts made of any textile fabric	375 00	125 00
Manufactures of cardboard and papier mache not specified	360 00	120 00

(1) This number only applies to paper pulp perforated in such a manner that it can be used for no other purpose than the manufacture of paper or pasteboard. When the pulp is not perforated, the Customs will cut the sheets, at the expense of the importer, so that it may not be utilised for any other purpose. Pulp not perforated is dutiable as common pasteboard.

(2) This number applies only to rags which are used exclusively for the manufacture of paper. Importers must prove that the said materials have been used for the manufacture of paper, by means of a certificate from the Authorities giving a bond to pay the difference between the corresponding duties, which bond will be cancelled by the Customs Administration on receipt of the certificate.

(3) Unmanufactured paper ("papel en rama") means paper which has not undergone special manipulation since its manufacture, made in one operation ("de modo continuo"), without the addition of fibres or colouring by means of special apparatus.

(4) All paper, the smallest dimensions of whose sides is more than 57 cms. in the case of paper in sheets, or whose width is more than 30 cms. in the case of paper in rolls or on bobbins, is classed as unmanufactured paper, not cut.

(5) The presence of mechanical wood pulp can be detected by means of a drop of nitric acid, which will not have any effect if the paper does not contain mechanical wood pulp. To determine the proportion of mechanical pulp, fluoroglucin is to be used. This produces a red colouring, which is darker the more mechanical pulp there is in the paper; the approximate quantity can be determined by comparison with the standard specimen, allowing a tolerance of 10 per cent from the 60 per cent.

(6) All paper which permits lines made with pen and ink on one face to penetrate to the other is considered as unsized paper.

(7) Paper which during or after its manufacture has been subjected to processes which changed its form or exterior aspect is considered as manufactured paper.

(8) In order to distinguish these papers, it is sufficient

to scrape the surface, the ink being absorbed by the pulp, owing to the lack of size.

(9) Dry-stamped designs are distinguished from water marks because the lines of the former are more defined; the latter are found to be slightly stumped (difuminadas).

(10) By paperboard ("cartulina") is understood the product obtained by sticking together two or more sheets of paper; uncut paper in reams, the weight of which exceeds 200 grams per square meter, is also considered as paperboard.

(11) Articles obtained by varying the shape of the paper, ruled or bound and packed specially for retail sale, are included under this heading.

(12) The bindings shall be dutiable separately, according to kind.

(13) The product obtained during the course of manufacture by superimposing sheets of paper in wet state, without any adherent other than pressure, is considered as cardboard. The minimum weight per square meter is 350 gms.; that of less weight being dutiable as paperboard ("cartulina").

(14) Boxes of cardboard, lined with paper, which are imported as packing for handkerchiefs, shirt-fronts, buttons, piece goods, and similar articles, are free of duty, in accordance with Disposition V.

FRASER COMPANY HAD SUCCESSFUL 1920 BUSINESS.

Profits of the Fraser Companies, Limited, for the year ended December 31, 1920, show a good increase over the previous year. Profits from operations, after depreciation of inventories, amounted to $2,157,618. Deductions of $441,356 for interest and charges on bonds and bank loans, and of $439,960 for depreciation of plant and equipment, left net profits of $1,276,301, or 12.7 per cent. available for dividends on the common stock amounting to $10,000,000.

This is the first report of the company since the issue of $2,000,000 of first mortgage six per cent. serial gold bonds a few months ago. The report indicates that about $1,500,000 was available for the payment of 6 per cent. interest on the outstanding bonds of slightly less than $2,500,000, or over 60 per cent., this comprising the whole funded indebtedness of the company.

After allowing $279,462 for government taxes covering 1919 and 1920, there would remain $1,200,000 available for bond interest, or over eight times what was required. Of these taxes $185,000 has been paid since the beginning of the present year. After deducting $200,000 for the Fraser Memorial Hospital at Fredericton and $100,000 for dividends, there remained $976,301 to be carried forward to profit and loss.

After reviewing the year and the purchase of the Dominion Pulp and Paper Company at Chatham, N.B., Alexander Fraser, president of the company, says:

"The first few months of the current year witnessed a marked cessation in demand for pulp and lumber products. As a result, your pulp mills until recently, were not in continuous operation. Orders are now being received, however, in steadily increasing volume and your pulp mills at Edmonton and Chatham are now operating satisfactorily on current business."

The marriage of Katherine Sayers, daughter of Mr. and Mrs. Rowland Ford, of Portneuf, Que., to Mr. Robert Christopher Rowley, son of Mr. and Mrs. John Rowley, Westmount, Que., took place at half-past seven o'clock on Wednesday evening, August 31, at the Church of St. John the Evangelist, Portneuf, Que. Mr. Rowley and his bride have gone down the Saguenay for their wedding trip and will reside at Shawinigan Falls, on their return.

PAPER DUMPING TAKEN UP BY A.P. & P. ASS'N.

New York, Sept. 2.—Following the filing of formal complaint of dumping of foreign paper in this country by Dr. Hugh P. Baker, Secretary of the American Paper and Pulp Association, formal complaints have also been filed alleging dumping of foreign pulp by Secretary H. H. Bishop of the Pulp Manufacturers' Association, affiliated with the American Paper and Pulp Association. Unofficial advices are that there has been found to be sufficient evidence of dumping to warrant the customs authorities in requiring the filing of bonds by importers sufficient to meet any tariff that may be levied, pending further investigations by the government.

In his letter to the custom appraisers, Secretary Bishop, after quoting foreign publications to the effect that Scandinavian manufacturers must take a loss if they meet the German price of $3.00 per 100 ex-dock, U.S.A., says:

"The price mentioned in this extract is in fact, not as low as pulp has been offered in this market, and if at $3 per 100 lbs. Swedish manufacturers claim that there is a loss, then there certainly must be a greater loss at the lower prices and a condition must exist from which the Anti-Dumping Act was intended to protect American manufacturers.

"For your further information, and as a basis for such investigation as you will undoubtedly wish to make, we have before us a quotation made to one of our members which reads as follows:

100 tons strong unbleached Sulphite, imported, f.o.b. cars Baltimore, Md., 2½c per lb.

200 tons extra prime bleached sulphite, imported. f.o.b. cars New York, 4¼c. per lb.

50 tons bleached sulphite, imported f.o.b. cars New York, 4c. per lb.

100-300 tons No. 1 Kraft pulp at $2.40 per cwt., f.o.b. cars New York or Baltimore (sample enclosed).

Swedish unbleached pulp 2½ per lb. (sample enclosed).

German Mitcherlich pulp $55 per ton f.o.b. cars New York (samples enclosed).

"We also have knowledge of a sale of 1,000 tons of Scandinavian No. 1 kraft, delivery during October, November and December at $40 per ton ex-dock New York.

"This is the most aggravated case which has come to our knowledge and which you will note is not expected to arrive until October, November and December, thus affording ample time to investigate on the other side relative to market conditions."

SWEDISH PAPER MILL ISSUES BOOK IN ENGLISH.

An interesting, beautifully illustrated book of 108 pages with text in English, has recently been issued by Holmens Bruks och Fabricks Aktiebolag, which has headquarters at Norrkoping, Sweden. The mills, which turn out paper, mechanical and chemical pulp, imitation leather, and cotton yarn and cloth, are described in a brief historical sketch. There are also articles on forestry and farming projects in connection with the mills.

If people are doing their duty their duty as they see it they should go to an eye doctor.

Carelessness means Injury, sooner or later. It pays to be careful.

Wayagamack Pulp and Paper Company Ltd.

By A. R. R. JONES.

Emphatically a great Canadian enterprise is the Wayagamack Pulp and Paper Company, Ltd. of Three Rivers, Que. Indeed, the name and fame of its products are household words in the kraft paper trade not only in this country and in the United States, but also in Great Britain, France, Australia, New Zealand, South Africa and elsewhere. For it is the largest manufacturer of kraft-paper in the world.

With its large and conveniently-situated timber limits, its unexcelled facilities for getting out wood and for water transportation to its mills, and its capital railroad communications the Company's location at the junction of the St. Lawrence and St. Maurice rivers is one of the finest in the world for pulp and paper purposes. In 1910, when the concern was organized, it acquired the famous Baptist timber limits, amounting to 1121 square miles. The original owner of these was George Baptist, who established the first lumber mill on the St. Maurice Valley. In addition to the limits, it also purchased from the Baptist interests its present mill site on what was formerly called Isle de la Poterie, but is now known as Wayagamack Island. More recently, it purchased the Portneuf limits on the North shore of the St. Lawrence, amounting to 485 square miles, and the well-known Breakey property on the Gaspe Peninsula, 450 square miles in extent.

Company's Executive and Products.

Mr. C. R. Whitehead is president and general manager of the Company; Mr. Jas. W. Pyke, vice-president and chairman of the executive committee; Mr. George Henderson comptroller; Mr. E. L. Wilson, secretary, and Mr. D. L. Adams, treasurer. The employees number somewhere around 1500.

The products consist of sulphate or kraft pulp and kraft wrapping papers, glazed and unglazed. In addition to making paper for the Canadian market and exporting to the countries mentioned above, the Company also exports largely to India, China, Japan and to South American Republics. It is strongly represented in all the countries to which it exports, and in the markets of all of them its products are recognized as the standard of excellence in quality and strength.

Eleven years ago when the Company was incorporated under Dominion charter, Canada was obliged to resort entirely to importation to meet her needs in the way of kraft paper. In the interval which has since elapsed the kraft paper industry has made such phenomenal strides in this country that today she not merely supplies all her own domestic kraft paper requirements, but also does the larger portion of the British kraft paper trade, and a we have seen, exports that paper to all parts of the globe. The kraft paper that is being



Log Pile and Conveyor at the Wayagamack Pulp and Paper Company, Ltd.

turned out by Wayagamack Company is regarded by the experts as being not only equal, but actually superior, to the products of its Scandinavian competitors —which products were considered to set the standard of excellence for the rest of the world in the kraft paper industry before Wayagamack entered the field and assumed, by merit, its present pride of place.

The Plant and Equipment.

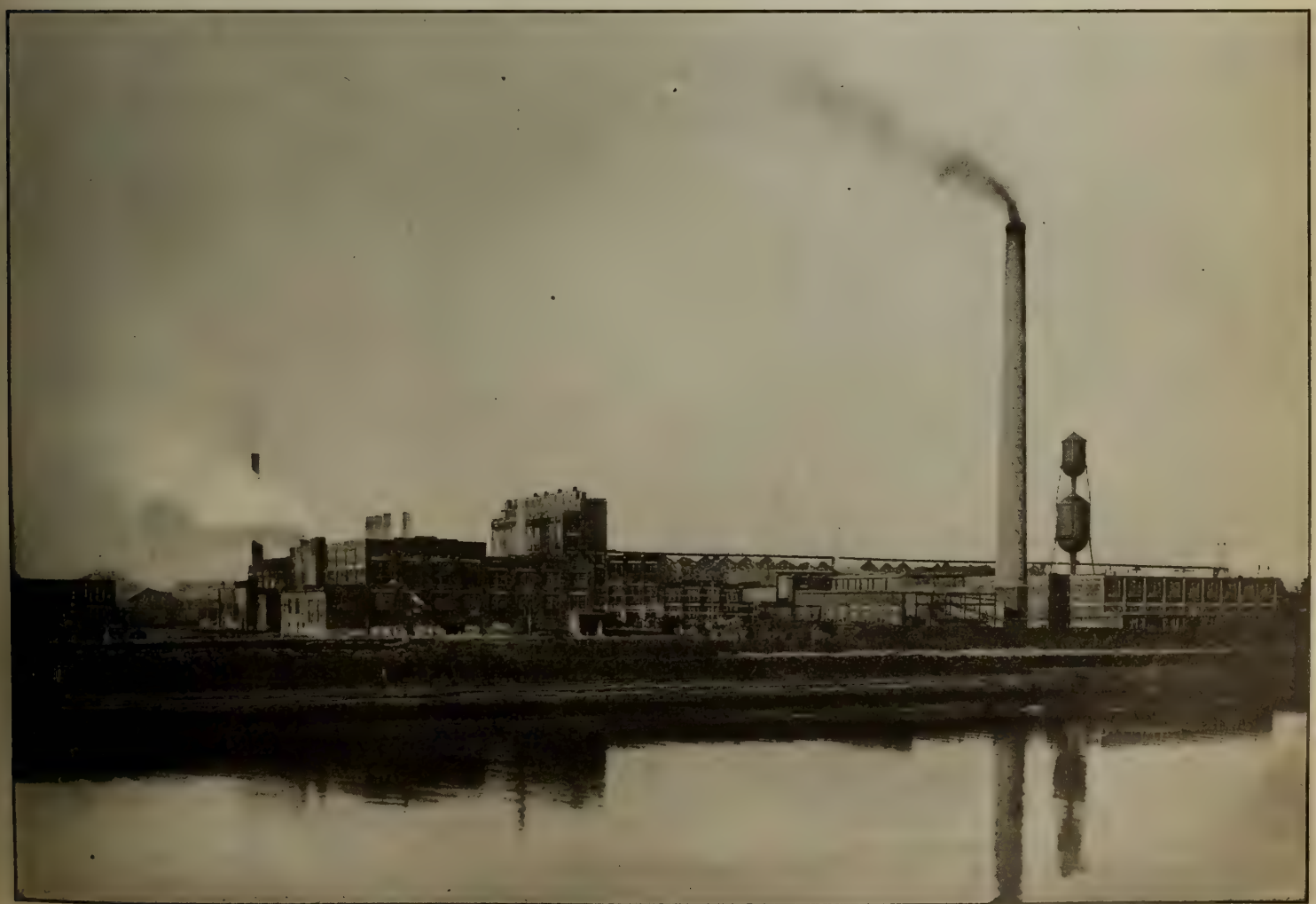
Construction of the mill was started in 1911, and in the autumn of the following year manufacturing operations were commenced. The original plant was built for a daily output of 50 tons of pulp and 50 tons of paper, but it has since been enlarged and now has a capacity of 250 tons of pulp and 150 tons of paper daily, being, as has been said, the largest kraft mill in the world.

The mill is equipped with English machinery supplied by Messrs. Bentley & Jackson, Ltd., of Bury, England, who specialize in machinery for kraft papers. In every direction of mechanical equipment, the Company has spared no effort to fit itself for every demand which may be made upon it. Nor is this true only of the mechanical side of the plant's activities. For the expert operators in the Company's employment are as highly skilled as it is posible to obtain anywhere. Indeed, the reliability of all the workers generally is a noteworthy feature of the organization, which is one of exceptional strength and harmony. The admirably coordinated activities of the management and all departments of the manufacturing and selling operations result in the wheels of the concern running with superlative smoothness. Labor is abundant and industrious and—not least important in these days—reasonable and contented.

New Grades are Being Made.

Some new grades of kraft are now being made by the Company. Until recently, it had not devoted attention to colors on a large scale, but it is now supplying a range of shades which are meeting with considerable favor. These shades include grey, green, blue, orange and maroon. The new grades include light weight papers made down to double crown 7 lbs., such as have never before been made in Canada, and, both in finish and in weight, they compare extremely favorably with anything of a similar nature made elsewhere.

Mention has been made of the large export trade done by Wayagamack. This has been built up solely by a steadfast adherence to quality of the highest. That its reputation for this quality should stand so high redounds not only to the credit of Canada but also to that of the British Empire as a whole. It is only quality that can make the impression in Great Britain which the Wayagamack products have indisputably made. For the British temperament is, other things being equal, usually disposed to think that because, in the past, a certain class of goods has not been forthcoming from a certain source, that source is unlikely, in the future, to supply that class of goods. But, only the other day, a large Manchester dealer, who had previously been disinclined to admit that Canadians could



The Mill of the Wayagamack Company, Ltd., which is the largest Kraft Pulp Mill in the World.

equal the Swedes in the manufacture of kraft paper, acknowledged, with reference to the Wayagamack unglazed and M. G. qualities, which had been submitted to him, that "from the general feel and look of the paper it appears to come up to the very best Scandinavian quality, and we are pleased to know that at last in our Empire we are able to compete with the foreigner."

Solely Devoted to Kraft Papers.

It is the distinction of the Wayagamack Pulp and Paper Company that, from the time it was organized right down to the present moment it has devoted, and is continuing to devote, its whole time and attention solely to the production of genuine kraft pulp and papers. Genuine kraft—the word "kraft," is, in origin, a German-Scandinavian, or Swedish-German word signifying strong—was, at first, regarded simply as a wrapping paper. But today it is used not only as a wrapping paper of the highest quality, but also in the manufacture of many important articles.

A very interesting article on kraft paper by Mr. W. H. Sheriff, of the Hodge-Sherriff Paper Company, of Toronto, which acts as agents for the Wayagamack Company in Great Britain and France, and which also looks after the Company's sales in this country, was published, last month, in the Toronto Globe, and has appeared in may other publications, including the Pulp and Paper Magazine of Canada, both in this country and in the United States. In the article in question Mr. Sherriff has described many of the uses to which kraft has been put. To many people it will be a distinct surprise that it should have played a definite part in the war. Yet such is the fact. "It was," says Mr. Sherriff, "used in the manufacture of explosives and many tons of kraft were used by various Munitions Boards in Canada and the United Kingdom in the preparation of rifle cartridges. A small wad of the paper was enclosed within the thin outer covering of nickel and took the place of lead." Kraft was also used to make sand-bags. Bags of kraft can be produced at a much lower cost than jute sacks; and hence they were in great demand during the war not only at the various battle fronts, but also for the protection of buildings in England from damage by enemy aircraft.

Kraft Envelopes and Containers.

It is not so very long ago that the use of kraft envelopes was almost unknown. Today they are made and sold all over the world in hundreds of millions. Their introduction has certainly been a good move in the direction of economy for those commercial houses which have adopted them. For kraft envelopes are only about a third or a quarter the price of envelopes made from jute on cloth-lined papers, and they have been proved to be fully as satisfactory to the user.

One of the commonest purposes for which kraft is used today is as a wrapper for foodstuffs—in fact, is fast in process of becoming the recognized wrapper, waxed or oiled for foodstuffs of a greasy kind. But it is also widely used in the form of bags—as containers for tea, coffee, sugar, fruits, candies, cement, lime, lime, nails, and hardware of every description. In the article quoted, it is stated that kraft is also largely used in the manufacture of workmen's overalls and, in this form, it is, one learns with surprise, both fine and water-proof.

Protecting Cereals From Rain.

The latest and most ambitious use to which kraft has been put is as a protection for wheat and barley stooks from rain in England where inclement weather so often interferes with the process of harvesting. Kraft for this purpose is used in the form of a strong sheet of kraft in the shape of a miniature roof capable of covering a stock of ten or a dozen sheaves. When the sheaves are stooked, these covers are placed and fixed over the stooks. The latter may then be left standing in the fields almost indefinitely, so far as weather conditions are concerned for the paper not only protects them from falling rain, but also absorbs any moisture that rises from the ground, and consequently the loss of valuable grain by adverse weather conditions is reduced to a minimum.

In fact, there seems no end to the purpose for which this very remarkable product can be utilized. One has heard of paper boots and shoes—or at least boots and shoes that while pretending to be otherwise have turned out to be made partly of paper—but boots and shoes frankly made out of kraft may in the not distant future, become an accomplished and general fact. At the present time, blinds, awnings, mattings, wallpapers and chair coverings are daily being made from kraft. Twines, too, are made from this paper, and it has also been used on account of its low cost combined with its ability to withstand rain, as a substitute for canvas in tents. When one considers that less than a dozen years ago kraft paper was absolutely unknown to the great majority of people in this country, its rapid progress in popular use and favor is something at which one cannot help but marvel.

A Large Lumber Business as Well.

Mention should certainly not be omitted of the fact that, in addition to its pulp and paper mill, with the extremely large capacity noted, the Company carries on a lumber business on a very considerable scale. It has an up-to-date Waterous double cutting Bandsaw Mill, and cuts about 20,000,000 feet board measure per annum of high quality spruce and pine which is exported both to Great Britain and also to markets in the United States.

The Company's facilities for both rail and water transportation have been noticed. It remains to add that it is fortunate in the fact that it can avail itself of abundant electrical power. For it has entered into a contract with the Shawinigan Water and Power Company, whose activities have done so much to develop the industrial side of the St. Maurice Valley district, for the supply of power necessary to operate its plant for a term of forty years.

Indeed, in every respect the Wayagamack Company may be regarded as in a position of unusual strength—and not least so in the policy, in one sense sanely conservative, and, in another, decidedly and wisely progressive, for which those who guide its destinies are responsible. The outlook for the immediate future cannot, one would judge, be regarded as other than distinctly favorable. The kraft trade is steadily improving every day. It is something that prices have reached the bottom and that there will be no further recession. Moreover, the gradual trade revival which the country is anticipating will give stability to the kraft paper market. Indeed it may be a question—the writer in this matter is giving his personal view only—whether prices have not fallen too low to be fairly proportionate to the cost of manufacture. As regards the export trade with Great Britain, now that the coal dispute in that country is out of the way, and other industrial troubles are in process of being cleared up, there must, one would judge, be a considerable amount of business in kraft that is ready to be placed.

Steel Belt Power Transmission

The loss in power transmission from the engine, whether steam or electrical, to the point of application is a difficulty which has always exercised the minds of engineers wherever mechanical power is used. Experimental attempts were made in employing driving belts of metal, but after a short period of use they invariably broke when subjected to any considerable increase in load. Persistent failure always attached itself to the various connections used in joining the ends of the bands together. Subsequent experiments showed that these unsatisfactory results were attributable mainly to mistaken conceptions as to the conditions under which steel bands should be used. In calculating and constructing metal belt gearing on the occasion of previous experiments it was found that consideration was not given to the fact that the metal belt employed is subjected to a flexure constantly varying from zero to a maximum, and that to ensure durability with such a demand it was not sufficient for the belts to be calculated in the usual manner. The error consisted in not regarding the result of philosophical researches first undertaken by Wohler, according to which a tension constantly varying from zero value to a maximum and frequently applied to a body causes self destruction if the maximum tension is not confined to half the breaking stress of the material.

The present system is therefore based on the knowledge that a fracture of the belt, even with a constantly varying demand on its flexibility, can be avoided with certainty if the maximum demand likely to occur is kept so low that it does not attain half the value of the limit of fracture. Exhaustive series of trials have been carried out in England. According to the present method breaking of the belts is avoided, and the durability made unlimited by the thickness.

It was found that owing to the high modulus of elasticity of steel that it was very necessary to determine the length of a driving belt with considerable accuracy, a short extension, compelled by cutting the belt too short in the first instance, set up very serious stresses. To accomplish this purpose an ingenious device has been invented for determining the necessary length for the purpose of obtaining a truly correct working tension.

The Joint.—In the patented joint, clamping plates are shaped to suit the pulley profile, stresses at the joint are distributed evenly over the whole width, and one of the most prolific causes of fracture in the early installation is thus avoided.

The Material.—The Material used is a carefully hardened charcoal steel, prepared by a secret process, rough rolled at a red heat, and then brought to 0.2 to 0.9 mm. thickness and 12 to 200 mm. in width by cold working. The tensile strength of the finished material is about 95 tons to the square inch. The edges are rounded and finely finished, so enabling the belt to be safely handled even when running at high velocity. The elasticity remains unimpaired with use.

Friction Covering on Pulleys.—So that metal does not run to metal and to prevent any possible slip, a friction coating consisting of a layer of canvas, to which is glued fine sheets of cork, is placed over the pulley rim, and to avoid stripping under variable load, the pulley rim is first serrated by a rough file or chisel cuts. A special cement is available for use in very damp situations.

Conversion from Rope Driving.—Steel belts have to a great extent replaced cotton rope drives in a number of important applications. The simplicity of the conversion is such that the conversion of a complete rope race can be undertaken on a Saturday noon and be completed with the steel belts ready for running the following Monday morning. The conversion usually increases the horse power available at the driven shaft by 7 to 25 per cent., this being the result of a number of tests in actual installations. Over 250,000 H.P. of cotton rope drives have been already converted to steel belt transmission. Where space is cramped and drives are running to various floors, steel driving belts will solve many difficulties of the architect and millwright.

The requirements necessary to the successful employment of steel belt transmission are simple, but nevertheless important, and given suitable conditions, the results are definite and certain. When it is understood that steel belts must run perfectly true on to the pulleys, the tension to remain exactly as when fitted, the conditions demanded will be easily comprehended. The shafts, bearings and fixings must be of a solid construction, strong enough to transmit the maximum load demanded. The shafts must also be parallel, and the pulleys running true and without vibration.

Power for power, the steel belt is only one-third the width of an equivalent leather belt, the use of specially narrow and correspondingly stronger pulleys enables considerable saving in weight to be made, particularly in large diameters, at the same time reducing considerably the cost.

It should be clearly understood that the steel belt is only part of what actually is a highly scientific system of power transmission. As already explained, the process of preparing the steel and the mounting of the belts is carried out on highly scientific lines.

Safeguards.—With ordinary care steel belts are safer in use than leather or ropes. In case of fracture the belts will not fly, but fall between the shafts. The edges are rounded, and can be handled whilst running. In every country where used they are placed under precisely the same laws and regulations as applied to ropes or leather belts.

1.—An efficiency in power delivery of 99—99½ per cent.

2.—Great steadiness; a necessity for electrical machinery, textile purposes, paper mills, etc.

3.—A perpendicular drive is no disadvantage for steel belt driving.

4.—Absence of stretching. A steel belt does not stretch by use, as has been seen by eight years' experience.

5.—Even running, free from slip. As there is no actual measurable slip, it follows that transmission by steel belts is uniform and invariable.

6.—Narrower width. A steel belt is only about one-third as broad as a corresponding leather belt, consequently the pulleys will not cost so much.

7.—Great power under present conditions. In cases where the pulleys are limited in size it is often possible to get an increased power transmitted by the use of steel belts without any re-arrangement. For example, a firm had a main drive fitted with ropes capable of transmitting 150 H.P. using all the grooves. Desiring to increase the power to 250 H.P. this was accomplished by the use of one 8-in. steel belt which occupied only one-third of the width of the rope pulley, thus saving the expense of a new rope drive. Many such examples could be given.

8.—Cool bearings:—Owing to the exact calculations of the necessary tension for each particular drive together with the great reduction in the weight of steel belt as against an equivalent power and weight in ropes or leather; there is a minimum of strain on the bearings, which consequently run cooler.

9.—Cleanliness. No messy dressings are required.

10.—Durability. Steel driving belts have now been in operation for eight years, and tests made of the belts first fitted show no signs of deterioration whatever. It seems evident therefore that the life of the steel belt is unlimited.

Breakages.—Where the conditions are in accordance with the requirements, it is only in very isolated instances in which a fracture occurs. These instances are invariably due to a flaw in the material itself and will show within the first eight weeks of running; by this is meant that if a steel belt runs for eight weeks it is a practical certainty that it is free from flaw and will run indefinitely. To cover any stoppage caused by a faulty belt, the manufacturers will, if requested, supply with every drive a duplicate or reserve belt, measured and ready for immediate fitting, which is left with the customer.

Steel belts vary in width from 2½ in. to 10 in. and thickness 0.4 to 1.0 mm.

Cost.—Including pulleys, drives of steel belts are less expensive than drives of leather belts or cotton rope. Exclusive of pulleys, steel belts are considerably cheaper than leather belts and slightly more expensive than cotton ropes.

As these steel belt drives are designed from scientific formula, that accurate information be given to the representatives of the manufacturers of the steel belts is absolutely essential.

The conditions necessary for steel belt transmission is more exacting than those required by ropes or leather belts,

The well known Messrs. Jones & Glassco, Reg'd. of Montreal, Power Transmission Specialists, have secured the selling rights for steel belts in Canada. They have made an exhaustive study of this subject.

Messrs. Jones & Glassco advise having inspected steel belt drives in operation in England where there are over 50,000 H.P. varying from 20 to over 800 H.P. drives in successful operation. Also they advise having received testimonials from a large number of users, all of which evidence the greatest satisfaction with steel belts, many of whom have had these steel belt drives in operation over eight years.

As steel belts may be supplied in multiples, there is no limit to the possible power to be transmitted.

TOO BUSY TO READ.

"An hour with a book would have brought to his mind
The secret that took him a whole year to find.
The facts that he learned at enormous expense
Were all on a library shelf to commence.
Alas! for our hero; too busy to read;
He was also too busy, it proved, to succeed.
"We may win without credit or backing or style
We may win without energy, skill or a smile,
Without patience or aptitude, purpose or wit —
We may even succeed if we're lacking in grit;
But take it from me as a mighty safe hint —
A civilized man cannot win without print!"—Ex.

The world looks not at your faith but at the kind of life your faith causes you to live.

CLARKE BROS. MERGER.

At the annual general meeting of Clarke Brothers, Ltd., held at Bear River, N.S., on the 1st instant, the proposal to amalgamate with Bear River Pulp and Paper Co., a subsidiary, was unanimously approved and, at a special general meeting immediately following, a by-law authorizing an issue of $2,000,000 seven



MR. W. G. CLARKE.
Chairman, Clarke Bros., Ltd., Sulphate Pulp Manufacturers, Bear River, N. S.

per cent. eighteen-year bonds, mainly for refunding purposes, was adopted. The following officers were elected: Mr. W. S. Clarke, Chairman and Treasurer; Mr. W. W. Clarke, Secretary; F. W. Fraser, St. John, Charles T. Stark, Toronto, Harry L. Stark, Toronto, Alexander Fasken, Toronto, and A. G. MacIntyre, Bear River, Directors.

NEW U. S. MILLS PROJECTED.

"The Fourth Estate" understands that a very carefully considered newsprint mill, designed to be classed among the big ones, located in the Northwest of the United States, ready for financing when the war broke out, and since that time held in abeyance, may be expected to begin construction, in the relatively near future, as it is understood that its financing has recently been completed.

It is understood that the great Pacific shipping magnate, Robert Dollar, has perfected his plans to build a newsprint mill in Philadelphia, which will be served with groundwood and sulphite from Pacific coast mills, these supplies being handled by the Dollar freight ships through the Panama Canal; all of which means that there is added newsprint tonnage in sight from mills operating in the United States.

There is also reason to believe that the project considered by Mr. Jeffries of the Birmingham Age-Herald, to manufacture newsprint from Alabama spruce pine, which is said to be available in the northern part of Alabama, will soon be under way.

Life does not hold enough of years in which we can repay a mother's love — but do your best before she goes away.

THE FIRE SEASON IN NEW BRUNSWICK.

Weather statistics recorded by the Federal Stations in New Brunswick show the present fire season to have been the driest for over half a century. Periods of from six to twenty-five days occurred without any rainfall, not even showers, with the precipitation from 30 to 70 per cent below the average for the various stations during the months of May, June and July. This condition coupled with drying winds and extremely hot weather not only dried out the field crops but made conditions in the forest the most hazardous for fires on record, and rendered fire fighting very difficult on account of the lack of water in the swamps and brooks and the very dry condition of the soil.

Statistics for the fire season have not been completely compiled at the time of writing, and may reveal some changes upon closer investigation. About 300 fires have been reported, of which 200 required extra crews of men to extinguish. About 60,000 acres were burned over, 80 per cent of which was previously burned over land. Forty per cent of the area burned was privately owned land. The cost of extinguishing is in excess of previous years. The most serious day of the year was on August 6th when a very heavy windstorm swept across the southern part of the province, rendering the control of fires very difficult. Several residences at the summer resort of Westfield were burned as well as five houses at the village of Gagetown.

Causes of Fires.

Fishermen, campers, picnic parties and others in the woods were the cause of about fifty per cent of the fires. Railways caused twenty per cent, settlers fourteen per cent, while thirteen per cent are charged to miscellaneous causes. Lightning has, for the first time in the experience of the Department, caused serious fires three per cent being attributed to this cause due no doubt to the extremely dry weather and thunder storms, not followed by heavy rains. The very dry condition of the woods accounts to some extent for the large number of fires charged to camps as it was found that in several cases fires spread from campers' fires where the parties had not used precaution and put water on their fires.

Apart from the loss of property at Westfield and Gagetown the damage to standing timber has been small this year in proportion to the hazard, but the damage to future forests by the destruction of young growth is serious. Complete statistics are not yet available regarding the amount of timber burned. The damage caused from the different sources of fires is not in the same proportion as the causes. Settlers' fires caused practically no damage this year, while the damage from railways is also small. The restriction placed on all slash burning on May 10th, which prohibited the issuing of fire permits, accounts for the reduction in the number of fires and damage caused from settlers' fires.

Fall burning of slash is being agitated throughout the province. Out of the total number of fires, over half were extinguished before spreading over five acres. Over 1,000 temporary fire wardens were on the lookout for fire during the dry periods. The lookouts rendered valuable service in forest fire detection and the hearty co-operation of all the lumbermen in supplying equipment at the fires was of considerable aid in quickly organizing fire fighting crews. The co-operative wardens of the licensees and private land owners have rendered valuable service.

Forest fires may only be reduced by eliminating the causes. As stated above, the restriction on slash burning has practically reduced the danger from slash fires and the precautions taken by the railways in keeping their locomotives in condition and patrolling the right of way has materially reduced the railway fires. Fishermen and compers' fires must be controlled, and in view of the comparatively large damage and large number of fires attributable to this cause, the Department now has under consideration legislation prohibiting fishermen and others from entering the forest in the dry season without a permit from the forest ranger.



SIR WILLIAM J. POPE, K.B.E., F.R.S.
Head of distinguished British Chemists attending annual convention in Montreal and visiting Canada and the United States.

THROW IN YOUR CLUTCH.

I am inclined to think it is even more important that the distributor should keep himself in readiness for business when it comes than it is for the producer. The distributor is dependent upon his relations with the consuming public. These relations may be ever so cordial and apparently dependable; but human nature is fickle, and people soon forget you when you neglect to cultivate them. If anything, there is more need to keep in touch with a customer when he is not buying than when he is. So long as he is being regularly supplied with the goods of a certain house he is not apt to look for another source, provided the dealings are satisfactory. But when there comes a pause in activity and his business is practically suspended, he may in the interim get weaned away from his old business connections; and when he starts in again there is danger of his experimenting with new people. If a salesman is worth while, he may render a valuable service to his employer when times are dull, even if he does nothing more than keep up a business acquaintance with his old customers. —Judge Moore, in the United States Paper Maker.

The basis of business is confidence and the basis of confidence is understanding.—Mason's Monthly.

They call it a monarchy, but it is King George the Fifth and Lloyd George the Four-Fifths.

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. Analysis of Wood. Svensk Pappers-Tidning, 6, 1921. The author describes the Kramfors methods of determining resin and cellulose in wood.—P. B.

A-14. Analysis of Mineral Matter of Paper. J. SCOTT, **Paper Maker and British Paper Trade Journal,** lxi, 4. Describes the processes of testing samples of paper with the object of ascertaining the nature of the various loading materials contained in it.—A. C.

A-15. Analysis of Moisture in Pulp for England. Svensk Pappers-Tidning, 23, 1920. Complaint is made that Swedish and Finnish pulps are deficient in dryness. Estimation of the moisture content by the method of SINDALL and BACON, or the British official tests, is liable to errors of various kinds, caused in a measure by the nature of cellulose and the absorption of moisture in transit. Moreover the sample taken may not be a good average specimen of the shipment, and consequently of the cellulose as a whole. Cellulose, too, is of variable character. Competent inspection, sampling, and testing are the only means of arriving at the moisture content and a standard method of testing.—P. B.

A-15. Hydrolysis of Cellulose. Finsk Pappers-Och Travarutidskrift, 7 (September 15), 1920. ghe formula of cellulose is as yet unknown, though it may be shown that it is an aldehyde of glucose. The formula has the following characters: (1) Its highest nitration point is nitrocellulose with six atoms of carbon; (2) its highest acetyl derivative is a triacetic acid ester; (3) with strong alkalies in solution cellulose forms a sodium compound, which is decomposed by water, whereby cellulose is hydrolyzed—in this form cellulose is readily soluble in zinc oxide and alkaline cuprammonium oxide; (4) if the sodium compounds of cellulose are treated with carbonaceous sulphur, cellulose thiocarbonate is formed, which is readily soluble in water; the thiocarbonate is very unstable and is decomposed by acids, acid salts or ammonium chloride, whereby cellulose is simultaneously hydrolyzed; (5) cellulose does not react with phenylhydrazin or hydroxylamin, whence it follows that a CO-group is excluded, that is, no aldehyde or ketone group is taken up; on the other hand one can easily form a hydrolyzed product in which a CO-group occurs; (6) the end product of the hydrolysis of cellulose, with sulphuric acid, for example, is glucose; (7) from cellulose when treated with halogens in ether or chloroform solution, is obtained w-chlormethylfurfural or brommethylfurfural; (8) if cellulose is oxidized, oxycellulose is formed, which has a distinctly acid character and when distilled with dilute HCl gives furfural. Cellulose hydrate is obtained by mechanical separation of cellulose in water and drying at ordinary temperature; by the action of salt solution; by the action of alkalies; precipitation of cellulose from solutions; precipitation of cellulose esters; and by the action of acids. The molecular structure of cellulose hydrate is unknown. Hydrocellulose is likewise obtained by treating cellulose with acids. Like cellulose it is fibrous. Finally, as mentioned before, oxycellulose is formed by oxidizing substance.—P. B.

A-15. Acetolytic Decomposition Products of Cellulose. R. PROSIEGEL, **Zellstoffchem. Abhandl.,** i, 1 (June 15, 1920); **Paper,** xxviii, 7 (April 20, 1921). An extensive investigation into the intermediate products of decomposition of cellulose by acetolysis—dextrin acetates and cellodextrins. Translation by Clarence J. West.—A. P.-C.

B-4. Jack Pine for Paper. World's Paper Trade Review, lxxv, 18. In the House of Commons at Ottawa, Hume Cronyn mentioned that a pulp mill had found means of using Jack pine for the manufacture of paper. —A. C.

B-9. Source of Pulpwood in Japan. World's Paper Trade Review, lxxv, 18. There are vast forests in Karafut where two kinds of timber grow that are suitable for pulp. The supply is said to be inexhaustible. Five pulp mills have already been established and five more are projected. In the near future it is estimated that 100,000 tons of pulp will be produced annually.—A. C.

B-9. Prodigal Use of Forests in America. WILLIAM SCHACK. **Paper Maker and British Paper Trade Journal,** lxi, 4. An article on the prodigal way in which America has used her forests and a summary of the "Snell bill."—A. C.

B-0.; N-7. Rainfall Statistics. KENNETH ALLEN. **Engineering News Record,** lxxxvi, 14. A study based on records at Central Park, New York, for fifty-one years.—A. C.

D-4. Voith's Magazine Grinder. Tidsskrift for Papirindustri, 6 (April 15) 1921; **Pappen-und Holzstoff-Zeitung,** xii, 1921. Magazine grinders produce an even pulp without large slivers. Their advantages are: saving of labor, one attendant being sufficient; skilled labor is not required; the wood is warmed by the action of the stones; economy or horsepower.—P. B.

E-1. Analysis of Sulphite Cooking Acid. Svensk Pappers-Tidning, 21 (Nov. 15) 1920. The results of titration can vary within considerable limits. The carbonic acid values found by Oman, using the alkalimetric method, are too high, and he ascribes too great an influence to this substance. Klason, who took an opposite view, has shown, by employing the method of Henry-Dalton that the crude SO_2 can actually contain no more than approximately 0.001 percent carbonic acid. Similarly, employing the methods of Winkler and Hohn, Klason obtained constant results. Oman, also, found low values for lime, using the alkalimetric method, while Thorbjornsson with Winkler's method found them 5 to 6 percent to high. The causes of these differences, in his opinion, is the splitting-off of sodium sulphite by hydrolysis during titration. "This explanation is likewise not exactly right." It can easily be shown that the solution in which titration is carried out, is about 1/200 normal Na_2 SO_3, because to this solution is added 1 Cc. of the original acid with about 1.60 percent of free acid in 100 Cc. of water. In such dilution dissociation by sulphurous acid cannot lead to an increased hydrolysis of salts. As a matter of fact the relatively weak dissociation of free acid produces a degree of hydrolysis amounting to about 0.00015 to

0.0003 per cent. Moreover in nearly all mills, without exception, the alkalimetric method gives free acid values that are from 5 to 15 per cent too high. This is true of the raw acid as manufactured by the tower system or by the American Bottich process. The errors introduced by the presence of carbonic acid may best be avoided by employing the newer methods of Streeb and A. Sander and the "modified" Hohn method (Methyl orange and paranitrophenol as indicators).—P. B.

E-2. Sulphite Spirit as Motor Fuel. Papir-Journalen, viii, 14 (August 14), 1920. Previous attempts to use mixtures of sulphite spirit and benzol had not been without injury to machinery. Professor Hubendick has written a report on new methods of application, the result of which has demonstrated the practical value of this fuel.—P. B.

G-11; N-7. Water Wheels and Save-Alls. Zentralblatt fur die Papierindustrie, xxxix (April 1) 1921. The author analyzes and compares the merits and demerits of the hydraulic wheel and turbine, preferring the former despite its many defects. Much economy lies in the new types of save-alls.—P. B.

K-12 Automatic Control for Sectional Paper Machine Drive. STEPHEN A. STAEGE, **Pulp and Paper,** xix (June 2, 1921). See **Paper,** xxvi (April 21, 1920); **Pulp and Paper,** xviii (June 10, 1920; 1145 (Nov. 4, 1920).—A. P.-C.

K-15. Newsprint Manufacture in Canada. Papir-Journalen, ix, 5 (April 9), 1921. A Scandinavian engineer, K. MAARTMANN MOE, makes a detailed comparison between the Canadian and Scandinavian newsprint mills and grinders. The Canadian mills are worked with less machinery and require consequently less power than the Scandinavian. Under the system in use in Norway and Sweden, however, the groundwood mills are operated more cheaply.—P. B.

K-16. Reenforced Wrapping Paper. A. LAMBRETTE. **Papeterie,** xliii (May 10, 1921). Brief description of the machine for making asphalt coated or asphalt duplexed wrapping paper reenforced by means of a fabric having an open weave.—A. P.-C.

K-22. Cigarette Papers. LOUIS SCHWEITZER, **World's Paper Trade Review, lxxv, 21.** Reproduction of an article in **Paper** describing the properties necessary in cigarette papers and some characteristics in manufacture.—A. C.

K-23. Blotting and Filter Paper. World's Paper Trade Review, lxxv, 21. An article describing the properties and characteristics of blotting and filter papers and ways of developing and improving the desired properties.—A. C.

K-23. Waterproof Paper. Paper Container, iv, 6. An extract from the bulletin issued by the executive committee of the Australian Advisory Council of Science and Industry dealing with the proofing of board and containers made from board.—A. C.

K-0. Standardization of Paper. W. H. HAZELL. **World's Paper Trade Review,** lxxv, 22. The present methods of dealing with paper are deemed unsuitable and changes are suggested in the methods now used as regards standards. The main points on which international standards could be fixed are (a) standard unit for sale; (b) standard thickness of paper; (c) uniform methods of packing; (d) uniform customs of the trade; (e) standard sizes.—A. C.

K-0. Cooperation in Paper Standardization. World's Paper Trade Review, lxxii, 22. Review of American Knitting Paper Company's "board sheet" announcement that seven national associations in the United States connected with the paper and printing trade are cooperating in the standardization of paper and printing.—A. C.

L-4. Manufacture of Paper Containers. Paper Container, iv, 6. The eighteenth article of a series on the manufacture of paper containers, dealing with the spirally wound tube of the round box or container.—A. C.

L-4. Corrugated Boxes. Paper Container, iv, 6. Extracts from a booklet issued by the National Association of Corrugated Fiber Box Manufacturers, which deals with the advisability of having standard names for the various kinds of corrugated fiber boxes.—A. C.

M-0. Containers for Viscous Substances. Paper Container, iv, 6.. The container is provided with a lip or scoop adapted to scoop up the contents on the rotation of the disk, the object of the invention being to provide means for covering the said lip or scoop.—A. C.

N-6. Steam Turbines in the Paper Mill. Paper Maker and British Paper Trade Journal, lxi, 4,. A paper by A. G. GROUNDWATER read at a recent meeting of the Aberdeen branch of the Technical Section of the Paper Makers' Association.—A. C.

N-7. Interstate Water Conflicts and Possible Solution. Engineering News Record, lxxxvi, 18. A discussion by representative engineers on the suggestion by R. I. MEEKER, in **Engineering News Record,** Jan. 27, p. 157, for interstate cooperation to avoid conflicts over water rights and also to further the more complete utilization of United States' water resources.—A. C.

N-0. Electric Steam Generation for Industrial Purposes. Paper Maker and British Paper Trade Journal, lxi, 4. Describes the uses of an electric steam generator in the chemical, textile and papermaking industries.—A. C.

Q-0. Hydraulic Fill Practice. JOHN E. FIELD, **Engineering News Record,** lxxxvi, 14. Details of construction of earth-fill dam, and showing how studies of flume lining place cast-iron plates first and green spruce blocks second in durability.—A. C.

R-5. Paper Pulp Supplies from India. WILLIAM RAITT, **World's Paper Trade Review,** lxxv, 19. A paper read before the Royal Society of Arts.—A. C.

R-13. American Paper and Pulp Association's Annual Meeting—Paper, xxviii, 7; **Paper Trade Journal,** lxxii. 16; **Paper Mill,** xliv, 16.—Account of the convention held in New York, April 14, 1921, including retiring president Sissons' address, Secretary Baker's report, resolutions passed at the general meeting, report of the tariff committee, report on industrial relations, and address of President S. L. Bush of the Cost Association of the Paper Industry.—A. P. C.

R-13. British Paper Makers' Association Meeting. Pulp and Paper, xix (May 12, 1921). Brief account of the meeting held in London in April, 1921.—A. P.-C.

R-0. Checking Industrial Waste. HERBERT HOOVER, Secretary of Commerce, **Paper,** xxviii, 6 (April 13, 1921). Waste in production is due to unemployment, lost time caused by labor conflicts, losses in labor turnover, failure to secure the maximum production of the individual (either from misfit or lack of interest) poor coordination of great industries, failure in transportation, coal and power supplies. lack of standardization, speculation, mismanagement, inefficient national equipment, etc.—A. P.-C.

PULP AND PAPER NEWS

Announcement was made last week of an important change in the management of the Whalen Pulp and Paper Company, Ltd. For several years past the Reliance Mill and Trading Company, a United States concern, has been in charge of production for the Whalen Pulp and Paper Company, but this arrangement has now terminated, and the Reliance has withdrawn from the operating management. The president of Whalen concern, the Hon. T. W. McGarry, formerly Provincial Treasurer for Ontario, has been in Vancouver in connection with the Company's affairs, with the object, it is understood, of arranging for the appointment of a staff to carry on operations. The Company's Woodfibre plant has been reopened, employing about 300 men.

A meeting of men prominent in the paper industry was held in Montreal last week. It is said that one of the matters under discussion thereat was the price of newsprint for the last quarter of the current year.

On the 31st August, a fire at Thunder Bay, Ont., destroyed the hardwood mill, boarding house, blacksmith's shop, oil houses, garage and docks of George Mason and Company. More than 600,000 feet of hardwood lumber, 1500 cords of hardwood slabs, several hundred thousand hardwood broom handles, and one barge, with its load of lumber, were also destroyed. The bulk of the stock was owned by George Mason and Company. Others interested in it are the Black Rock Lumber Company, of Buffalo, Huntington and Finke, of Buffalo, Walter N. Kelly, of Detroit, and Manley Chew, of Midland, Ont. As there is somewhere around six years' cut of hardwood lumber on the Christian, Hope and Beckwith Islands, near where the mill was situated, it is probable that Mason and Company will rebuild, but in the meantime seventy men have been thrown out of work.

A party, consisting of some two hundred school teachers of Ontario, has been touring Ontario's Northlands, and in the course of the tour, visiting the Abitibi Company's plant at Iroquois Falls, and other pulp and paper mills in that section of the country. Visits of this kind are invaluable as giving to the teachers, and, through them, to the children of the Province, a more adequate idea than is generally evinced both of the natural resources of Ontario and the importance of the pulp and paper industry in the industrial life of the Dominion.

The striking printers, after a meeting in the Toronto Labor Temple, last week, prayed for success in their fight for the forty-four hour week. The suggestion was made by a member that the printers might gain by prayer the results which they have so far failed to secure, and, following the meeting called for the transaction of business, a number of the strikers proceeded to one of the smaller rooms in the Labor Temple and engaged in a prayer meeting. It is certainly the first time in the history of the Toronto Labor Temple that a Trade Union, as a body, has fallen to prayer within its walls in the course of a dispute with the employers. The cynical profess to see in the incident an attempt to beat the Methodist Bookroom, which is the protagonist on the side of the employers, with its own weapons.

The Detroit Sulphite Pulp and Paper Company has been making extensive purchases of pulpwood in Ontario. This Company, a little while ago, took out an extra Provincial license enabling it to do business in the Province of Ontario, and has a yard at Fort William where it will make considerable extensions as soon as conditions are sufficiently improved to warrant them.

Sir George Foster, Minister of Trade and Commerce, has issued the following statement in regard to the appointment of Col. F. M. Gaudet as manager, and Dr. R. A. Ross as chairman, of the Honorary Advisory Council for Scientific and Industrial Research: "Formerly, we had an administrative chairman, who was a member of the board and carried on the work of the Research Council under the advice of the Council. The administrative chairman was paid a salary of $10,000 a year. Dr. McCallum having resigned from the office of administrative chairman on account of his appointment to a position in McGill University, and his subsequent mission to China, the office has since been carried on by Dr. Ruttan, of McGill University, in an honorary capacity. Dr. Ruttan finds it impossible to devote sufficient time to justify him in remaining in this position, though his services are still given as a member of the Advisory Council. The Advisory Council has, therefore, after fully considering past operations and the needs of the future, recommended that the office of paid administrative chairman be no longer continued, but that a technical expert and man of business experience shall be appointed to carry on the practical work of the Council, and be paid a sufficient salary therefor, the salary of administrative chairman to be abolished. The recommendation of the Council was approved and arrangements are under way to carry out the same, Col. Gaudet has been selected as technical expert and manager for a period of one year, and Dr. R. A. Ross, of Montreal, has been selected as chairman of the Advisory Council without salary."

Mr. J. O. Chenevert, of the Wayagamack Pulp and Paper Co. has left for Vancouver whence he sails on the Empress of Russia on the 15th for a 5 months tour, which will include Japan, China, Australia and New Zealand.

The City Council of Prince Rupert have made certain offers to the Prince Rupert Pulp and Paper Company Ltd., with regard to the supplying power for the proposed mill. The company has suggested that the acceptance or refusal of the offer be deferred for the present as the company's plans are not far enough advanced as yet to permit them to enter into such a contract.

The plant of the Alaska Pulp and Paper Company at Speel River, the only plant of its kind in Alaska at present, is closed. The management has stated that it will not be reopened until there is an improvement in market conditions as they cannot operate at a profit with pulp around $35 a ton coupled with freight rates of $12.40 a ton to Seattle.

LAURENTIDE CONTINUES TO PROSPER.

The financial statement of the Laurentide Co. is an exceptionally good one. The earnings are high, the position liquid, while a reserve of $2,000,000 has been built up as against depreciation of inventories—this latter item being a point on which there has been considerable controversy on the street. Bank loans, another point of contention, have grown in the year by nearly $3,000,000, but even with this they are more than offset by the company's investments which are carried as current assets as against bank loans as current liabilities.

For th year ended June 30, 1921, net profits amounted to $4,515,929, these being available for dividends on the outstanding capital stock of $28,800,000, or equivalent to 15.66 per cent earned thereon. This compared with net earnings of $1,499,539 in the preceding six months, equal to 5.21 per cent earned on the same capitalization.

Total operating profits amounted to $6,404,395, as compared with $2,401,550 in the preceding six months and with $2,743,374 in the 1919 fiscal year. Total income was $6,724,033 against $2,566,673 in the six months and with $2,955,979 in the 1919 year.

Reserve for taxes, depreciation and depletion is $1,322,843 against $762,687 in the six months and $745,396 in the 1919 year.

After deduction of dividends of $1,728,000 and the $2,000,000 reserve against depreciation of inventories, surplus stands at $787,929 for the year.

The balance sheet reveals many things that are interesting as well as illuminating. The fiscal position has been fully maintained in its liquidity. Current assets amount to $15,958,254 against $13,431,229 a year ago, with current liabilities $8,475,634 against $5,377,761 a year ago. This indicates a surplus of current assets over current liabilities (net working capital) of $7,482,620 compared with $8,053,468 as at June 30, 1920. While the net working capital in the present statement is at a slight decrease from a year ago, the difference is not particularly marked being less than $500,000.

The bank loans item is another interesting point in the balance sheet. This item stands at $5,067,945 as compared with $2,812,859 the previous year. Against this stands investments at $5,071,855 as compared with $5,071,695 the previous year. Cash is down at $20,116 against $280,452 last year. Inventories of logs, etc., stand at $8,392,813 against $5,373,606 the previous year.

Other items in the balance sheet include: Accounts receivable $1,282,530 against $1,590,548; mill supplies, $955,876 against $981.232; merchandise, $235,065 against $203,696; net property, $25,073,602 against $21,599,846; capital stock paid up unchanged at $28,800,000; bills payable $265,883 against $204,100; accounts payable, $1,035,487 against $551.938; and business profits tax, $1,095,918 against $640,000 reported as at June 30, 1920.

George Chahoon, jr., president of the company, in his remarks to shareholders, refers very briefly to the report, and the general situation as regards the company. His remarks in full are:—

"The profits for the year ending June 30, 1921, after setting aside sufficient reserves for taxes, depreciation and depletion, were $4,515,929.

"After the payment of interest and all other charges, and dividends at the rate of six per cent, the surplus for the year was $2,787,929.

"It was thought to be a conservative policy to set aside a reserve of $2,000,000 for possible depreciation of inventories.

"The two new paper machines and other mill changes referred to in the last annual report were completed at the beginning of the present calendar year, and are operating in a satisfactory manner. The product of these machines is entirely contracted for some years to come."

WESTERN ITEMS.

J. D. McArthur, the well-known railway contractor, of Winnipeg, representing the Manitoba Pulp and Paper Company, recently obtained a pulp concession consisting of 718 square miles of pulp and timber lands just to the east of Lake Winnipeg. Mr. McArthur stated that preliminary work on the mill would start immediately and that between 600 and 700 men would be given employment there. Under the conditions laid down the company is to construct a pulp and paper mill costing not less than $1,000,000, to be completed within three years, with a capacity of 100 tons a day. Not less than 50 per cent of the pulp is to be manufactured into paper by the mill. The government has laid down strict rules with regard to the marketing of the mill's product. If in the opinion of the minister of the interior, the domestic market requires it, a ban will be placed upon exports. The company proposes to erect a two-machine mill as a first unit.

From Portland, Oregon, recently came the announcement of the largest sale of pulp timber yet made in the U.S. National forests. The Alaskan-American Paper corporation of New York purchased what is known as the Behm Canal unit which is the Tongass national forest, Alaska, about 60 miles north of Ketchikan. The purchase includes about 100,000,000 cubic feet of spruce, hemlock and cedar. The concern intends to erect pulp mills on its property and applied for the necessary water rights. The price of the timber was 60 cents per 100 cubic feet of spruce and cedar and 30 cents for hemlock and other species.

After five months strenuous work the government officials engaged in the woods of upper Fraser river valley in estimating between 250 and 300 square miles of timber for supplying the Fraser Timber Syndicate have reached Prince George. The Fraser Timber Syndicate plans to erect a pulp and paper plant at Prince George at the cost of several million dollars. Mr. Robert Tryhurst and the principals of the company are expected to visit central B.C. in the near future when definite announcements of the company's plans are expected to be made.

QUEBEC REDUCES STUMPAGE TAXES.

Following serious consideration the Government has temporarily suspended the order-in-council of October 1920, regulating the rights of stumpage, also reducing the royalty fee, the schedule of prices for 1918 being adopted, which is nearly 50 per cent less than that of 1920. It will greatly reduce the revenue of the department of Lands and Forests, but the Government deems it preferable to suffer the loss, and give work to the thousands of wood cutters who are awaiting this decision.

Courage is just strength of heart and the strong heart makes itself felt everywhere, and lifts up the whole of life, and ennobles it, and makes it move directly to its chosen aim.—Rev. Henry Van Dyke, D.D.

UNITED STATES NOTES

Reports from various sections of the country to the American Paper and Pulp Association indicate a gradual improvement in the high-grade paper industry. Among the notable examples of resumptions in plants manufacturing the finer products are the Strathmore Paper Company, at Mittineague, Mass., which restored its machines to production September 1, and the American Writing Paper Company, which is steadily increasing its output. Following the recent and various individual downward revisions in the price of high-grade paper, liquidation is apparently complete in the writing, book and cover paper markets, and as a result buying is increasing.

A large modern manufacturing plant, put up by the Louisiana Celotex Company on the bank of the Mississippi River not far from New Orleans, is about ready for the start of operations. This plant has been built and equipped for the manufacture of an insulating board, bearing the trade name of "Celotex," which is really a "made" lumber converted by a special process from bagasse. Over a half million dollars have been put into the undertaking to date by its promoters. These are all men who have been actively engaged in the fiber and insulating industry for many years. The officers of the company are: B. G. Dahlberg, president; J. K. Shaw, vice-president; C. G. Muench, vice-president; C. F. Dahlberg, treasurer, and T. E. Dahlberg, secretary and assistant to the president.

The International Paper Company, according to Philip T. Dodge, its president, is steadily increasing its output, producing about 400 tons of paper daily. In the not distant future the company expects production to reach the figure prior to the strike. Eight mills are now operating, Mr. Dodge says, and he declares that although the company does not object to organization within the circle of its own employes, it is through with unionism and will insist on an open shop. Men have more money at the end of the year, in Mr. Dodge's opinion, on the open shop basis than they have under the closed shop with strikes and delays.

The paper trade salesmen of the New England district will gather in a conference at the Hotel Copley Plaza, Boston, next Wednesday. This meeting will be given over to a discussion of business conditions and is in line with similar trade discussion meetings being arranged for paper salesmen in all sections of the country.

An action for the recovery of damages put at $63,000 has been instituted in the District Court at Dayton, Ohio, against the American Wood Pulp Corporation of New York by the Miami Paper Company of West Carrollton, Ohio. The plaintiff corporation charges misrepresentation in the sale of sulphite it contracted to buy and it now seeks to recover the price it paid for the material, alleging that a grade of sulphite inferior to that originally specified had been delivered. After using more than 100,000 pounds of the sulphite, the Miami company discovered, it is charged, that it had been duped "through false representation."

A further cut in newsprint for the ensuing three months by the International Paper Company is reported by Dow, Jones & Co., the financial news agency, but not confirmed by the company. The latest reduction will be $15 per ton, bringing the price down to $80 per ton. This is $50 a ton below the peak price of 1920 and is but $4.95 a ton above the price fixed by the Federal Trade Commission under government control.

An industrial community building and clubhouse that promises to be a model of its kind, is being erected at the Parchment plant of the Kalamazoo Vegetable Parchment Company. The proposed structure, in which it is intended to center the social and community activities of the town, is well situated, being immediately adjacent to the playgrounds and directly across the river road from the big paper mill and parchment plant.

Eugene F. Crowe, for years a prominent figure in the paper trade of the Empire State, died recently of heart disease while on a yatching cruise. Mr. Crow was at the head of the Perkins-Goodwin Company of New York at the time of his death. He had worked up to the presidency of this concern after thirty years of faithful and efficient service, having started at the bottom as a paper salesman. He is survived by his widow, Mrs. Grace M. Crow.

The Rex Paper Company, Kalamazoo, Mich., has maintained production at a steady gait since the beginning of the year and can boast a record of having run without a single day's shutdown since Jan. 1. There are at present orders on the company's books for a month's steady business. The business depression that has been felt by every paper mill in the Kalamazoo valley district has missed the Rex plant.

Another company in the valley district that has been doing very well is the Sutherland Paper Company. L. W. Sutherland, its president, has the following to say regarding the outlook as it affects his concern: "I can say honestly that business conditions look better with us than for months. We have had little to complain of the past two or three months and the future outlook is even brighter. I contend we are in a position to know of general conditions, as we supply cartons for so many different lines of manufacture. I predict everybody will be busy next winter and very busy next year. People who think things are going to smash had better take another look at conditions."

Several New York creditors of the Cushnoc and the Kennebec Paper Companies, both of Maine, have decided to conduct the affairs of these concerns, if the co-operation of creditors representing 90 per cent of the companies' indebtedness can be obtained before September 15. Officers for the concerns and creditors representing more than $500,000 of claims already have agreed to the arrangement. Balance sheets of the two companies are said to show a surplus of nearly $1,000, but the business depression prevents the owners from properly financing operations. Under the proposed arrangement, according to the creditors' committee the interests of creditors would be protected and operation of the mills could be continued. Under its terms the creditors would extend the time of payment of claims and accept promissory notes, payable in six months, at 7 per cent interest.

BOOK REVIEW.

Application of Dyestuffs to Textiles, Paper, Leather, and Other Materials. J. MERRITT MATTHEWS, xvi. 768 p. 303 fig. tables, bibliography. John Wiley and Sons, Inc., 1920, $10.

The present volume has been the result of a comprehensive and more extended development of the author's earlier book entitled "Laboratory Manual of Dyeing and Textile Chemistry." It has been greatly broadened in its scope so as to appeal to the interests of all those concerned in the application of dyestuffs. The treatment is a technical one; that is to say, definite facts have been presented in a definite form. The war has created considerable chaos in the dyestuff world and as a result of the tremendous impetus in the manufacture of dyestuffs in America and in England, there has been a great readjustment in the naming of dyestuffs. In order to prevent confusion as well as the risk of recording products that may subsequently prove to be of only a temporary significance, the author has deemed it advisable to retain the names of the dyestuffs that were well known before the war and which would be easily and intelligently recognized in the industry all over the world.

In view of the fact that paper, as regards its properties with respect to dyestuffs, closely resembles cotton and the other vegetable fibres, and that paper may be dyed with basic, acid, substantive, and to a lesser extent some of the sulphur colors as well as some of the vat dyes, the book contains much of interest to the paper manufacturer. The chapters of special importance are, probably: Application of acids dyes to silk, cotton, etc.; basic dyes on cotton; Application of substantive dyes to cotton; Sulphur dyes; The vat dyes; Testing the fastness of colors: Application of dyes to various materials, Testing of dyestuffs.

Matthews, in discussing the dyeing of paper, gives the following details: "Paper may be considered as a web of fabric of interlaced vegetables fibers made by enmeshing them on a screen from a broth or suspension of these fibers in water. Paper may be dyed either in the form of pulp (which consists of a suspension of the fibers in water) previous to being converted into paper or in the form of the prepared paper. In the former case the pulp is contained in a mixing tank or beater and the dyestuff solutions and other necessary ingredients are added directly to the pulp and thoroughly incorporated with it by mixing. The dye is either taken up directly by the fiber or is precipitated in and on the fiber by suitable mordants. In the case of dyeing the prepared paper itself the latter in open width is run through a solution of the dyestuffs, which it takes up either by combination with the fiber or by simple absorption and becomes dyed thereby. In some cases where the paper is heavily coated and dyed on one side only the coloring matter in the form of a proper paste or solution is brushed on the surface of the paper or applied by means of rollers, in which case it is more of a painting operation than a real dyeing one.

"The dyes that are principally used for the coloring of paper are the basic, acid, substantive, and to a lesser extent some of the sulphur colors as well as some of the vat dyes, where the production of colors or tints of great fastness to light is desired.

"Paper pulp is dyed in the beater with the basic dyes in the following manner: There is first added to the pulp in the beater 3 to 4 per cent aluminum sulphate dissolved in water and the beater is allowed to run for ten minutes; then add the solution of the basic dye and allow the beater to run for another ten minutes; next add a solution of 4 per cent of resin soap and run for fifteen minutes, when the back waste water should show clear, indicating that all the dye has been taken up by the pulp. In this method of dying the dyestuff is thrown down by the precipitate of aluminum resin soap incorporated with the fiber pulp. When dyeing colors involving the use of a mixture of several dyes, it is best not to add the mixed dye solution, but to add the several colors in solution separately. The dyestuff solutions as well as the other solutions employed should be rather dilute in order to enhance the uniformity of their distribution as far as possible.

"The acid dyes are applied in the same manner as above described for the basic colors. When mixtures of mechanical and sulphite pulp are used the two fibers often do not come up to the same color with the acid dyes; therefore it is recommended that paper dyed with the acid colors should be topped with basic dyes as these come up evenly on both fibers. The solution of the basic dye should be added after that of the acid color has been properly and thoroughly worked in.

"The substantive and sulphur dyes are also applied in the same manner as the basic dye with the use of aluminum sulphate and rosin soap. Some of the substantive dyes may be applied without the addition of these chemicals but the color is apt to bleed out into water and cause stains. The sulphur dyes must be first dissolved in the necessary quantity of sodium sulphide.

"The dyeing of made up paper (so-called staining) is done almost entirely with the acid and basic dyes. The colors should be well dissolved in water and the solutions filtered. The color solution is brushed on the paper either by hand or by the use of suitable brush machines. Tissue paper is also extensively dyed for use in making paper flowers and other ornamental objects; in this case acid, basic and substantive dyes may be employed and the dyeing is usually done in a dyeing machine in which the paper is run through the concentrated dye solution and then on to hot cylinders for drying. Wall paper and coated paper are usually dyed by an operation similar to that of padding, the strong color solution together with suitable sizing and filling agents being applied to one surface of the paper in a padding machine by means of rollers and then dried. In the dyeing by this method pigment colors may also be used, as well as the coal-tar color-lakes made by precipitating the dyestuff on a metallic base."
—Clarence J. West, National Research Council.

The salesman who gets there first has a tremendous advantage. By getting there first he makes a lasting impression.—The Hoffman Henchman.

The optimist sees a better world through all the smoke; the pessimist only notes the destruction of the flames.—The Electric Bulletin.

He who has conferred a kindness should be silent, he who has received one should speak of it.—Seneca.

You can't take a "short cut" on a straight road. You may take a "short cut" on a crooked road, but not on a straight one. This is the reason why there are no "short cuts" in the plan of salvation.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 3rd Sept. — The evidences of improvement in the general trade situation, which have been noted for the last two weeks, still continue to be manifested, though, up to the present, in a considerably less decided form than is to be desired. Stocks, in the hands of both jobbers and consumers, however, are still being depleted, and replenishment of some sort must set in ere long. Next week will see the end of the Canadian National Exhibition, and it is generally assumed that, if business generally is going to pick up substantially — and as to this opinions are of a conflicting character — unmistakable signs of trade revival will be in evidence. As to the likelihood of a general trade revival on any considerable scale setting in in anything like the near future, the writer, who has made it his business to discuss this question in most quarters which might, prima facie, be expected to be able to form a more or less reasonable forecast, is frankly not oversanguine. The best that we can hope for, in his view, is that conditions generally — what is now being said is not with reference to the pulp and paper industry but to it as part and parcel of the industry of the country at large — will mend gradually from now on until next Spring when a really substantial improvement should get well under way.

The annual statement of the Laurentide Company, which was handed out last night, is being pointed to today as evidence that, during the year ended the 30th June last, for the latter half of which the industry was popularly believed to be "in the doldrums," a concern admittedly exceptionally well administered, could show handsome profits. The company's profits for the year totalled no less than $4,615,828, after allowances for taxes, depreciation and depletion, thus placing it in an excellent position to deal with such writing-off of inventories as may be considered necessary under existing trade conditions and to carry on over the period of more or less slackened business that may lie immediately ahead. After the payment of interest and all other charges and dividends at the rate of six per cent, the surplus for the year was $2,787,928. It was thought to be conservative policy to set aside a reserve of $2,000,000 for possible depreciation of inventories. The Company has no bonded indebtedness or preferred stock, and its loans from the bank are fully covered by income-earning investments.

PULPWOOD.—Under present conditions, there is a manifest resolve to go slow both in the buying and in the cutting of pulpwood. Most of the pulp and paper mills are well supplied with wood. Operations in the woods are not likely to be on a large scale, comparatively speaking, this winter. The number of cutters is to be diminished and the wages paid to them have been reduced to less than half the amount paid last winter, so far as Ontario is concerned. The pulpwood market is exhibiting little briskness for the moment, nor are there many signs of a likely improvement in the near future.

PULP. — The pulp market is distinctly lacking in life. Quiet trade conditions and certain recent occurrences are having a "slowing-up" effect on conditions at many of the mills.

NEWSPRINT. — Several mills continue to be kept very busy. There is notably big production going on at the Laurentide and Abitibi plants. Public interest still centres in the question of the price of newsprint for the last quarter of this year. It seems to be generally assumed in publishing circles that this price will be $80 per ton.

BONDS AND WRITING PAPERS. — Mills report that business in bonds and writing papers showed a welcome improvement last August. A representative of one large mill told the writer that last month was a good deal better than July, and that there was every prospect that this month would witness a substantial improvement over last month's business. This is satisfactory not only in itself but also as an indication that commercial houses, which are the big users of these lines, find that business is picking up.

WRAPPING PAPERS. — The improvement noted in the wrapping paper situation — particularly in its kraft aspect — is still maintained.

NEW YORK MARKETS.

New York, Sept. 3.—(Special Correspondence). — The International Paper Company has announced a reduction of $15 per ton in the price of newsprint paper, bringing the new quotation down to $80 a ton. This information was obtained in a statement published by a local news gathering agency which quotes President Philip T. Dodge of the I.P. as saying the "International Paper Company has fixed the price of newsprint for the last quarter of the current year at 4 cents a pound at the mill. This is a reduction of three-quarters of a cent a pound from the price maintained for the third quarter."

At the offices of the I.P. at 30 Broad street today it was said that Mr. Dodge was away on a vacation and had been gone for several days. At the sales department the reduction was neither confirmed nor denied, it being stated that no information could be made public in the absence of Mr. Dodge or the other officials of the company. There is consequently some question as to whether the reduction in newsprint prices by the I.P. has been officially promulgated, though most members of the trade in New York believe that even though the cut in price has not been officially made that it will be within the next few days.

Obviously the rumors and reports relative to price reductions are having a deterrent influence on business in newsprint. Publishers are holding back in buying excepting when in urgent want of paper, and most publishers are going to their reserve stocks of paper to cover present requirements rather than place orders pending a stabilization of quotations. Some low prices are mentioned in connection with spot sales of newsprint, it being said that standard news in rolls is being bought down to 4 cents a pound and lower from second hands, who evidently are liquidating stocks at reduced prices before the new scale of contract prices becomes



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effective. From all indications, consumption of print paper continues at a good rate. New York newspapers are printing their usual size editions, and appear to be carrying more advertising than in some time, indicating that advertising is increasing.

The remainder of the paper market shows little change. Business is of moderate volume and prices in a majority of cases hold steady. Demand for book papers seems to have improved to some extent, and quotations are stiffening, it being quite apparent that those monufacturers who a short while ago were accepting orders at rather sharp concessions from the prices quoted are now more or less firm in their insistence on full asked figures. Machine finished book is quoted at a minimum of 6 cents per pound f.o.b. New York and most mills want a quarter to a half cent above this price. Wrappings rule steady in price at a basis of 5.50 to 6 cents per pound on No. 1 domestic kraft and are reported moving in fairly good tonnage. Tissues continue active. Mills making fine tissues are steadily increasing their production as more orders are received, while coarse tissue mills are busily engaged and are experiencing little difficulty in finding an outlet for the great bulk of their present output.

An encouraging development is the improved demand for fine papers. Both consumers and jobbers are buying larger quantities of writing and bond papers than in some months, and members of the trade see in this a more accurate sign of general business improvement than in any occurrence in the paper market in a long time. Moreover, it is viewed as an apt criterion of betfer conditions to come in the paper industry and serves to buoy up trade sentiment to no small extent.

Box boards are moving in comparatively good amounts and at steadying quotations. Cost mills in the eastern part of the country are quoting $30 a ton f.o.b. New Yor kon plain chip board at present, and while an occasional sale at a little below this level is reported, most of the chip board sold now is bringing at least this figure. News board is quoted at from $32.50 a ton upward and is also enjoying a fairly good demand. This is the season when activity in the paper box industry invariably expands and board manufacturers and dealers look for a consistent broadening of demand for boards.

GROUND WOOD.—Firmness continues to be the salient characteristic of the mechanical wood pulp market. There is a steady demand for supplies and buyers are meeting the prices asked without much reluctance, indicating that they are in need of pulp and that they have faith in the stability of prices. Reports of low water at various grinding plants, necessitating further reduction in grinding operations, continue to come in, and everyone on the selling end of the trade freely expresses the belief that if present conditions keep up, a shortage of ground wood will certainly develop. The drought in all parts of the country is authoritatively said to be more severe this summer than in many years and some pulp mills are so badly affected that they have been obliged to close down entirely. Production is at a low point, and it is declared that only the existence of surplus stocks has prevented prices from sharply rising. Between $28 and $30 a ton f.o.b. grinding mills continues to be the average range of quotations, with a majority of manufacturers asking the higher figure. So firm are prices that in frequent instances stored ground wood is fetching the same figures as is freshly ground pulp.

CHEMICAL PULP.—There are two major factors making for a stronger situation in foreign wood pulp. One is that fairly heavy buying by paper manufacturers recently has removed most of the supply of imported pulp on the spot in the country, thus doing away with much of the price-cutting by importers on spot holdings. The other is that the United States Government, through the Treasury Department in Washington, is investigating charges that Swedish and German producers are dumping sulphite and kraft pulp into this country in violation of the provisions of the Emergency Tariff act. This Government inquiry has reached a stage where several import firms have been required to put up bonds on certain lots of foreign pulp lately landed here until it is proven that European manufacturers are not selling pulp in the United States at lower prices than are being obtained elsewhere. This obviously is causing importers to proceed more cautiously in bringing pulp into the country and is making for firmer prices. Kraft pulp, which only a few days ago was selling at 2 to 2.15 cents a pound ex the dock, is now reported held for a minimum of 2.25 cents, with some sales reported at 2.40 cents. Foreign unbleached sulphite is quoted at 2.50 to 2.75 cents, and bleached sulphite at 3.75 to 4 cents. These latter prices denote no change but it is significant that importers are generally asking close to the upper edge of quoted ranges.

There is little improvement in the domestic pulp situation and but little trade activity in this branch of the market. Buying interest continues to be centered on foreign pulps and most of the supply being absorbed by consumers consists of imported pulp, which is still available at lower prices than domestic producers quote.

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RAGS.—The papermaking rag market is quiet and lacking in feature. Current buying is very spasmodic and at best totals but a light volume of goods, paper mills with few exceptions showing little interest in rag stock. Prices are uncertain and they depend in large measure on the circumstances attending each individual transaction. Some dealers are letting go of rags at whatever can be realized in the way of price, others are firmer in their views and are not attempting to market stock at prevailing quotations. Just as an example, dealers in New England are reported selling repacked thirds and blues to paper mills in that section at 1.75 cents a pound delivered, whereas Middle West dealers are said to be holding for 2.75 cents and higher for the same kind of rags. Roofing rags are moving in a fairly steady manner though in small quantities at an approximate price basis of around 70 cents per hundred pounds for No. 2 satinets.

PAPER STOCK.—Most descriptions of waste paper are moving in comparatively good amounts and the general trend of prices is upward. Dealers place much stress on the growing scarcity of old paper and assert that collectors are still refusing to gather usual amounts notwithstanding that prices have improved considerably during the past several weeks, it being contended that there is little room for profit even at the advanced figures. Old magazines are a very firm item and sellers are demanding at least 95 cents a hundred pounds at shipping points for No. 1 heavy books and magazines, while soft white shavings are firm at 2.35 cents a pound, hard whites at 3 cents, old No. 1 kraft at 1.65 cents, and white blank news cuttings at 1.50 cents. Folded newspapers have strengthened further in price with most dealers in New York now asking at least 45 cents per hundred f.o.b. this city, and No. 1 mixed paper is quoted at 32½ to 35 cents per hundred pounds.

OLD ROPE AND BAGGING.—Old manila rope is quotably firm at around 4 cents per pound at shipping points and is moving in a fairly consistent way. Old bagging continues dull and mainly nominal in value.

A BULLETIN ON BARKING DRUMS.

The Canadian Ingersoll-Rand Company, Ltd., has just issued a 20 page bulletin descriptive of the Paulson pulp wood barking and washing drums. This new bulletin which is that numbered P. M. 110 A. is of the same excellent standard of workmanship which called forth our admiration a few weeks ago when we described their chip screens bulletin. There is a short history of the barking drum together with complete descriptions with detailed illustrations of machine parts and drums in process of erection, drums in operation and blue-print lay-outs of barking drum plants. Altogether it is a piece of printing which not only does credit to our Canadian presses but will be a very handsome and helpful addition to the working library of any superintendent or mill manager.

WHAT BELGIUM SUPPLIES TO CANADA.

It may be of interest to look at some of the detailed figures of Belgian exports to Canada in the past year. In the Dominion's returns the first mention of Belgium is under the headings of florists' stock and vegetables, n.op., jute and hemp yarn, linen thread, artificial silk, Bibles and religious tracts, vegetable parchment paper, wrapping paper, and cream separators. Under the headings of plate glass, and common window glass, we find that Belgium supplied the largest share of the Dominion's imports, not a surprising fact, since glass is perhaps Belgium's strongest line in international competition. The imports of Belgian glass of all kinds account for rather more than half the value of the Dominion's total imports from Belgium in 1921, (fiscal year ending June) and show a very great increase as compared with the corresponding imports in 1920. Unset diamonds from Belgium account for $314,915 in 1921, against $16,833 in 1920. A comparatively small quantity of ultra-marine blue was imported from Belgium, but the imports last year were more than double in quantity those from Belgium in 1920. A large quantity of saltpetre came from Belgium in 1920, but under this heading there is a nil return for 1921. The only other headings under which Belgium is mentioned as a source of supplies to Canada last year are "baskets of all kinds, n.o.p." and "lace".—Canadian Export Pioneer.

NOW HORTON STEEL WORKS, LIMITED.

The Canadian Chicago Bridge and Iron Company, Limited, of Bridgeburg, Ontario, and Montreal, Quebec, has changed its corporate name to Horton Steel Works, Limited, according to an announcement made by C. H. Scheman, general manager of the company. The new name has been selected in honor of the late Horace E. Horton, who founded the organiaztion in the United States in 1865. The Canadian organization was first incorporated in 1913 and the plant at Bridgeburg, Ontario, was constructed in that year.

The Corporation has supplied railroads and many industrial organizations of Canada with plate metal products. The company has a tried organization with its own operating officials, a complete plant, erection forces and contracting organization. In addition to Mr. Scheman, Mr. G. S. Sangdahl is district sales manager at Montreal, Mr. C. C. Gregory is manager of plant, and Mr. F. E. Gregory superintendent of erection. The main office and works are at Bridgeburg, Ont.

LEADING CONCERN IN ITS SPECIAL LINE.

It will readily be recognized and admitted that in all lines of business and commercial pursuit there are to be found firms and corporations which attain prominence and distinction in specialized lines of trade because of the high quality if the goods which they handle, the progressive methods which they employ and the careful attention which they give to the advancement of the best interests and welfare of their patrons and customers. Concerns of this character exert an important influence in developing and promoting the general business and commercial resources of the community at large, and hence become factors adding steadily to its material wealth and prosperity.

The Elixman Paper Core Co., Inc., Corinth, N.Y., widely known manufacturers of compressed paper cores and steel caps for protecting ends, is a concern which has built up a large and important business in Canada and United States and acquired a deservedly high trade standing and prestige because of the excellence and reability of its workmanship and service along this specialized line of applied effort and endeavor.

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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., September 15th, 1921. No. 37

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

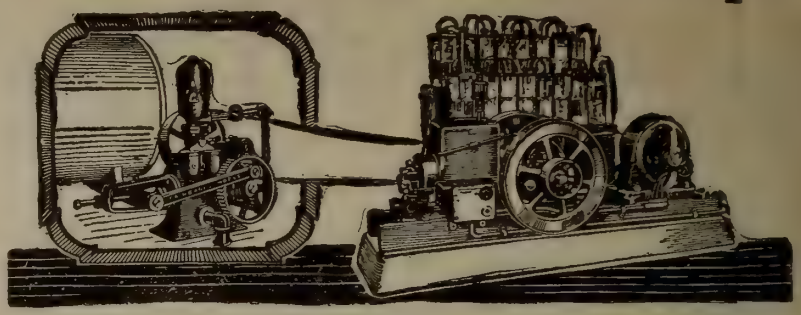
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EDITORIAL

ENCOURAGING EDUCATION.

The secretary of the Canadian Pulp and Paper Association assisted by members of the Committee of Education, has prepared for distribution a four page advertising letter, the contents of which are reproduced elsewhere in this issue. This has been sent to members of the Technical Section and the management of the Canadian mills. It is being sent also to others interested. Results already obtained, indicate that the Text Books on the Manufacture of Pulp and Paper which are being prepared at the instance of the industry by the best qualified experts on the various phases thereof, will meet with unusual success. Not only are the orders coming in in gratifying volume, but letters from a number of large concerns show that the management are taking a deep interest in the distribution of the books among their employees. One case in particular is worthy of special mention. The Provincial Pulp and Paper Mills, operating three paper mills and a sulphite pulp mill in Ontario, have taken a keen interest in their matter, as they have also in safety work and such activities. This company, in order to encourage reading and study on the part of their employees, have very generously offered to advance the first payment for the purchase of the first two volumes which are now ready, with the understanding that this money be paid back at the rate of $5.00 monthly. Very likely other concerns will follow a somewhat similar plan.

Several enquiries have been received asking advice with regard to the use of the books in night classes. every proposition of this kind is an individual problem for the mill interested but there are underlying principles common to every mill and it was largely this fact which decided the committee on including an authoritative text on the fundamental subjects of mathematics and elementary science which must be familiar to the student who would understand and appreciate the discussion of technical principles and processes. The first two volumes, which include Arithmetic, Mathematical Applications, Reading Working Drawings, Elementary Physics, Mechanics and Hydraulics, Elementary Electricity, and Elementary Chemistry, are ready for immediate distribution both in bound volumes and, to those who have ordered the set of the books, in the convenient form of separate sections in one or more pamphlets. The material is thus at hand for the immediate organization of classes in the elementary subjects.

In answer to numerous enquiries as to the progress being made in the other volumes, the following summary will doubtless be of interest. In volume 3 the manuscript on the Properties of Pulpwoods has been prepared by the authors and should be in the hands of the editor this week. The manuscript on Wood Preparing is ready for the printer. The manuscript on Mechanical Pulp is still in the author's hands but practically complete. The manuscript on Sulphite Pulp is being prepared for the printer. That on SoSda Pulp is in the hands of the printer and that on Sulphate Pulp is ready for printing. The same is true of the manuscripts on Bleaching of Pulp, Testing of Pulp and Refining of Pulp. The section on the Treatment of Pulp is now on the press. The finished volumes may therefore be expected as soon as the press and book-binding work can be accomplished at a time when labor conditions in the printing industry are somewhat unsettled.

In Volume 4 the original manuscript has been received for every section except that on the Treatment of Waste Papers. Two of these sections have been edited and several others have been carefully examined and criticized by experts in the industry in order to assist the author and, with more or less revision, will soon be made ready for printing.

Volume 5 is necessarily a little slower in development because the preparation of several sections depends upon the method of treatment of certain subjects proceeding them. Three of the sections, however, have been finished by the authors and considerable material is on hand for several of the others.

It will be of interest to remark that several requests have been received for the privilege of translating into other languages and this matter is now under consideration by the committee.

Since more than 100 prominent men engaged in the industry have cooperated in the preparation of these books, it is safe to state that they will fill an important and unusual place in the technical literature of our day, both for completeness of treatment and authenticity of information.

BRITISH CHEMISTS SURPRIZED.

Canada can well be proud of the advances made by her chemical industries, in the opinion of the prominent chemists from England and the United States who visited the chemical manufacturing centers of Quebec and Ontario. Among the industries visited, they spent some time in pulp and paper mills and saw concrete evidence of the application of scientific investigation and control to the production of one of Canada's principal articles of export.

What has been accomplished, is, however, but an indication of greater things that can be done. The application of science to our industry, deliberately, persistently, intelligently, and generously, will be the greatest

factor in its future success and development. This applies not only to science in the mill, but, perhaps even more pointedly, to the production and conservation of raw materials. Instead of trying to see how fast we can turn our wood into paper, we must now endeavor to see how long we can make it last. That means applying forestry to the forest and science to the mill, so as to get the greatest possible yield. No science will contribute more to this end than Chemistry.

COBWEBS.

The last issue of Brompton News contains a very interesting article on the Royal Paper Mills Co., the ancestor of the Brompton Pulp and Paper Co. In 1898 the mill was making book and writing paper at the rate 15 tons per day. The chemical pulp mill had a similar capacity. The paper mill now has a daily production of 120 tons of newsprint, 60 tons of kraft and 55 tons of board.

A despatch from Fort William, quoted recently in the Pulp and Paper Magazine, was incorrect. No pulp has been, or is being, shipped from there to the Laurentide Co. But satisfactory shipments are going by boat to Michigan mills.

The three articles by John S. Bates, on the use of decayed wood and prevention of decay in pulp will be reprinted in pamphlet form.

In ordinary times, the American imports of European newsprint would not cause a flicker in Canada. Just now, however, there is a bit of anxiety, probably not so much as affecting profits as affecting production and employment.

A report states that the United States cuts 40 million board feet of lumber and waste 70 million feet in doing so.

Canada spends on the forests about 1¾ cents per acre, U. S. A. 3 cents, Sweden 14 cents and France $1.04.

INSURE YOUR OWN JOB.

Necessary readjustment will mean decreasing the working force in certain industries. Manufacturing plants must cut down production costs and increase efficiency. Most of them now are going over their payrolls and listing the employes who can be most easily spared.

If you want to insure your job do not allow your name to get on this list. By doing more and better work you will make yourself indispensable and your job will be safe.

You know that in your own office or shop there are certain men and women who will not be laid off under any circumstances. They are those who do the most work in the shortest time. They are sure of their places as long as the establishment continues in business. If it should shut down altogether they could get jobs elsewhere. People like that are always in demand.

This is a good time to put yourself in this class. Be so competent that your name will never be mentioned when the bosses talk over plans for shortening the force.

If the same work can be done with fewer employes in the future working forces are sure to be reduced. In some instances it has been proved that this can be done.

A big automobie manufacturing plant in Detroit, finding that the demand for its cars had decreased, reduced its working force twenty per cent. To the surprise of the managers there was but little decrease in production. Continued lessening of demand led to a further cut in the force of twenty per cent. And the men who remained on the job worked so much harder that the production per man was increased eleven per cent.

Those men who are still at work will keep their jobs, and the plant will not shut down.

Remember that when the boss of a plant makes up a list of the men to lay off he begins with the least efficient. It is the laggards and the ne'er-do-wells and the men whose interest in the job is confined solely to the payroll who go first.

After that, if a big reduction is to be made, the men whose output for one reason or another is the smallest are scheduled for vacations.

But the really valuable men, who have become a part of the business, and who are ambitious to rise in it, are the ones who are always kept.

However much unemployment there may be as the result of the coming readjustment, it will not affect you if you are among the competent workers. Times are never so hard that efficient men cannot get employment.

The thing to do just now is to keep your mind on your work and to do it better than you ever did before. That will insure your job, and a little extra work is all the premium you will have to pay for the insurance.—Daily News, New York.

KRAFT PAPER IN BETTER DEMAND.

Reports which have been appearing frequently of late to the effect that an increase was developing in the demand for "kraft" paper seem to have taken definite shape in a decidedly brighter outlook for that branch of the paper industry.

Representatives of mills manufacturing that grade of paper have been reluctant heretofore to make any prophecy as to future business on the strength of the more brisk demand which has recently been noted, but a canvass of the situation by a Montreal paper revealed the fact that there is a strongly founded feeling that the improvement is permanent, and that the near future will see still further betterment.

The movement is supposedly based upon the gradual improvement of business lines in the United States which use large quantities of kraft paper. These lines were caught with large supplies of paper on hand when the sump came early in 1920. It is reported on good authority that these supplies are about exhausted, and that orders are coming in in increasing volume for new stock. While there has as yet been no change in prices, it was stated that they would undoubtedly be higher in October if the present improvement is maintained.

The foregoing situation, if correct, will react favorably upon the position of several Canadian companies which are large manufacturers of kraft paper.

The Pro's and Con's of the Long List

There is considerable agitation and argument, particularly in the United States, with regard to what is is called "the long price list" for papers. It is a matter of general interest, as it affects several channels whereby the product of the pulp and paper industries reaches the ultimate consumer. Every reader will have, or should have, his own opinion on the subject. This article is to show what some others people think. It should be noted that both of the papers here reproduced are the arguments of American jobbers and printers; conditions are not exactly parallel in Canada, so we cannot apply them directly to the industry up here.—Ed.

THE LONG PRICE LIST FOR PAPER.*

By ROBERT J. HAUSAUER,
President, Buffalo Typothetae.

Let us make clear our understanding of a Long Price List for Paper. It is a method of listing the price of paper at a percentage above the price at which the seller is willing to dispose of that paper to a favored class.

It is the purpose of this discussion to establish that the printer is entitled to favored classification because of the service he performs in the merchandising of paper; that he earns the right to buy cheaper than can the consumer.

Others in Special Class.

Lithographers, bookbinders and stationers have, it seems to me, a similar right to favored classification, and nothing herein is to be construed as suggesting partiality toward the printer as against any other class that can qualify for favored classification under the same principles of service rendered in distribution.

Merchandising is accomplished in various ways. Sometimes the manufacturer undertakes the distribution of his wares directly to the consumer; sometimes the manufacturer distributes through retailers; and sometimes the services of a wholesaler are requisitioned in order to perfect the chain of economical and satisfactory distribution. In almost every case, the functions of the manufacturer, the wholesaler and the retailer are clearly defined — each assumes specific obligations, and the right of each to a legitimate profit above costs is quite generally recognized by the other parties to the scheme of distribution. Thus where all three agencies, the manufacturer, the wholesaler and the retailer are parties to the distribution of a commodity, the manufacturer will not sell to the retailer at the same price as he sells to the wholesaler; and the wholesaler, in turn, will not sell to the consumer at the same price as he sells to the retailer.

I have personally investigated the practice in each of the following lines of industries: Meat, groceries, dry goods, drugs, shoes, clothing, lumber, brick, plumbing supplies, electrical supplies, wall paper, hardware, furniture, paint, cement.

These industries were investigated because they occurred to me as being typical and entering vitally into the need of the public. The list is probably not exhaustive, but is sufficiently long to establish the fact that the principle for which we are contending is quite generally recognized. There was not a single industry investigated by me in which the services rendered by the wholesaler were not recognized by a positive refusal to sell to the retailer at prices as low as those quoted the wholesaler, nor one in which the services of retailer were not recognized by wholesaler in any quotations to consumers.

Having thus clearly established that in other industries it is the practice to recognize tangibly those classes who perform a service in the merchandising of commodities, in order to substantiate our claim to similar recognition, it remains only to prove that printers perform such service in the merchandising of paper.

It is well at this point to have it clearly understood that paper as spoken of in this discussion refers only to so-called fine papers — book papers, coated papers, writing, cover papers and cardboards—and has nothing to do with wrapping paper and so-called coarse papers such as usually find their outlet to the ultimate consumer through other agencies than the printer.

Printer Assists in Distribution.

I am going to point out in detail the extent to which printers enter into and assist in solving the problem of the distribution of paper.

1. Our numerous plants, serving as they do widely separated communities, engaged as they are in specializing in various kinds of printing, are convenient agencies through which to merchandise paper.

2. The personalities of printers and printers' salesmen are important factors in the distribution of paper. While it is true that printers are interested principally in selling printing, paper is the only tangible thing about which the average purchaser of printing can express an intelligent opinion. When buying printing, the purchaser buys everything, except paper, before it is finished. Therefore, much of the effort and time expended in effecting a sale of printing is devoted to satisfying the purchaser about paper.

Printer Forms Contact Point.

3. Printers and their salesmen form the point of contact between the mill and the wholesaler, on the one hand, and the ultimate consumer, on the other. Indeed, it has been admitted that as much as 95 per cent of the fine papers manufactured reaches the ultimate consumer through such agencies as the printer, lithographer and publisher.

4. Printers assume the obligation of correctly estimating the quantity of paper required to produce the job in question, and accept the consequences of error.

5. Printers assume the obligation of specifying the kind of paper best calculated to produce the desired effect with the greatest economy to the customer, and accept the consequences attending faulty judgment.

6. Printers purchase paper under trade customs designed to fit the convenience of the wholesaler of paper, and sell paper under conditions imposed largely by the needs of the consumer, absorbing any losses which arise through differences in the conditions under which they buy and those which they sell. Thus, if a customer having a mailing list of exactly fifty thousand orders, exactly fifty thousand pieces, and we buy a special size of paper for use on that order, we may be compelled to accept an overrun or underrun of from 3 to 15 per cent, in the first instance, paying for paper we cannot use on that order, and, in the second instance, making up the shortage as best we can, usually at increased expense.

* An address delivered at the Second District Typothetae Convention.

Must Conciliate Consumer.

The printer has to conciliate the ultimate consumer of paper for variations in weight and shade, accept responsibility for defects which cannot be detected before paper is cut, adapt his printing processes to overcome defects in the paper and do countless other things imposed by the wholesaler and to most of which the consumer cannot and will not adapt himself.

7. The printer actually purchases the paper and assumes responsibility for shortage resulting from faulty delivery or mishaps in printing.

8. The printer stores paper until it can be printed and the capital required to carry paper in the form of unfinished work is an important factor in the merchandising of paper.

9. The printer insures paper against loss through fire until it is printed and delivered.

10. The printer subjects himself to costs in the physical handling and counting of paper, in the storage space he is compelled to maintain, in the tools and labor necessary to handle it.

11. The printer effects actual delivery of paper to the consumer.

12. The printer purchases his paper according to the terms of the wholesaler, and accepts his pay according to the terms usual in retailing.

13. The printer sustains his normal percentage of loss in the collection of that portion of his accounts represented by the value of the paper used.

14. The printer assumes the cost of recording, invoicing and collecting for the paper used by his customers.

I submit, gentlemen, that in the performance of these duties the printer accepts very definite responsibilities in the distribution of paper and performs all the functions of a retailer.

The Printer Serves the Paper Merchant.

Imagine, if you can, a system by which the wholesaler sold all paper direct to the consumer, had it delivered to a printer, assumed all responsibility for shortage and spoilage from any cause, insured the paper, called for it and delivered it in printed form, invoiced it and collected for it. How much do you think the paper jobber would find it necessary to add to his selling price to compensate him for the additional services?

Assuming that you agree with me that the printer is the retailer of paper, that he accepts definite responsibilities, incurs expense and performs necessary services in the distribution of paper, the cost of which, unless borne by the printer, must of necessity be added to the price of paper, consider, please, the proper answer to these questions. Is it fair to permit any consumer to purchase his paper at the same price as is charged the printer, in order that the consumer may be saved the cost of the services rendered by the printer and a fair merchandising profit on the paper used?

What other purpose can a consumer have in mind who attempts to buy his paper from a wholesaler than to escape paying such cost and profit?

I do not want to be misunderstood as implying that the paper wholesaler does not enact a very necessary part in the distribution of paper. I believe quite the contrary to be the case. His capital, his warehousing facilities, his knowledge of where papers are made and where they can be procured, the work of his organization in keeping printers informed as to new lines and changes in existing lines, his ability to carry stocks sufficient to meet average requirements, are all necessary and important factors in the satisfactory and economical distribution of paper.

But I want him to respect our position. He enjoys just the privileges of recognition from the mills that we ask of him.

The point is, that in order to get paper from the manufacturer to the ultimate consumer, certain costs are created and certain services must be rendered. All these costs should be repaid in the ultimate price at which paper is sold and there should also be a profit upon services rendered by all agents to a satisfactory and economical distribution. The wholesaler's cost and profit are protected by the sales policy of the mills, and we want the wholesaler to protect our costs.

Why the Long Price List?

Having convinced ourselves as I hope we have by this time, of the propriety of our contentions and having, theoretically at least, scolded the wholesaler of paper into some semblance of acquiescence, let us proceed to our reasons for believing that the Long Price List will be the most effective way to accomplish the ends sought.

There are two ways in which the desire of the consumer to purchase paper at wholesale prices can be checked. First, by the wholesaler flatly declining to sell him at any price, and, second by the wholesaler selling him only at a price sufficiently in advance of the price quoted to the printers to cover the costs which would normally accrue to the printer plus a fair profit for the services the latter will render.

Doubtless, the simplest plan would be for the wholesaler to decline absolutely to sell to the consumer, and if that plan could be generally adopted, I would consider that the wholesalers had done their whole duty to the printer. But I, for one, would ask of the wholesaler something more than his duty. We want his sympathetic co-operation in remedying a condition which exists, I admit largely through a lack of gumption in the printer. I do not regard it as probable that the wholesaler will continue to sell much paper direct to the consumers at an advance in price to cover the printer's cost and profits.

Business-like printers would immediately add their handling costs and profits to paper even though it were furnished by the consumer, and the results would be two profits to be paid on the same transaction, a condition which the consumer would very soon understand and avoid by letting the printer purchase all paper. I believe that either method would very soon amount to the same thing, except that the wholesaler issuing a Long Price List would still be privileged to sell such fine papers as were not intended for printing, a class of business he is better qualified to handle than the printer, and which possibly may be attractive to him.

Many Have Not Learned Why They Joined.

It is the psychology of the Long Price List as it affects the efforts being put forth by the United Typothetae of America to educate printers to get a just profit that appeals to me. While the United Typothetae of America is increasing its membership at a tremendous rate and is educating most of its members and many ouside of its membership to a better conception of what constitutes profit, there are still many more printers outside the Typothetae than there are in it, and, I am sorry to say, there are many within the Typothetae who have not yet found out why they joined. These printers need help, and with the return of more competitive conditions will need still more help if the burden of their accumulated failures is not to be borne by the printers who do make profit. These benighted printers are add-

ing from just nothing to almost anything to the cost of paper to care for stock handling and profit, and are to an appreciable extent preventing sales by printers whose prices take care of such contingencies.

Printers Will Recognize Sincerity.

I firmly believe that printers will be convinced of the sincerity of effort toward co-operation which would be manifested by a statement from the wholesalers that the Long Price List is a voluntary contribution from them to the printers in order that the latter may safely charge list prices to their customers without fear of the customer being able to purchase paper direct from the wholesaler at a cheaper price.

I believe that the amount by which the paper jobber advances his list above what he charges the printer will come to be accepted profit and handling cost due the printer, that through the education which the paper jobber and his salesmen could spread as to the proper use of a Long Price List plus the efforts of the United Typothetae of America in the same direction, a custom of charging for stock handling and profit can be made to prevail in our industry. Of course, there will always be those who cheat themselves, but the net results will be that all printers will be adding something to the cost of paper instead of nothing, and the goal for which we can all strive is that ultimately they will add their cost and a proper profit.

Protect Retailers Profit.

A further consideration that causes me to favor the Long Price List is that it places upon the wholesaler the burden of insisting that the consumer of paper pay a retailer's cost and profit. Under the existence of sales policy, should a sale be made to the consumer and the question arise between that consumer and his printer as to whether or not the printer intends charging a handling cost and profit, the printer must either lie or risk antagonizing the customer. While there are many printers who can and do courageously contend for the principle of the addition of stock handling costs and profit to every sale of paper made by them, there are many who have not the requisite courage to do this and who actually print paper furnished them without adding sufficient to cover even handling costs. Were such printers as these alone to be considered, we might perhaps look at the matter philosophically in the knowledge that such printers are themselves the greatest sufferers, but unfortunately, every job taken at too low a price and every business failure reacts so unfavorably on the whole industry that the business of the weakest must be made the business of the strongest, and anything that will uplift the industry can not safely be neglected.

As to the precise form of Long Price List to be adopted, there are many widely differing opinions. I can only suggest that which appeals to me. I believe that a price list uniformly advanced 25 per cent above net selling price to printers with a discount of 20 per cent to printers is best. Such a Long Price List is not complicated, is easy for the paper jobber to invoice under, easy for the printer to determine the net price by simply multiplying by 8 and pointing off one place.

A printer's normal stock handling cost is approximately 10 per cent of the cost of paper. Every dollar's worth of paper handled costs $1.10, and if sold at $1.25 leaves a profit of about 9 per cent. Surely this is a sufficiently modest profit.

I advocate asking for the adoption of a sales policy on the part of the paper wholesaler who seeks to sell direct to the consumer, which will commit him to give to the printer who actually prints the stock, and upon the demand of the printer, a credit on his account or a rebate in cash of the amount of the difference between the net and list price on each such sale, provided this is legal.

Some such policy as this is necessary in order to make the Long Price List convincing. The intention of the Long Price List is not to legitimatize the sale of paper direct to the consumer even at an advanced price; it is primarily to protect the printer's costs and profits. Since the wholesaler will have sold this paper at more than sufficient profit, he can have no financial reason for declining to return the profit to the printer who earns it. Without such sales policy as that suggested, there may well be suspicion as to whether the wholesalers have kept faith in maintaining the Long Price List, which could not be allayed except by examination of their books, a procedure both impracticable and distasteful alike to printer and wholesaler.

Ready to Co-operate.

It seems obvious that if we ask for the extent of co-operation involved by the adoption of the suggestions made herein, that we should be prepared to offer our hearty co-operation in return. We surely ought to patronize those who co-operate with us whenever prices are equal or nearly so, and whenever paper suitable for our requirements can be obtained.

A logical adherence to the principles upon which I contend the Long Price List should be granted, would seem to exclude from favored classification the private plant and the publisher, but I believe that you will find that such exclusion would be injudicious and probably not quite fair.

In conclusion I want to say that the Long Price List is not a panacea for our troubles. Compared with cost keeping, correct accounting, proper administration, creative selling and the study of production and emergency, it is an insignificant item in the activities that should engage our attention. But such as it is, I believe it to be a step forward in the right direction.

TEN REASONS FOR A LONG PRICE LIST ON PAPER.

(Anonymous Printer.)

1.—It helps the printer in carrying out his logical function as the one legitimate retail salesman of paper.

2.—It does more than any other single thing toward eliminating the direct sale of paper to the consumer.

3.—It teaches the printer to think of paper in terms of selling price instead of cost, and thereby causes him to automatically transmit these terms to his customer.

4.—It removes the paper dealer from competition with his own biggest customer, the printer.

5.—It gives the printer his profit even when paper is sold by the paper house direct to the consumer.

6.—It is a powerful educational factor for the consumer as it teaches him proper paper stock values as represented in the completed job.

7.—It makes the charging of a proper profit, the line of least resistance, to the printer and strengthens his selling morale.

8.—It reduces economic waste in paper distribution by making possible the issuance of new discount sheets covering market changes, thereby obviating the necessity for issuing entire new catalogs and price lists.

9.—It assures the printer of getting a legitimate profit on the paper stock used in his product.

10.—It is the logical method of pricing merchandise for re-sale and has proved its stabilizing effect in other lines of trade through many years of actual operation.

"WHY-NOTS" OF THE PRICE LIST

As Presented by the National Paper Trade Association of the United States.

During the past thirty years, and particularly the last decade, the question of a Net vs. Long Price List has received more than a fair share of attention and consideration by the Paper and Printing Trades. It has been so thoroughly studied and restudied, considered and reconsidered, that the subject would seem to be almost void of further thrills.

A movement now appears under way to force the issuance of Long Price Lists by the paper merchants of the United States, and as the National Paper Trade Association has by formal resolution declared itself as opposed to such method of pricing, it is deemed wise to present the grounds for such action, and at the same time declare and define the reasons for the insistent and persistent objections of the paper merchants to this plan of pricing paper merchandise.

Before plunging into the real issues of this controversy, it will be well briefly to define the status and function of the two important factors,—Paper Merchant and Printer.

The general paper merchant cannot be described as a wholesaler and the description left there, as is the case in so any other lines of trade. He sells many kinds of merchandise through various channels for all sorts of purposes. It is not as if all papers were handled by one agency, as, for instance, the printer. There are wrapping papers, building papers, fancy papers, artists' and photographic papers, school supplies and many others. The paper merchant must accommodate himself to this complex role and establish and equip himself to serve all the different interests depending upon him. Whatever the general paper merchant is, he is ALL there is in that division of paper distribution. If he is a wholesaler, there is no retailer, and if he is a retailer, there is no wholesaler. It must be recognized, then, that in this dual capacity certain responsibilities and obligations rest upon the merchant that cannot be denied or easily shifted without working injury in some direction.

The commercial printer is not a paper merchant—either wholesaler or retailer—any more than he is an ink merchant. He does not stock and sell paper and paper products in original form. He is a manufacturer or, even more properly, a converter. He takes paper and other materials and puts them through various processes and turns out a finished job of printing in its many forms.

The printer who favors a Long Price List will say, "I care nothing about any papers you sell except those employed in printing. Give me a Long Price List covering those, and I shall be satisfied." This seems reasonable enough but it is not practical or economical for the merchant to issue several price lists covering different classifications of paper. Many papers used in printing go into channels and are used for purposes having no connection whatever with printing, and in those avenues of trade the paper merchant meets competition from tradesmen whose least worry is a Long Price List.

Printers advocating the Long Price List are seeking two objects:

First—The elimination of all direct selling by paper merchant to consumer.

Secaond—The insurance of a proper profit to the printer on all paper he handles.

The paper merchants contend that these two questions must be handled separately because they are influenced by many varying factors. The United Typothetae of America, by coupling the two questions, is ignoring certain fundamental coinsiderations which are vital to the interests of the paper merchant.

Let us first consider the big question of direct selling to the consumer. Conditions in the Paper Industry are and always have been such as to make it impossible or, at least, impractical for the paper merchant to refuse to sell certain consumers of printing papers who elect to make direct purchases of their supplies. Paper mills, with their own distributing equipment, as well as brokers and commission men, continually are soliciting this kind of business and no change in method of pricing will divert these purchases to the printer. Experience proves that the mere declaration by a large and regular buyer of printing that he is determined to buy his paper direct usually is sufficient to secure the acquiescence of the printer; the latter bows to the will and desire of his customer and prints the paper, regardless of the person by whom or the price at which it is sold.

These large direct buyers are limited, it is true, but in number and tonnage involved they are consequential factors, particularly in the large metropolitan markets.

A careful study of this whole question of direct selling leads to the conclusion that, with the elimination of certain large business, which both paper merchant and printer must admit they cannot control, the question resolves itself into one of protection business that can be controlled. No one appreciates better than the paper merchant how closely his interests and welfare are bound up with those of the commercial printer. Everything must be done to safeguard these interests, and it is gratifying to know that, in markets where these perplexing questions have been considered and discussed from this standpoint of mutual interest, a very satisfactory situation has been brought about.

It is conceded by every fair-mided person that the ordinary buyer of printing should not be permitted to buy his paper direct and have it sent to the printer any more than he should buy his ink or plates or any other component part of the finished job. If the printers, in collaboration with the paper merchants, would direct their efforts and organization work properly to defining and restricting such business, something really helpful and constructive would result.

Now, let us consider the second question—i. e., that of proper profit to the printer on paper handled. The Paper Trade never has contended against,—in fact, always has stood squarely committed to,—the principle that the printer should have this profit or handling charge on all paper passing through his plant, whether such paper was bought by him or not.

The underlying reason for the Price List agitation is the failure on the part of the printer always to secure this profit by making the necessary handling charge. How can we explain this failure? Ignorance of good business practice cannot account for it all. One of the big answers is fear—FEAR with a capital "F"—fear of a competitor—fear of a customer—fear of oneself. Why should not the printing fraternity insure its own proper profits the same as any other business, and not ask the paper merchant to be a martyr to the cause of helping the printer do what the printer should do for himself?

Now, let us answer the real question before us—

Why Not the Long Price List?

Here are some of the reasons for the "Why not":

1. Assuming and agreeing that almost immediately on its issuance it would become a matter of common knowledge that the Long Price List was subject to a discount and that the exact amount of discount also soon would be known, and again assuming and agreeing that printers could not or would not in every instance secure the Long Price List price for each lot of paper and that there would be a tendency among printers to split or juggle the discount with their customers because of competition with one another,—the net result would be that the integrity of paper prices would be absolutely destroyed and the whole plan would reflect discredit on printer and paper merchant alike, and the Industry would revert to the old order of things wherein price was pretty much an unknown quantity.

2. The printers' organizations frankly have admitted (and it is quite obvious) that they cannot obligate their members to confine all paper purchases to merchants issuing Long Price Lists or to print only such paper as they may buy. Without such reciprocal protection, the merchant would find himself in a most hazardous position.

3. Under any such system of pricing, particularly in the more important markets, it is inevitable that the larger consumers of paper and printing would seek and find elsewhere unrestricted lodgement for their business.

4. Some of the largest manufacturers of proprietary lines of paper merchandise, knowing the pitfalls in this whole proposition, positively have refused to allow their distributors to price their lines on any basis other than net-no-discount.

5. Many items in a general paper merchant's stock never reach a commercial printing press and are sold through other channels than the printing trade. Such items, because of competitive conditions, must carry net prices, and it would not be feasible or expedient for a merchant to operate with several price lists.

6. Such a Price List opens the way for many abuses and permits unprincipled merchants and printers, if such there be, to trade on the credulity and confidence of customers.

7. The Long Price List, as such, is a subterfuge, is unsound in theory and practice and would not accomplish for the printer that for which he really is striving.

8. The Long Price List, with the suggested revision in discounts to care for the fluctuating markets, is altogether impractical. Prices on all lines of paper merchandise do not move up or down in unison and an individual discount on individual lines is quite out of the question.

9. The method to be followed in pricing paper essentially is a problem of merchandising, and the responsibility for establishing and maintainng a safe and sound method rests solely with the paper merchant.

10. The legality of the plan suggested for the application of this Long Price List, at least in certain of its details, has been questioned seriously, and the provision for rebates certainly appears unethical, if it is not actually illegal.

What, You May Ask, Is to Be Said in Defense of the Net Price List?

We maintain that the Net Price List has done more to establish reliability of paper values than any other agency. It has become, in fact, a printer's compendium of paper knowledge and paper values.

It has appeared to the Paper Trade that the standardization of price by way of Net Price Lists which were known to be, and actually were, net prices has gone a long way toward giving the printer confidence in paper values and paper prices and dispelling from the mind of the individual printer the fear that his competitor was buying paper merchandise at a lower figure than he was, either by way of special price or extra discount.

Under the present method of fixing the NET full package, or ream, price as a standard of value with quantity prices graduated downward, prices can be quickly and easily changed to meet market conditions without in any way getting over into the field of fluctuating discounts from an inflated or artificial base.

These conclusions have not been reached through any one experience in any particular locality, but through an exhaustive study of, and intimate connection with, the question in all of its phases, and as applied throughout a large part of the United States.

The paper merchant stands, as he always has stood, pledged to a determination to give his customer proper protection, but he believes the protection of the rightful domain of the printer can be accomplished without restoring an obsolete custom, which long ago proved itself unfitted for the needs of the Industry.

Some literature recently was issued in a campaign to popularize the idea of a Long Price List and secure its adoption by the paper merchants of the country. Among other things, this literature contained a list of ten reasons why a Long Price List was the only correct list for pricing paper merchandise. It seems entirely fitting that in this brief we refer to these reasons and present our arguments against them:

Reason No. 1.—*It helps the printer in carrying out his logical function as the one legitimate retail salesman of paper.*

The commercial printer is not, and never has been, either a retail merchant or a retail salesman of steel, lumber, leather or rubber. This statement can be supported successfully and, therefore, the Paper Trade naturally refuses to accept a conclusion based on a false premise.

Reason No. 2.—*It does more than any other single thing toward eliminating the direct sale of paper to the consumer.*

It will not eliminate direct sale to certain large consumers or to those who always have been recognized by the trade because of uncontrollable conditions and the substantial size of their purchases as legitimate direct buyers.

The smaller consumers ought to be absolutely denied the privilege of buying direct, assuming that the paper bought ultimately reaches a commercial printing press.

It is altogether possible that a Long Price List would have just the opposite effect and encourage an extension of the custom of direct buying by large consumers.

Reason No. 3.—*It teaches the printer to think of paper in terms of selling price instead of cost, and thereby causes him automatically to transmit these terms to his customer.*

Is this not an indication of such inherent weakness as strongly to suggest the impossibility of the printer carrying out consistently any plan or policy that would insure his protection and profit?

Why should the printer think of paper in terms of cost? It certainly is not customary for either a merchant or a manufacturer to reflect costs to his customer.

Reason No. 4.—*It removes the paper dealer from competition with his own biggest customer, the printer.*

This is the same argument printers used years ago in connection with the printed envelope business. They wanted protection from the paper merchant and, to a large extent, received it, with the result that to-day a large part of the printed envelope business is altogether diverted from and lost by both paper merchant and printer.

There is a lot of big business that we frankly acknowledge the paper merchant and printer always will compete over until the printer ceases considering himself a retailer of paper. When he accepts the fact that he is a manufacturer or converter and makes the proper charge for handling paper, then, and not until then, will all competition in paper between paper merchant and printer cease.

Reason No. 5.—*It gives the printer his profit even when paper is sold by the paper house direct to the consumer.*

This reason involves the granting of special rebates. We are informed authoritatively that, even in the few markets where the Long Price List has been in vogue, this rebate plan has not proved successful or generally applicable to the business. It is unethical and savors of an apology on the part of the merchant for doing something he has no business to do; in other words, if it can be proved that such a rebate is right or righteous, then we claim such sales are illegitimate, and no method can be devised to make them legitimate. All of this is quite apart from the legal phase of the question.

Reason No. 6.—*It is a powerful educational factor for the consumer, as it teaches him proper paper stock values as represented in the completed job.*

Apparently this is is an opinion held quite generally by the advocates of the Long Price List. Just how they argue that they can educate the large consumer, for instance, to feel that these long prices represent true values, when the basis of discount will be only too well known and a little investigation and energy on his part will open up ways, and a number of ways, to get around the condition, is a mystery. We believe it will be a powerful factor in destroying confidence in values because there are too many uncontrollable factors to protect the plan.

Reason No. 7.—*It makes the charging of a proper profit, the line of least resistance, to the printer and strengths his selling morale.*

Apparently in this reason the line of least resistance is sought. What would lead us to believe that a printer would develop any more courage in demanding and securing his legitimate profit under a Long Price List, when he has not been able to do this under the present plan? He knows perfectly well that a handling charge is legitimate; why, then, does he not make it? The discount profit is fixed at a larger percentage than the one considered reasonable as a handling charge so that more latitude would be afforded for juggling and splitting profits. Certainly, all past experience proves that printers would not succeed in getting all or, in many cases, any of this profit.

Reason No. 8.—*It reduces economic waste in paper distribution by making possible the issuance of new discount sheets covering market changes, thereby obviating the necessity for issuing entire new catalogs and price lists.*

We already have explained how impractical it is to issue an arbitrary price list, changing discounts with every market fluctuation. This could be accomplished only by having varying discount sheets theoretically for every line of paper known. If a Long Price List was issued it would have to be issued just as often as a net list. Varying discounts from the Long Price List would destroy the basis for uniform handling charges.

Reason No. 9.—*It assures the printer of getting a legitimate profit on the paper stock used in his product.*

This practically covers the same ground as Reason No. 7. There is nothing that can assure the printer of getting his legitimate profit except his own courage and determination to follow the same line of wise commercial practice that induces all business men to demand and secure proper compensation for services peformed.

Reason No. 10.—*It is the logical method of pricing merchandise for re-sale and has proved its stabilizing effect in other lines of trade through many years of actual operation.*

Here, again, the argument is based on the premise that the printer is a retailer and that he is handling paper for re-sale rather than for manufacture or conversion. The stabilizing effect of the Long Price List idea in other lines of trade radically different from the Printing and Paper Trades is no argument why the same results can be expected in our Industry.

THE NEWSPRINT OUTLOOK.

Canada exported 58,182 tons of newsprint paper to the United States in July, an increase of 11,962 tons over the month of June preceding, according to a statement just issued from Washington. American imports of newsprint from Europe during the month totaled 7,882 tons, Germany sending 4,535 tons, Sweden 2,344, and Belgium, Denmark, Finland and the Netherlands making up the remainder. In June the European imports amounted to 4,558 tons. Taking the July imports from Europe as a monthly average for the year it would mean that the United States imports of newsprint from other countries than Canada this year, in spite of all that has been said about them, will fall below 100,000 tons, or less than 5 per cent of the normal American consumption of newsprint. Meanwhile, exports of newsprint from U.S.A., normally over 5,000 tons a month, have fallen to almost 500 tons. In normal times American newsprint exports would just about offset their present rate of European imports, leaving the domestic requirements to be filled by Canadian and American mills. Canadian newsprint authorities deduce from this statement that the situation as to their American market is still very favorable and likely to improve from now on. There are indications, such as a resumption of advertising to move fall goods, an increase in newspaper circulation due to a reduction in the selling price (Many American newspapers have recently come down from three to two cents a copy), and the starting up of new newspapers, which, they say, encourages the belief that from now on the demand for newsprint will gradually increase. Recent reductions in the contract price for paper will also contribute to this end. In Canada the federal election campaign is also expected to have a stimulating effect upon the newsprint market.

ACID STORAGE TANKS ERECTED.

W. H. White of Montreal has just completed the erection of the acid storage tanks at Kapuskasing, Ont., for the Spruce Falls Company this being the second large contract for tanks this firm has completed this year for the pulp and paper industry.

The Structure of Cereal Straws

By FRANCIS E. LLOYD, F.R.S.C.

General Summary.

In the following paper the results of a study of the structure of the four principal cereal straws have been given. The purpose of this study was to determine (a) the major differences in structure, especially as to the character and length of the fiber, and (b) the possibility of distinguishing the elements (cells) of each in a macerated product, or in a straw paper.

In view of the variability and overlapping of characters the latter task is not an easy one. The present attempt was of necessity confined to samples of four cereal straws supplied to the author. These embraced only one race, doubtless an impure one, of each kind. The findings were however, checked by comparison with pure, strain material (or nearly pure), with the result that it became necessary to revise some of the conclusions. This teaches that a thoroughgoing study of this sort must embrace a large array of materials, failing which the results must of necessity be to some extent equivocal, and subject to revision. With this admission, we are however permitted to say that it is possible by careful inquiry, to determine the origin of the materials in a given straw paper, or other straw-product, with considerable certainty.

Whatever the limitations however, of this study, it will serve to bring forward a basis for future ones in the same field without being negligible with respect of the amount and character of the information it contains, which, in both regards, is certainly in measureable advance of the present available. The latter is both meagre in quantity and often inaccurate in character.

It is the purpose of the present paper to give an account of the structure of the "straw" of the barley (*Hordeum*), oat (*Avena*), rye (*Secale*), and wheat (*Triticum*), based upon specimens from single localities and of ordinary ripeness, or degree of development. (1) It will be understood that minor structural differences, such as characterize various races of these cereals, and even a single race grown in different localities, are beyond our scope. Such differences may well have to be considered in the event that the straw is to be used for special purposes, but in any event they would have to be investigated in relation to such purposes.

It is further important that the structure of the straws of grasses shall be well enough understood so that it is possible to distinguish the origin of the structural elements as they may be found in materials, such as paper, manufactured therefrom; for it is easily possible that litigation may arise requiring such special knowledge in its settlement. That this task is by no means easy was the opinion of Wiesner (1910), who has given much attention to the general subject of paper materials. His conclusions, which indicate the difficulties in some detail, are more specifically mentioned beyond. It is believed that the evidence presented in this paper is such as to show that Wiesner was not wholly justified.

(1) The specimens were supplied by Arthur D. Little. Ltd., who also bore the major expense of the preparation of this work. The co-operation of the Forest Products Laboratory, especially through the valued assistance of Mr. W. B. Stokes in the preparation of negatives herein used, is heartily acknowledged. Mr. G. G. Moe collected material for comparison at the Experimental Farm, Ottawa.

What is "Straw?"

By "straw" is meant the stems of mature cereals and the remnants of various structures, especially of leaves which may remain attached thereto. The term is also extended to similar plants, such as esparto, when collected for use. "Hay" is the same thing, but is cut before maturity, so that there is a much larger amount of food material in the stems and leaves, which are at the same time less indurated, and in the immature grain (seed). When cereals are cut as hay, the unripe grain is left attached — barley hay, for example,—thus increasing the food value.

The straw that is obtained by machine threshing is always more or less broken, and in any event the leaves are shrivelled and more frequently torn away than otherwise. Owing to the peculiar structure of the leaves however, a part, namely the *leaf-sheath*, remains rather tenaceously, as will be seen later.

In reaping, the stems are cut off at about six inches from the surface of the soil. About this length of stem is therefore left behind, together with the parts (stems and roots) which lie on or below the soil surface. In this study, excepting only certain measurements of stature, these parts are disregarded, since they do not enter into any consideration of the usefulness of straw as such.

The Natural Affinities of the Cereals.

The cereals or grain plants belong to a large and universally distributed group of plants known as the grasses (*Gramineae*). It need hardly be said that these plants are of fundamental economic importance, primarily as food, and secondarily in manufacture. In addition to our own familiar grains, rice (*Oryza sativa L.*) may be mentioned as of an importance as a food supply equal to, if not greater than, all the other cereals taken together, as a present economic fact. Indian corn, or maize (*Zea mays*), sorghum, Kaffir corn ("durrha") and sugar cane are other well known examples of prime importance. In the orient young shoots of the bamboo are used as a vegetable. A very great variety of grasses furnish grazing and hay, thus adding to a grand totality of usefulness, which is discounted but little by the fact that a very few grasses are poisonous. More than usually interesting in this connection is the fact that ergot, a highly poisonous but therapeutically useful product of grains, is the hypertrophied grain (especially of rye), caused by the presence of a fungus parasite, (*Claviceps purpurea*).

Of possibly great economic importance in Canada is the wild-rice (*Zizania* spp.) which furnished a staple food for the Indians, and which offers an opportunity for extending cultivation to lands which cannot be drained sufficiently for other agricultural purposes.

As to other uses, the grasses furnish material for a variety of purposes ranging from building to personal adornment. In the tropical regions are found the giants of the host, the bamboos, which more especially in the orient grow to large sizes (70 feet tall) in many cases, and furnish an amazing variety of materials for use in building, boat building, furniture making, and in the making of an endless variety of smaller articles. The

straw from the heads of sorghum (broom-corn) is used in the manufacture of brooms and brushes.

The mechanical qualities which fix the value of the material for these purposes are the combined strength, lightness and springiness which are exemplified in the highest degree in the split bamboo fishing rod. Even ordinary straw of common grains shows these qualities in a remarkable degree, relatively to the amount of material in it. One needs but to recall the lightness and stiffness of a lemonade straw—now largely supplanted by imitation straws made of paper and paraffine—to realize this.

The Structure of Straw in General; Gross External Structure.

As has been indicated, straw consists of two parts, the stem and the attached leaves. The stem is composed of straight stretches of approximately cylindrical shape and various lengths, the *internodes*, articulated at the *nodes*. Properly speaking the node is merely the transverse region of the stem from which arises a leaf. In the grasses however, the base of the leaf is usually swollen, forming a prominent band (motile organ) about the base of the succeeding internode (figure 1.). In the dried straw this swollen collar is shrunken, and presents characters which enables one to distinguish between the kinds of straw here under consideration in some degres.

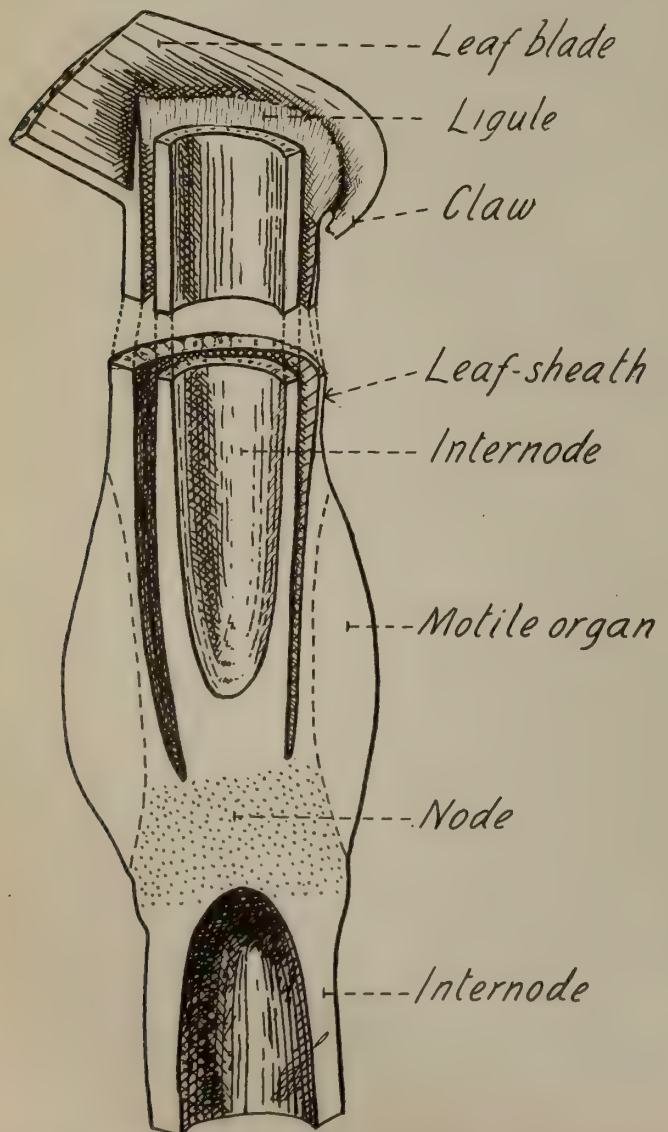


Fig. 1.—Longitudinal sections through a node of wheat straw. The broken lines indicate the shape of the leaf base (false node) when dry and shrunken.

The leaf is composed of two parts, the *leaf-sheath* and the *blade*. The leaf-sheath is the lower portion which springs from the node and folds about the internode above. At the top of the sheath the blade springs away from the stem, and at this point is found a membranous projection which clasps the stem apparently as a continuation of the sheath, known as the ligule (figure 1, 29). The edges of the blade sometimes project, clasping the stem (figure 29). The projections are called auricles or, more simply, *claws*. The size, shape and other features of this organ serve as distinguishing marks for identification, which, in the absence of the grain and its accompanying parts, are relatively of great use in the recognition of the kind of straw (Carrier, 1917).

At the base of the blade there is always a more or less conspicuous transverse zone, the *collar*, having, when well developed, much the same structure as that found in the swollen base of the leaf sheath, (as *e.g.* in orchard grass). When inconspicuous, as is the case in the grains here to be considered, the collar is indicated only by a more or less evident thickening of the veins as they traverse it. The collar is a motile organ analogous to the swollen leaf sheath base, and at this point the blade bends into a position approximately at right angles to the axis of the plant.

The swollen leaf bases, which may here be called *false nodes* for the lack of a better term, are important organs by which the growing grass shoot maintains its upright position. Should young grain be "lodged", the upper portion of the stem will readily regain a vertical position, and on examination it will be found that the requisite bending has been confined wholly to the false node and the ensheathed base of the included internode, as evidenced by the unequal development of the false node on the upper and lower sides. It is only rarely that the lower parts of straw do not show more or less bending. The false nodes and leaf sheaths, incidentally, help to distribute the strains imparted to the straw by bending, as e. g. under a heavy wind, so that the breaking of the stem at the base of an internode is usually obviated. This view of the mechanics of the grass straw has been denied, but without good reason. As a matter of fact the younger tissues of the internode are at the base, and the weight of the parts above could not be successfully supported during development were it not for the leaf-sheaths. This is very obvious in growing corn (maize). In the dead, dry straws the false nodes very obviously form supporting bands, strengthening the shaft at these points. To be sure the tissues are in this condition hard and indurated, while in life they are much softer and more pliable. In any event, however, the mechanical value of the false node is but contributory, while its primary function is that of a motile organ, as above explained.

The leaf in the grasses is always conspicuously ribbed and veined, the veins running parallel, except for their gradual convergence toward the apex, and the same is true of the stem, except at the nodes, where the veins branch and redistribute themselves into the leaf and next node above. (2) In harmony with the anatomical scheme underlying the structure of grasses, there is an evident elongation of most of the external and internal structures. (To be continued.)

(2) This topic is apart from the present purpose, and hence will not be further mentioned. Those interested may consult Chrysler, 1906.

Two Volumes of Text Books are Ready for Delivery

The following paragraphs are taken from the four page letter which is being distributed by the Canadian Pulp and Paper Association.

Why Books Are Needed.

Dear Sir:—Successful men are constantly studying. It is only by studying and by applying the knowledge thus obtained that they ARE successful

There are many men from maker and reel boy to superintendent and manager who want to learn more about the industry which give them a livelihood, and, by study, to fit themselves for promotion and increased earnings.

The war of competition is on, and the battle will be won by those who have knowledge. How will you obtain your knowledge of the industry? Will you get it in the hard, slow school of experience or will you take the weapon provided for you by the men of your own trade—a set of text books prepared by the best brains in the Canadian and United States industry?

These books are unique in that they represent the co-operative effort of the Pulp and Paper Industry of a whole continent. Every cent of the cost of preparing them has been borne by the pulp and paper mill of Canada and the United States, and the price asked for these text books covers only the actual cost of their publication.

You have only to glance over the synopsis on page 3 to discover the unusual attention to detail with which which the subject has been treated.

Can you afford to be without these books?

CANADIAN PULP & PAPER ASSOCIATION.

Do You Know?

The measure of a man's value to the world and to his business is the knowledge he possesses and applies to his work. It is his understanding of the reasons for the various processes used in his trade which lifts him above the machines he operates. But he must "know," not guess. There's no surer way of testing your knowledge than by trying to answer such a list of questions as that given below. Don't be surprised if you miss one. There's so much to be learned about the pulp and paper industry that no one man can possibly know it all. That's why it has taken the combined efforts of many experts to compile these text books, to answer the thousand and one questions which are constantly arising. Look over this list, and ask yourself if you know:

What is meant by consistency?
How to find how much air-dry pulp in a car?
How to read a blue-print?
Why alum is put in the beater?
Why a press roll is crowned?
The dimensions of common sizes of paper?
How to find the production of a paper machine?
What becomes of the white water?
How to put on a wire?
Why chemical pulp lasts longer than mechanical?
What production to expect from a wet machine?
Why sulphite, soda and sulphate pulps are so named?
Why the three primary colors will produce nearly every shade?
The difference between "slow" and "free" stock, between "wove" and "laid" paper?
Why pulp for bond paper requires longer beating than for book paper?
The difference in conditions for cooking newsgrade and easy-bleaching sulphite?

What These Books Contain.

Some idea of the scope of these text books may be gained from the following synopsis. Though this synopsis presents but the barest outline of the many subjects treated upon, it will, nevertheless, repay the most careful reading. Even a glance at this outline will show that no text books even remotely approaching these in breadth of treatment, have ever before been available in the pulp and paper field.

Synopsis of Contents:

VOLUME I.—Arithmetic, Reading Working Drawings, Mathematical Applications, Elementary Physics.

VOLUME II.—Mechanics and Hydraulics, Elementary Electricity, Elementary Chemistry.

VOLUME III.—Properties of Pulp Woods, Wood Preparation, Mechanical Pulp, Sulphite Pulp, Soda Pulp, Sulphate Pulp, Treatment of Pulp, Refining of Pulp, Bleaching of Pulp, Testing of Pulp.

VOLUME IV.—Preparation of Rag and Other Fibres, Treatment of Waste Papers, Beating and Mixing, Engine Sizing, Coloring, Loading, Paper Making Machines, Hand-Made Paper.

VOLUME V.—Tub Sized Papers, Manufacture of Special Papers, Boards, etc., Finishing Operations, Paper Testing, General Mill Equipment, Coated and other Treated Papers, Mill Organization, Dictionary of Papers, Tables, etc.

These five volumes cover modern practice of pulp and paper making in a most practical manner and in language that cannot be misunderstood. They include even the fundamentals of mathematics and science, so essential to understanding the mechanical and chemical processes and apparatus which are fully explained and profusely illustrated. While prepared especially to meet the needs of correspondence instruction and home study, they are equally well adapted for classroom use and reference purposes.

It is distinctly to your interest to consider most carefully the opportunity here presented to you in the form of these books and with a view to increasing your earning power. By so doing, you not only improve your chance for promotion, but in an important way help to raise the status of your industry.

Volumes I and II for preliminary instruction in fundamental mathematics and elementary science are now on sale at $5.00 per volume. In the selection of classroom problems bearing on the principles and practise of pulp and paper manufacture, in illustrations and in typography they represent the highest standard in textbook publishing. Volumes III, IV and V on Preparation of Pulp and Manufacture of Paper are in preparation and will be issued shortly.

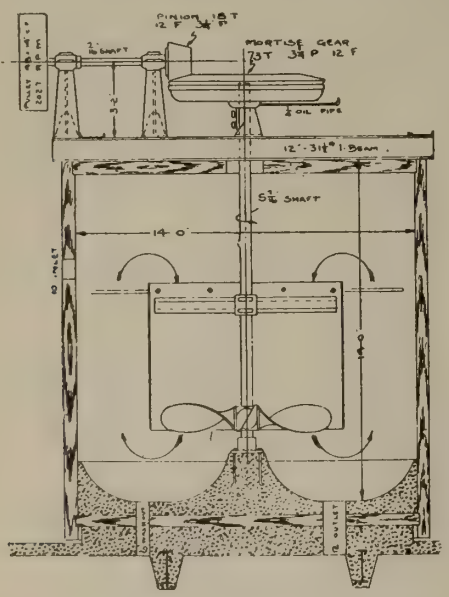
The Pulp and Paper Magazine is co-operating with the Canadian Pulp and Paper Association and has been appointed distributing agent for the textbooks. As no profit is anticipated in the transaction, it is necessary to ask that all orders be accompanied by remittance. Fill out the enclosed order and mail it to-day.

HOW THE MIXER WORKS.

The tendency in modern news mills today is to get away from the use of beaters. In place of beaters, there is used what is known as a mixing tank. These tanks require the use of slush stock, ground wood stock being pumped from the decker chest into the mixing tank up to a certain level, after which enough sulphite is added to fill the tank nearly to the top, the number of inches of sulphite put into the tank indicating the percentage of sulphite that there will be in the finished sheet of paper. Into this tank is also placed any sizing or coloring matter that may be used in the sheet, and then by means of some form of agitation the material in the tank is thoroughly mixed.

The Jones mixing tank here described is really nothing more or less than a man's size edition of the old egg beater which we have all seen in use in the kitchens of our homes. In this respect, however, it is entitled to the name "beater."

Down in the botton of the tank, fastened to the lower end of the vertical shaft is a large cast iron propellor, exactly like the propellor used on the steamers that are being built in our shipyards. In the center of the tank and surrounding the propellor, there is a steel cylinder, supported from the sides of the tank. The propellor



shaft is turned by means of a mortoise gear and driving pulley on the top of the tank, as shown clearly by the illustration. The direction of rotation of this propellor and the pitch of the blades is such that the stock is sucked down through the inside of the cylinder and is discharged from the bottom of the cylinder toward the curved bottom of the tank, which deflects it upward again, as indicated by the arrows in the illustration. In this way a very thorough mixing of the material in the tank is obtained.

The form of mixing tank above described is the one in use at the Camas plant. At the West Linn plant the mixing is done by agitators connected with a vertical shaft, and not by a propellor as in the Jones tanks. In other mills agitators are not used in these tanks, but a pump is depended on to do the mixing, this pump drawing stock from the bottom of the mixing tank and delivering it into the top of the tank.

No doubt all of us have seen the outside of these tanks, but we have not all had a chance to see inside of the tank, we hope this little article will make clear "how it works."—Making Paper.

WHAT IT COSTS TO PLANT ARTIFICIAL FORESTS.

The first survey of the actual cost of commercial planting of forests now being made by the Woodlands Section of the American Paper and Pulp Association, is showing some surprising results, indicating that the costs are much lower than has customarily been estimated. The paper mills of the county are beginning on an extensive scale to grow from the seed up their trees from which their future paper mill will be made, and the chief handicap to success is now found in taxation methods which prove a constant drain on the owner during the period of growing the crop.

The cost figures have been classified by districts. The New York cost is figured at less than $15 an acre in most cases. One extensive plantation cost $13 per acre, including cost of stock. Another figured the cost of seedlings at $4 per thousand, while still another found that by planting tree seeds in an ordinary truck garden as an auxiliary crop, it cost only $40 to $50 to produce 200,000 transplants. The success of the New York state plantations ranged from 90 to 99 per cent of survivals.

One big Canadian company found its cost, planting much closer than is the custom in the United States, to be $15.12 an acre. Ohio, planting cottonwoods, fixed the cost at $13.93 per acre.

New Jersey plantings, with a wide variance in species and locations, found a cost varying from $5 to $15 per acre. Vermont's costs ran to no higher than $12, with an average of $9 per acre and the New England success in general ran high, ranging from 80 to 95 percent of survivals.

This low cost figure for establishing new forests, indicate that there will be a wide expansion of reforestation activity by paper mills in the east which must grow trees for their future supply or depend on imported raw material.

A large number of inquiries have been coming in to the office of the New York State Barge Canal at Albany relative to the shipment of wood pulp consignments via the canal route. Many of the large users of wood pulp buy their product from Canadian firms and it is thought that the water route by way of the Great Lakes and the Barge Canal can be used at a great saving over rail routes. Utica users of pulp are particularly interested since they have found that, even though they must take care of shipments from the Barge Canal terminal to their warehouses, rates figure are much lower than any other present means of shipment.

The Federal Power Commission has issued a license to the Alaskan-American Paper Corporation, permitting them to engage in paper making operations in the Tongass National Forest near Ketchikan, Alaska. This brings to a consummation plans of interests back of this concern, which have been long endeavoring to establish in the manufacture of pulp and paper in the far North.

The directors of Abitibi Power & Paper Company, have declared a dividend of 1¾ per cent., payable October 1st, to shareholders of record September 20. That ought to catch the eye of some of the calamity howlers, whose voices were heard recently.

Texas Gulf Sulphur Company (Incorporated) have moved their New York Office to 41 East Forty-Second Street, New York City.

British Trade News

(From Our London Correspondent).

London, Aug. 31, 1920.

There is a ray of hope for improvement in business looming in the paper industry of the United Kingdom. Someone may ask how this conclusion is arrived at! Well, I am one who believes in the labor market as a barometer indicating the signs of progress of trade and then I look to the shipping lists for further evidence. A Scotchman may have his opinions of trade in his own beloved land; an Englishman will study his case as it is present in the North of England and the gentleman of the South will give an outlook from his point of view. Added to these are the Irishmen, who are fighting against local troubles and importations of paper. So that when all the opinions are taken, sorted, and weighed, there is always a balance found wanting. Therefore, statistics and the shipping lists are the nearest adjuncts to tell the true story. Today they show that there is more work being done in the paper mills, there is more employment, and business is making a gratifying recovery in a steady and wholesome manner. Now mills are not being run on a charitable basis, but on business lines. They are absorbing more workers; they are not doing it for charity—they are getting busy and the unemployment list is slowly coming down each day. Judging by the shipping lists and the news about London—usually dropped at the table of the evening meal—more orders are reaching the manufacturers and even the wrapping paper section is looking lively. The outlook is certainly bright and the return of business for August and September may be very encouraging. Newsprint still stands at 6½ to 7 cents a pound according to contracts made. The other day I was speaking to a big consumer of newsprint from the provinces, 50 miles from London, and he told me that he was paying 7 cents a pound —and and the paper was not half as good as Canadian.

Depression On The Continent.

Reports from France and Belgium show that the paper industry in these places is passing through a critical period. Markets have been lost and workers in many of the mills are on short time, in fact in some cases only half the complement of mill hands are employed. The only people showing signs of activity are the board mills in France and it is stated that they are doing a fair amount of trade. In Scandinavia labour troubles are still in existence and Norway is suffering most of all. The root of the evil is the question of wages and threats are being made on both sides—employers and employees—as to what the ultimate result will be. Scandinavia has been very unfortunate since the beginning of the year with the labor demands and the employers are just as stubborn as the workers. Germany and Hungary are slowly plodding along, but complaints are being made against the dullness of business.

Newsprint Consumers v. Producers.

The newsprint consumers in the United Kingdom have returned to the fight against the paper industry being classified as a "key" industry under the safeguarding of Industries Act, known as the Anti-Dumping Act. It is now law and comes into force on October 1st. When the paper industry was de-controlled it was strongly recommended that it should become a "key" industry and it is up to the Board of Trade to say so. From what I can hear the papermakers are going to prove that they should be safeguarded by the Act where there is unfair competition and an irregular rate of exchange. That is all they ask. They do not object to fair competition, but they do object to countries with debased rates of exchange sending paper into the English market and selling it at less than the cost price of the English product. The consumers cannot see the point—and they do not intend to either—because it is to their advantage. They do not want to pay 6½ and 7 cents a pound for newsprint if they get a foreign product for 6 cents or less—a price which the British mills cannot produce at. According to the new Act foreign made goods are liable to an ad valorem duty of 33 1/3 per cent if sold or offered for sale in the United Kingdom (1) At prices below the cost of production (95 per cent of the wholesale price at the mill) in the country of origin; or (2) At prices which, owing to depreciation of currency in the country of origin (not being a part of the British Empire), are below the prices at which similar goods can be profitably manufactured in the United Kingdom. When referring any matter under (1) and (2) to a committee the Board of Trade shall direct that the committee shall report also on the effect which the imposition of a duty on goods of any particular class or description would exert on employment in any industry using goods of that class or description as material. The consumer—printers, publishers, and newspapers—say they come under the last provision.

The Method Adopted.

I have mentioned that this new Act comes into force on October 1st and it would be as well for the Canadian Trade Commissioner or Chamber of Commerce in London to watch the interests of the Dominion paper and pulp men. So far as I am concerned I will do my share. Now the Board of Trade will set up a permanent body of persons having commercial and industrial experience. When an application is received for an industry to be safeguarded, five men will be selected from the permanent body to see if the particular industry should be scheduled under the Act and the Board of Trade will not refer any matter involving a question of the depreciation of currency in a country unless they are satisfied that the value of the currency in relation to British sterling is less by 33 1/3 per cent, or upwards, than the par value of exchange. Germany, Finland, and Austria are the countries to which the Act may apply. The consumers say Sweden also, but that is not so as under an old agreement with the Imperial Government Sweden and Norway cannot be interfered with—neither can France. The consumers also say that Canada and Newfoundland may be left out of account, but so far as papermaking is concerned clause 2 safeguards the Dominion and it is questionable if there could be any interference with Newfoundland.

A Case in Point.

Supposing the Board of Trade, after receiving an application, agrees that the industry of papermaking is one that should be safeguarded and brought under the Act they refer the application to the five gentlemen selected from the main body for consideration and evidence. The committee of five must not include any man whose interests may be materially affected by any action the matter decided to take, and the evidence can be taken publicly or privately—whatever they may decide—but all the persons interested and concerned in the issues involved are entitled to

be in attendance. The papermakers will consequently make out their case against countries with "depreciation of currency" in the presence of the consumers and judging by the threats already thrown out by the latter gentlemen they are determined to expose the alleged high profits made by the paper mills in wartime. They will, however, have their work cut out for them to do so, as the consumers are totally ignorant on the subject of paper production and its costs. It will be a "ding-dong" fight, with its amusing sides. To one who understands both sides, the consumers and producers, it must be admitted that the former are tackling the subject from the wrong direction and the latter, if Mr. Foster, of the Papermakers Association, and a few other good ones get at them, will soon show that the consumers have "got hold of the wrong end of the stick." But amidst all these revalent and irrevalent issues, the fact must not be lost sight of that under the Act as it stands today—and it is law—a Dominion, such as Canada, could come under clause one and it is for this reason that Canadians should give instructions to their representatives on this side of the Atlantic to watch their interests during the operations of the Act. There is no antagonistic feeling against Canadian products, but in all flocks there is bound to be a hot-head out for doing mischief.

WHALEN MILLS REPORT PROFITS.

Indications of a good business year for the Whalen Pulp & Paper Mills, Ltd., are seen in the report for the year, ended February 28, 1921, submitted to the shareholders at Vancouver. Operating profits were $1,208,854, compared with $878,549, and after deduction of taxes and charges and writing down log inventories, but before depreciation, there was net profit of $530,603, compared with $323,757. Current assets show a small surplus over current liabilities, but the position in this regard has materially improved since a year ago. Current assets now stand at $2,017,865, aganst $1,152,747 last year, and current liabilities are $1,919,118, against $2,184,424 last year.

Inventories have arisen to $7,725,042, against $1,003,080. Current liabilities include an obligation to the Bank of Nova Scotia of $925,000, whereas the debt to bankers a year ago was $1,330,178. There is an item of accrued wages this year, amounting to $111,987, and another of accrued interest on bonds, debentures and notes, $139,875, compared with $98,223 last year. The company's investments remain unchanged at $20,000 in Victory bonds. Property assets are entered at $16,976,053, against $15,455,074 last year. Total assets are $19,657,663, against $16,818,608.

President McGarry reports that during the year $858,735 was spent on capital improvements, being chiefly on the completion of the work commenced in the previous year, and the improvement of power conditions at the Port Alice plant. The sum of $100,000 of 6 per cent. first mortgage and refunding gold bonds, and $100,000 gold notes were retired during the year, and the sinking fund provision for retirement of gold notes increased by $88,354.

"To provide for the extraordinary depreciation in certain commodity prices in the latter months of the year," says Mr. McGarry, "practically $300,000 was written off the book values, chiefly on logs and finished products. The valuations placed on all inventories were cost or market, which ever was the lower.

"While the pulp markets were very satisfactory for the first part of the year, full advantage was not enjoyed by your company by reason of the construction work being carried on. The markets suddenly declined last fall to a very marked extent, which reflected on your earnings.

"All construction work has now been completed, and it is the policy of the present management to make no further capital expenditures unless essential to the prosperity of the industry."

The comparative production by the Whalen Company for the past three years was as follows:

	1921.	1920.	1919.
Pulp (tons)	51,731	47,962	41,814
Lumber (.M. feet)	8,423	12,731	20,081
Boxes (M. feet)	536	1,493	1,896
Shingles	53,824	61,198	49,190

DESIGNER OF RECORD NEWS MACHINE RESIGNS.

Mr. George D. Kilberry, who has been chief engineer of the Paper Machinery Dept. of the Dominion Engineering Works, Ltd., is retiring from that position on Oct. 1, but is not ready to announce his plans quite yet, but expects to remain in Canada. Mr. Kilberry come in from the United States to take charge of the design of the new Laurentide Machines and has the satisfaction of seeing them well ahead of all previous records for news print machine speed. The Dominion Engineering Works did well in choosing him and now have the enviable reputation of having built the first machine in the world to make high grade newsprint successfully and continually at more than 1000 feet per minute. In fact, it looks as if the Laurentide machines can, and will, be run at 1100 feet.

CHANGE OF ADDRESS FOR T.A.P.P.I.

Changes are impending in the secretary's office of the Technical Association of the Pulp and Paper Industry. The office itself has been removed from 542 Fifth Avenue to the general offices of the American Paper and Pulp Association, 18 East Forty-First Street, New York, where quarters have been provided on the sixth floor by Executive Secretary Baker.

A meeting of the executive committee of T.A.P.P.I. takes place this week on Thursday, September 15, at which important action will be taken concerning the proposed Fall Meeting at Washington and other points, October 18 to 21. There is a growing sentiment among the officers of T.A.P.P.I. and the committee of arrangements for the meeting, that the severe depression now existing in the paper industry is a reason why the Fall Meeting should either be cancelled or postponed to a date in 1922. A definite decision on this question will be reached at the meeting of the executive committee, at which new policies for the Association are also likely to be put into effect.

FREIGHT RATES ON PULPWOOD LOWERED.

The Manitoba government has been successful in having freight rates on pulpwood lowered. Premier Norris announced that the new rate would be the same as that on cordwood, the extra charge on pulpwood of 2½ cents per hundredweight having been removed.

Asked if the government intended pressing the board of railway commissioners further for reduced freight rates, Premier Norris said the government would exhaust every effort to have the rates lowered before this year's grain crop starts to move in quantities to the head of the lakes.

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. Determining Moisture Content of Wood. Chem. Met. Eng., xxiv, 964 (June 1, 1921); **Pulp and Paper,** xix, 616 (June 9, 1921). A specified weight of wood chips, usually 100 Gm., is immersed in kerosene in a flask of retort, and the mixture is heated until all the moisture has been driven off. The latter is cooled in a condenser and collected in a graduated cylinder, along with the small amount of oil which is vaporized. The amount of moisture in the chips is read directly from the graduate. This method has been checked for accuracy with the method of weighing samples before and after oven drying, and the variation found to be less than 1 percent.—A. P.-C.

A-1. Soluble Carbohydrates in Pine Wood. S. SCHMIDT-NIELSEN. **Tekn. Ukeblad,** lxvii, 353-5 (1920); **Chem. Ztg.,** xlv, **Rep.,** 32, (1921); **J. Soc. Chem. Ind.,** xl, 342A (May 31, 1921). Pine wood felled in the spring was finely rasped, and after extraction with ether was repeatedly extracted by alternate boiling with water or 0.3 percent acetic acid and treatment with alcohol. By more than twenty successive extractions a yield of soluble matter was obtained equal to 12.04 percent of the original wood or 13.9 percent of the dry substance. In the determination of reducing sugars by Kjeldahl's method 1 Gm. of the dried extract, before inversion, reduced 0.1898 Gm. of copper, and after inversion with 2 percent hydrochloric acid it reduced 0.6155 Gm. of copper. A substantially similar extract was obtained from pinewood felled in the winter, but the yield in this case was only one-seventh of that mentioned above. Pentosan determinations on the extract indicated about 23 percent of xylose.—A. P.-C.

A-3. Papyrus Pulp. RAYMOND FOURNIER. **Papeterie,** xliii (May 10, 1921). Description of papyrus. of its microscopical characteristics, and method of preparation of the paper pulp. The fibers are fine, regular, cylindrical, but generally rather short, the extremities being pointed and sometimes bifurcated. They are 0.5-3 mm. long (av. 1.80); 0.008-0.025 mm. in diameter (av. 0.012). The felting power (length/diameter) is 150, which is rather good. The lumen goes right through the fiber and is about one-third of the diameter. The fibers are colored light yellow by iodine and sulphuric acid, darker yellow by chloride of zinc and aniline sulphate, and red by phloroglucinol. The purified cellulose fibers are colored violet by chloriodide of zinc. Papyrus may be treated by lime or cold caustic soda, but the regular soda process is the one best suited; and by varying the conditions of working (percent of caustic soda, time and pressure of cooking) different qualities of pulp are obtained suitable for practically all kinds of papers. The stems are crushed between rollers, boiled for a few minutes in water, caustic soda added, and the whole boiled some time longer. The material is then defibered and thoroughly washed. By using 3 to 14 per cent of caustic soda (on the weight of the dry raw material) yields of 45 to 18 per cent of pulp were obtained, and the total time required for the treatment (exclusive of drying was never more than two hours. The pulp is bleached to a cream color with a fairly low consumption of sodium hypochlorite.—A. P.-C.

A-5; A-14. Action of Sodium Hydroxide on Wood Pulp. W. G. HARDING. **J. Phys. Chem.,** xxv, 201-3 (1921); **J. Soc Chem. Ind.,** xl, 342A (May 31, 1921). The product remaining after heating wrapping paper with 1 percent sodium hydroxide solution at 100° Cent. amounted to about 60 percent of the original material, though absolute equilibrium was not reached even after thirty hours' treatment. With 6 percent sodium hydroxide the same result was obtained in about six hours. Lignocellulose could be detected in the material after treatment.—A. P.-C.

A-12. Chemical Reaction Affects Casein Glue. Chem. Met. Eng., xxiv, 964 (June 1, 1921); **Pulp and Paper,** xix, 613 (June 9, 1921). The decomposition of ordinary alkaline casein glues is not due to the action of bacteria or molds. It appears to be due entirely to chemical action of the alkali in the glue. This conclusion is based on the following observations. Increasing the amount of alkali in the glue increases the rate of decomposition when the glue is kept wet; glues containing no sodium hydroxide, although deficient in some important respects, do not decompose as rapidly as similar glues containing sodium hydroxide. Cultures of molds and bacteria could not be obtained from decomposed alkaline glues. Some chemicals which have antiseptic properties are found to improve casein glues, but this improvement is due to their chemical action rather than to their toxic properties. Glues can be completely decomposed in a short time at temperatures above that at which bacteria can live.—A. P.-C.

A-14 & 15. New Test for Lignin. P. GASPARIS. **Pharm. Monats.,** i, 121-9, 137-46, 153-60 (1920); **Chem. Zentr.,** lxxxxii, II, 584 (1921); **J. Soc. Chem. Ind.,** xl, 343A (May 31, 1921). Lignified cell walls may be distinguished from those consisting of unaltered cellulose by means of a 15 to 40 percent solution of cobalt thiocyanate which colors lignified membranes blue. The reaction probably results from adsorption; it is more sensitive and trustworthy than Maule's permanganate reaction or the phloroglucinol-hydrochloric acid test.—A. P.-C.

A-14 & 0. Determination of Starch in Presence of Cellulose. F. KAULFERSCH. **Z. Nahr. Genussm.,** xxix (June 15, 1920); **Chimie et Industrie,** v. (May 1921). Ammoniacal copper oxide is used to dissolve the cellulose which prevents the diastase from acting on the starch grains. The copper is then precipitated by means of hydrogen sulphide, and the diastase is allowed to act in the presence of the precipitated copper sulphide for about six hours at 65° Cent. The liquid is filtered and the sugar inverted by heating with hydrochloric acid under a reflux condenser. The glucose thus formed is determined by means of Fehling's solution. Two determinations were run simultaneously on two portions of 0.2 Gm. of flour, to one of which was added a solution of 0.02 Gm. of filter

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UNITED STATES NOTES

A clarion call for action on the forestry question has been issued by the American Forestry Association. It urges upon publishers the necessity for taking immediate steps for the replenishing of forest crops to furnish future pulp material. In a statement based upon a recent report of the Committee on the Elimination of Waste in Industry of the American Engineering Council, the American Forestry Association makes the suggestion to the World Press Congress meeting in Honolulu next month that it adopt a program for the elimination of preventable wastes—notably from conflagrations—and also that it put into effect without further delay some comprehensive reforestation plan. "There are 81,000,000 acres of idle land in the United States that should be put to work growing trees at once," the association's statement concludes, "This is a proposition directly tied up with national prosperity now and in the future. All the money in the work world will not buy food. All the money in the world will not produce trees to order. We must begin right now to protect what forests we have and to save forest crops every year just as we have corn and wheat crops. The Committee on the Elimination of Waste in Industry has performed a valuable service, but the great waste is idle land, and a great part of it is in the East and Middle West close to the greatest consumers, who are now paying thousands of dollars on freight rates, to say nothing of a high market price." Touching upon what it regards as the practical phases of the situation, the association points out that "there is no question but that a perpetual supply of pulpwood for all needs is a possible and feasible scheme. It will not, however, come merely for the asking. There must be, first, a proper national forestry law with adequate provisions for fire protection and government of reforestation on a scale large enough to demonstrate the economic soundness of the idea; second, every other State must adopt thorough-going forestry principles with provisions to protect growing timber from exorbitant taxation; and, finally, with these laws as a basis, the pulp and paper industry, together with all other wood-using industries, must be made to see that in practical reforestation and conservation lies their only salvation. To accomplish these three things will require the united effort of every man and woman. We should not leave to any group of foresters and legislators the sole initiative in solving such an important economic problem; but, by the continued expression of our thought and conviction, we can urge those groups to supply our imminent needs."

As the result of a recent conference held at the headquarters of the Bureau of Standards, Washington, D.C., and attended by representatives of the paper and allied industries as well as members of the Bureau staff, committees were chosen to take up the several phases of work connected with paper standardization. This preliminary conference was attended by representatives of the American Paper and Pulp Association, the Technical Association of the Pulp and Paper Industry, the United Typothetae of America the American Engineering Standards Committee and paper manufacturing and merchandising establishments. The committees appointed are on classification, definitions, simplification and specification. They will report on their findings back to the bureau.

Damage estimated to reach a total several million dollars was caused by destructive forest fires reported from various parts of the country during the past week. $1,000,000 is the approximate loss sustained through a stubborn fire which, among other things, destroyed the town of Jeffris, Wis., early in the week. This place is some twelve miles from Rhinelander, and its principle industries consisted of big lumber mills, a pulp and paper plant and a refrigerator factory. These, at last accounts, were in danger of complete destruction. Two hotels, the theatre, several stores and dozens of homes were burned. A ten mile blaze to the north and south of Arthyde, Minn., called out 1,000 soldiers of the Minnesota National Guard as fire-fighters in addition to the regular and volunteer forces that were working to check the fires. Despite their combined efforts, the village of White Pine was wiped out, and the fires continue at this writing only slightly checked, having been fanned up anew when a thirty mile wind sent them out beyond the control of fire lines. Two other extensive fires, one in the vicinity of Old Town, Maine, and the other on the Idaho-Montana border, were subdued when rains or subsiding winds came to the aid of the fire fighters.

The Argo Paper Mills Corporation, recently incorporated under the laws of Delaware with a capital of $3,000,000 to engage in the manufacture of print paper, has acquired the old plant and buildings of the Argo Company at Gloucester, N. J., and has completed plans for their remodelling upon an up-to-date basis. The new concern will deliver its entire product of newsprint to the Philadelphia *North American* and the Philadelphia *Record*, long term contractural arrangements having been entered into to that effect. The plant is in a location convenient to the quarters of both newspaper quarters, being just across the river from Philadelphia, and making the haul of the rolls, after ferriage, just as near as at present from the warehouses. It is more than probable that the first machine to be installed in the factory will be turning out paper no later that next January. Beginning with about 50 tons a day, it is expected that 200 a day will be reached with the installation of the last machine in another year or two. The officers of the new corporation are U. M. Waite, of the Reliance Mill and Trading Corporation, New York; president; N. A. Considine, head of the Paper House of Pennsylvania, secretary; and Raymond J. Considine, treasurer. The latter is also an official in the Paper House of Pennsylvania.

W. H. Carter, D. H. Greene and F. M. Gill, according to an announcement made by Gill & Co., brokers, Denver, Colo., have purchased the main building of the old Platte River Paper Mill Company in Denver and will begin as soon as the plant can be put into shape to manufacture paper products—principally tissue napkins and wrapping paper. The company is to be known as the Colorado Paper Products Company. Waste paper will be used exclusively as raw material. Ultimately the company intends to branch out in the manufacture of flat news print.

PULP AND PAPER NEWS

The Canadian National Exhibition, which annually renders Toronto the Mecca from all over the country for those who wish to keep abreast of the times in agricultural, scientific, artistic and industrial progress, was, this year, admittedly the most successful in a long line of notable successes. For one thing, the attendance eclipsed all previous records—a result, no doubt, largely due to the fine weather that prevailed, almost unbrokenly, throughout the fortnight. For another thing, the Exhibition has become more thoroughly and adequately systematized than it used to be. And, thirdly, this year's exhibits were on an even larger and more representative scale than ever. The Ontario Government's Forestry Department was responsible for a very comprehensive exhibit, "Algonquin Park," which should prove of very great value in giving the people of Canada some indication of the vast and varied forest wealth of the Province. In addition to exhibits of the fish found in Ontario's lakes and rivers, and of the animal denizens of the forests, there was a striking display of the woods, such as spruce, balsam and poplar in use in the pulp and paper industry. One very interesting exhibit dealt with the important subject of re-afforestation. The development of white pine, jack pine, Scotch pine and so forth, in various periods of their existence,—one year's, two year's growth, and so forth,—was very strikingly shown. Many first-rate exhibits emanated from paper firms. And an exhibit which attracted as much attention as any, by reason of its marked tastefulness of arrangement and floral decoration, was that of the Interlake Tissue Mills, of Merritton, Ont. This Company showed a very complete range of luncheon sets and outing specialties, as well as towels, wraps, etc.

Labor Day at the Exhibition, this year, was the only exception to the splendid weather which generally prevailed. But the rain did not arrive in time to interfere with the parade which was of enormous dimensions. A section of the parade, which was of more than ordinary interest this year, was that in which the striking printers figured. These took care that their banners and so forth should leave the public in no doubt as to the principle for which they conceive themselves to be on strike. Some of the speeches made, this Labor Day, by the way, were of a more extremist type than is usual in Toronto. An imported Labor M. P. from Great Britain made an able, but vehement, speech, in which he arraigned conditions, both in that and in this, with impartial bitterness.

Speaking of the striking printers, by the way, these are as confident as ever that they cannot be brought to the employers' terms. If they can hold out — and there seems no overt reason to doubt their financial ability so to do—and if the employers continue to train expert printers in their school—as they, in turn, profess that they will do—that it is just on the cards that the strike may end in rather unique fashion in not formally ending at all — if one may use such an Irishism. In other words, neither employers nor employees may give in. But, by degrees, the former may get the complement of workers they require by gradually filling the places of the strikers with the men and women they are training. At the same time, a straw may show which way the wind blows. And, if one or two things which have recently come to the writer's ears be correct, the striking printers have some grounds for their confidence that they are going to get "the long end of the stick," so to speak; at the moment, one can say no more than that. But interesting, developments may occur at any time.

The announcement that the Canada Paper Box Company intends to manufacture paper barrels has evoked a good deal of interest. The barrels which it is proposed to manufacture will be used for the shipment of flour, lard, sugar, butter and so forth. Arrangements are in progress for the installation of the requisite machinery for the manufacture of these barrels.

The Province of Quebec, which leads the other Provinces in the matters of forest protection, inspection and conservation, intends shortly to put into effect a scheme for reforesting three million acres of waste lands. The Provincial Department of Lands has opened a nursery at Berthierville and has commenced experimental plantations at Lachute among other places.

A despatch from Zurich states that, owing to the heavy demands made on the Hungarian bank note printing machinery, it wore out, and the Hungarian Government was forced to engage a large Zurich printing firm to turn out for it five billion kronen worth of notes. Before long, however, the Hungarian Government found that it was running short of paper. Consequently, it has just ordered another five billion kronen worth from the same Zurich firm.

At the moment of writing, there is much talk in pulp and paper circles of the likelihood that this week will see, in one way or another, a definite termination of the uncertainty that has prevailed so long in the affairs of the Riordon Company, Ltd. It is no secret that the creditors wish to have matters brought to an issue in one way or other. In fact, the writer was talking with one of them, the other day, who expressed his views very emphatically in this sense. A meeting of representatives of bondholders interests in the United States was held in Boston last Friday, and rumors of various kinds are rife as to the kind of action that was then decided on. The claim of Fuller and Company, the contractors, against the Riordon Company for nearly $1,000,000 has now reached the courts. It was necessary that this step should be taken by reason of the fact that this Company has a workman's lien against the Riordon concern, in order that this claim should be established. But the step in question, it is said, does not foreshadow further action by Fuller and Company of a kind inimical to the interests of the Riordon Company. It is said that the claims of other concerns with workmen's liens bring this class of indebtedness up to a total of $2,000,000 or thereabouts. Among the various rumors flying around, that to which most credence seems to attach is that the Company will surrender to the bond trustees, and that the latter will either sell the assets or will carry on the concern, for a time.

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paper in ammoniacal copper oxide, and exactly the same result was obtained in both cases.—A. P.-C.

A-15. Distinctive Tests for Oxycellulose and Hydrocellulose. C. G. SCHWALBE and E. BECKER. **Berichte,** liv, 545-50 (1921); **J. Soc. Chem. Ind.,** xl, 295A (May 16, 1921). Experiments were made with oxycelluloses prepared from cotton by the action of bleaching powder, permanganate, and hydrogen peroxide, respectively, and from purified cellulose (cellulose for nitration) by the action of bleaching powder, and a hydrocellulose prepared by the action of 5 percent sulphuric acid. The airdried material (1 Gm.) was mixed with water (about 50 Cc.) and titrated with N/100 sodium hydroxide solution. Litmus or phenolphthalein (at 80° Cent.) was used as indicator, the results being similar, but the end-point rather sharper with the latter. The titrations did not proceed very smoothly but were complete within a few hours (the acids are very sparingly soluble and only slowly neutralized). With bleaching powder oxycelluloses a very slight alkalinity was observed directly, due to the fact that the acids were largely present as their calcium salts; when the material was incinerated and the alkalinity of the ash added to the observed acidity, the expected values were obtained. It is thus shown that the "total acidity" of the oxycelluloses is very considerably higher than that of the hydrocelluloses or of the original materials. The presence of oxycellulose in overbleached cellulose was readily demonstrated in a similar manner. Hydro-and-oxycellulose may be readily distinguished qualitatively by mixing the preparations with distilled water and adding a drop of methyl orange. The liquid is colored yellow in nearly all cases but is reddish orange with certain oxycelluloses. A few Cc. of concentrated sodium chloride solution is then added, which leaves the color of the cellulose or hydrocellulose suspensions almost or entirely unchanged but gives a wine red coloration to the oxycellulose preparations. The method may be made quantitative by titrating back with N/100 sodium hydroxide solution; methyl red, however, should be used as indicator, since the end-point with methyl orange is indistinct.—A. P.-C.

A-15. Polysaccharides. III. Cellulose. P. KARRER and F. WIDMER. **Helv. Chim. Acta.** iv (1921); **J. Soc. Chem. Ind.,** xl, 342A (May 31, 1921). Comparison of the yields of cellobiose octoacetate obtained by treating cellulose, cellobiose methylcelloside, cellulose triacetate, and methylcellocide acetate with acetic anhydride and sulphuric acid under similar conditions, leads to the conclusion that cellulose must contain at least about 50 percent, and possibly more, of ready formed cellobiose complex. Hess and Wittelsbach's formula for cellulose [see **J. Soc. Chem. Ind.,** xxxix, 512A (July 31, 1920); also **Paper,** xxvii, 13 (Dec. 1, 1920), 14 (Dec. 8, 1920), 15 (Dec. 15, 1920)] cannot, therefore be accurate, as it indicates only 33 percent of preformed cellobiose.—A. P.-C.

A-15. Structure and Optical Activity of Cellulose. K. HESS and E. MESSMER, **Berichte,** liv, 834-41 (1921); **J. Soc. Chem. Ind.,** xl, 342A (May 31 1921). Levallois' observation that solutions of cellulose in ammoniacal copper are optically active is confirmed and the activity is proved to be due to the cellulose content. Under slightly varying conditions the values [d] = about —950° and —1000° are found, but accurate work is particularly difficult with the blue light. On the other hand, the "regenerated" cellulose is optically inactive in concentrated hydrochloric acid solution, as are also ethereal solutions of ethyl cellulose, aqueous alkaline solutions of xanthate (viscose) cellulose, and jellies of cellulose in neutral salt solutions. Cellulose presents, therefore, a marked example of "latent asymmetry," thus resembling mannitol, and it appears that ammoniacal copper hydroxide behaves toward it in the same manner as boric acid or borax toward the simpler carbohydrates.—A. P.-C.

A-15. Chemical Constitution of Cellulose. K. FREUDENBERG. **Berichte,** liv, 767-72 (1921); **J. Soc. Chem. Ind.,** xl, 342A (May 16, 1921). Cellobiose octacetate can be isolated in yield corresponding with the presence of 35 percent of cellobiose in the original material in a single operation when cellulose is treated with a mixture of acetic anhydride and concentrated sulphuric acid at a low temperature, the operation requiring about fourteen days. An indirect estimation of the loss of octacetate which occurs during the change makes it probable that cellulose is composed of cellobiose to the extent of more than 60 percent. This result is not in harmony with Hess's conception of cellulose (see **J. Soc. Chem. Ind.,** xxxix, 512A, July 31, 1920; **Paper,** xxvii, 13, 14, 15, Dec. 1, 8, 15, 1920) as composed of pentaglucosidylglucose residues, but is in agreement with the hypothesis that it is built up of cellobiose residues arranged in a uniform polysaccharide chain of ten or more members.—A. P.-C.

A-0. Molecular Structure of Fibrous Materials. R. O. HERZOG and W. JANCKE. **Umschau,** xxv (1921); **Chem. Zentr.,** xcii, II, 573 (1921); **J. Soc. Chem. Ind.,** xl, 342A (May 31, 1921). From experiments with Rontgen rays it is concluded that in plant fibers cellulose is present in a crystalline form disposed symmetrically with respect to the axis of the fiber. Artificial silk consists of an irregular felted mass of crystalline fragments of unchanged cellulose; artificial silk made from cellulose acetate is amorphous and consists of a mixture in which the cellulose acetate has undergone considerable degradation. Natural silk shows a crystalline character and a similar symmetrical structure to that of cellulose. Animal hair is amorphous and probably consists of two or more substances. Starch and pure fats are crystalline.—A. P.-C.

E-2. Acetaldehyde in Sulphite Alcohol. R. SIEBER. **Chem. Ztg.,** xlv, (1921); **J. Soc. Chem. Ind.,** xl, 363A (May 31, 1921). The quantity of aldehyde present in sulphite alcohol is proportional to the amount of sulphurous acid in the wort before fermentation; with an SO_2 content rising from 0.132 to 0.330 Gm. per 100 Cc., the aldehyde increases from 0.044 to 0.220 Gm. per liter of alcohol. The SO_2 content does not alter appreciably during fermentation, and the portion which is presumably combined with the aldehyde is resistant to oxidation by aeration.—A. P.-C.

E-2. Continuous Distillation of Sulphite Alcohol. Can. patent No. 208,356, SAMUEL E. OLIVER, Vancouver, B. C., Feb. 8, 1921. The desulphurized liquor, after concentration and fermentation, is delivered through fine apertures in a pipe extending over the bottom of a still. The contents of the still are maintained at a uniform evaporative temperature by electrical heating elements which are placed in the bottom of the still close to the liquor delivering pipe, and the depth of liquor is kept constant by means of an over-

flow pipe. The still cover is cooled by means of a spray, and the distillate is continuously removed from the still under conditions preventing re-evaporation. Claim allowed 3.—A. P.-C.

E-5. Lignin and the Sulphite Digestion Process. W. FUCHS. **Berichte,** liv, 484-90 (1921); **J. Soc. Chem. Ind.,** xl, 294-5A (May 16, 1921). Up to the present it has only been shown definitely that the lignin substances are not homogeneous and that their complexity is probably analogous to that of the proteins or carbohydrates of high molecular weight. Phenols are certainly present in them. They contain methoxy, hydroxy, acetyl, and carbonyl groups and also double bonds. Very little is known of the main portion of the lignin molecule and its structural relationships. The manufacture of sulphite pulp includes at least two separate processes, the detachment of the lignin substance from its natural form of combination in the wood and its subsequent conversion, possibly after further transformations, into soluble sulphur compounds. The nature of the former process is quite uncertain, since nothing is known definitely concerning the mode of union or admixture of cellulose and lignin. The second process may depend on the addition of sulphurous acid, and the double bond, to the carbonyl group or to the phenolic hydroxyl group; further, the possibility must be taken into account that the phenolic nuclei may behave in the sulphite process in their tautomeric form and therefore as unsaturated cyclic ketones.—A. P.-C.

K-2. Gas from Strawboard Waters. A. HERMANN. **Hot Gas,** xl, 131-5 (1920); **Chem. Ztg.,** xlv, **Rep.,** 32 (1921); **J. Soc. Chem. Ind.,** xl, 343A (May 31, 1921). A commission appointed by the Dutch government recommends storage in settling tanks followed by irrigation treatment or filtration as the best and cheapest means of purifying the effluent from strawboard mills. In a pulp mill employing this process it has been found that in the absence of air the effluent undergoes a fermentation caused by rodlet bacteria which, at an optimum temperature of 35° Cent., produce a gas containing 23 to 30 percent of carbon dioxide and 70 to 77 percent of methane. One volume of effluent evolves two volumes of gas, which is collected in bell covers, conducted to a gas holder and employed for the production of electric current for power and lighting in the mill; the surplus is taken by the local gas works and mixed with coal gas in the proportion of 25 per cent. An analysis of the gas showed carbon dioxide 24.7 percent, methane 64.3 percent, other hydrocarbons 0.6 percent, hydrogen 4.9 percent, oxygen 0.4 percent, nitrogen 5.1 percent; it contained traces of carbon disulphide but no hydrogen sulphide or carbon monoxide.—A. P.-C.

K-10. Method of Sizing Paper. Can. patent No. 208,404, THE FELCULOSE COMPANY OF AMERICA, Boston, assignee of HENRY MAY WHEELWRIGHT, Newton, both in Mass., and JOHN TRAQUAIR, Chillicothe, Ohio, all in the U.S.A., Feb. 8, 1921. The method of sizing paper which consists of treating the paper pulp in the beater with a mixture of rosin size and not over 20 percent of previously boiled modified starch and additional silicate of sodium and subsequently adding alum. The method of engine sizing paper which consists in mixing a solution of an animal colloid with rosin size, diluting it, and mixing it with the pulp in the beater to assist in the precipitation of the rosin in a colloidal condition in the beater and reduce the amount of rosin and alum necessary. Claims allowed 8.—A. P.-C.

K-19. Method of Breaking the Dried Coating on Sheet Materials. Can. patent No. 208,416, THE NASHUA GUMMED & COATED PAPER COMPANY, assignee of ADOLPH CHARLES VAN SLUYS, both of Nashua, New Hampshire, U.S.A., Feb. 8, 1921. Claims allowed 24.—A. P.-C.

L-0. Machine for Making Window Envelopes. Can. patent No. 208,362, CHARLES FRED. PFLANZE, St. Louis, Missouri, U. S. A., Feb. 8, 1921. Claims allowed 13.—A. P.-C.

R-5. German Competition in Brazil. World's Paper Trade Review, lxxv, 18. It is reported German exporters attempting to reenter the Brazilian market are quoting prices on some articles 60 percent below New York quotations and 65 per cent below London prices. —A. C.

R-5. Irish Paper Mills. World's Paper Trade Review, lxxv, 19. Large quantities of paper of the kind used in Ireland are being imported every day, no better in quality and no cheaper in price than the Irish product. It was suggested at a conference of the Irish manufacturers of wrapping paper, newsprint and cardboard, that the Irish public should see that the goods they buy are wrapped in Irish made brown paper. The same applied to newsprint and cardboard. This, it was represented, would speedily have the effect of increasing employment in the paper trade.—A.C.

R-5. Paper Prices and Education. Papir-Journalen, 6 (April 23), 1921. The Norwegian Association of Paper Makers states that the difference between the price of book papers and of newsprint is that, the paper costs 10 percent of the price of the book, while in the case of most newspapers the newsprint costs annually not more than one third to two thirds of the subscription.—P. B.

R-7. Three-Tour System. Paper, xxviii, 7 (April 20, 1921). Brief outline of the advantages of changing from the two-shift to the three-shift day with special reference to the pulp and paper mills, largely taken from a paper by ROBERT B. WOLF read at a meeting of the Engineers' Club of Philadelphia, Oct. 19, 1920. (**Monthly Labor Review,** U S. Dept. of Labor).A. P.-C.

R-11. Chemical Engineering in the Paper Industry. R. W. McKENZIE. **Can. Chem. Met.,** v, (March, 1921). Outline of the function of the chemical engineer in the pulp and paper industry, of the difficulties he has met in establishing technical control and efficient methods, and of breakdown of the old "rule of thumb" system. (See also **Can. Chem. Met.,** April, 1921, and May and June, 1921.) — A. P.-C.

R-0. War's Effect on the Paper Industry. RALPH B. PAYNE, **Paper,** xxviii, 7 (April 20, 1921). An analysis of conditions in the pulp and paper industry prior to the war (period 1909-1914) considering its size, the consumption of the various kinds of paper and the raw materials involved, as well as the development of the use of by-products; and of conditions up to January, 1917, showing the relation between the changed conditions and the European war.—A. P.-C.

R-0. Work of the Paper Division of the War Industries Board. Paper, xxviii, 7 (April 20, 1921). Outline of the work done by the paper division of the War Industries Board with a view to combating the rise in paper prices which began in the summer of 1918.—A. P.-C.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 10th Sept. — Alike from mills and from wholesalers, reports are to the effect that business in most lines, continues to pick up. The representative of one large mill, with almost unequalled facilities for viewing the field as a whole, today told the writer that it is his view that the situation is so shaping itself that the industry in Canada will, ere long, be in a position of considerably greater soundness and stability than in the days before the war. "During the war," he went on to say, "the demand for quick production was so imperative that it transcended all others. Largely from this reason, and from the concomitant fact that Labor, whether as regards mill construction, or mill operation, or in the woods, was paid at such inflated rates, to say nothing of the inflated cost of every kind of material, including chemical, insufficient attention was paid to the matter of production costs. These are now being looked to carefully. The industry's "joy-riding" days are over — and so much the better for its permanent stability. Henceforward, everything in the nature of production costs will be on a cold business basis — the only basis on which any industry can show satisfactory results of the kind that are destined to continue. Of course, some mills were erected at the very peak of inflated prices. With regard to these, it is difficult to see how the concerns responsible for their erection can make paying propositions of them very soon. But, with their exception, mills favorably located should enjoy a substantial measure of prosperity from the present time on."

Pulp.—The pulp market is still far from active. But the demand has somewhat improved during the last few days, and there is considerably more pulp moving. Groundwood pulp is selling at from $20 to $25 a ton. With regard to these prices, it must be borne in mind that, while they appear ridiculously low as compared with the peak price, at the same time they are very good as compared with pre-war prices — about double, in fact. So far as sulphitepulp is concerned, prices vary considerably. Fair average prices are probably $60 for strong unbleached and $80 for bleached. But buyers are not easily tempted to buy, unless they can get the pulp at an attractive price. Hence they are apt to make sure that they have got a rock-bottom price before closing a deal. The result is that when a price of $60 is named, a buyer will say that he has been quoted $58, or even $55 or lower, for unbleached, and so a deal may not be closed until he has run the whole gamut of those who have pulp to sell. It should be added that the improvement, which has been mentioned, in the demand for pulp is nearly all for unbleached. That for easy bleaching sulphite is almost nil. As regards the export of pulp to the United States, the action of European firms has put a crimp in this. Some German concerns are said to be putting pulp into New York at as low as $45 a ton ex dock for unbleached. Some pulp is also coming from Finland and from Sweden at a low figure, though possibly not so low as that just quoted. As has been said, it is difficult, in the domestic market, to maintain the prices of $60 and $80 for unbleached and bleached respectively. But it seems certain that there are no very large stocks on hand anywhere save in the hands of the manufacturers of pulp. Some of the latter appear to anticipate a substantial improvement in business within the next three months. But one of them told the writer that this was only likely if prices were reduced — otherwise there would be no improvement, he said, for some six months, anyhow. Adverting once more to the export trade in pulp, it should be mentioned that, pressed by the banks to liquidate stocks, Swedish mills are marketing. This fact makes competition unpleasantly acute at the present moment. But, according to the information which come to the writer, while they are marketing, they are not manufacturing. This fact is of importance, for it is likely, ultimately, to result in Great Britain purchasing a goodly portion of the product of Canadian pulp mills.

Newsprint.—The newsprint situation has undergone little recent change. But some big mills are quite busy and more than one can sell all the newsprint it can produce for the balance of the year. At the same time, the export outlook is momentarily none too good, owing to German and Scandinavian competition. Concerns in these countries are putting newsprint on the market in the United States at about $50 a ton, and this is resulting in a gradual reduction from the last-named country of Canadian newsprint.

Wrapping Papers.—A meeting of the Wrapping Paper Association was held on the 31st of last month, and, for the first time in many months, no question of a reduction in prices came forward at it. At the meeting in question, the writer is informed, a spirit of general optimism prevailed, and a reduction of prices was the last thing thought of. Indeed, there is an idea about that there will be an increase in prices at no very distant date. But, in spite of diligent enquiry on this head, the writer is constrained to admit that he has, so far, found nobody who will give away anything with regard to the prospects of this. With regard to the kraft aspect of the wrapping paper situation, it can be said, as a certainty, that the first week of this month witnessed an eminently satisfactory business, and that prospects are continually brightening. The increase in trade seems primarily due to the fact that stocks, in the hands of jobbers and consumers alike, have been suffered to get abnormally low, and, as a consequence, the former are now ordering a good deal more freely.

Toilets and Tissues.—At a meeting, on Tuesday of last week, of toilet and tissue makers, it was decided to reduce the price of both toilets and tissues by 10 per cent. Mills are busy in both lines. While wise men come from the East, large orders, so far as tissues are concerned, have been coming from the West of Canada lately. From that quarter of the country there has lately come an unprecedented demand for fruit wrap tissues.

Mr. William Whyte, Canadian representative for Ayers felts and Niagara wires has accepted the agency for the American Pulp Stone Co. of Littleton, W. Va.



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NEW YORK MARKETS.

New York, September 10. — (Special Correspondence).—Everything would seem to indicate that activity in the paper industry is finally and definitely on the increase. Reports coming to hand this week from various mill centres of the country tell of an appreciable quickening of manufacturing operations, and jobbers and mill agents in New York mostly say that business is commencing to show a healthy and steady growth. In other words, now that the Labor Day holiday is over, which in a great many ways is viewed as the end of the summer season, trading in various commodities appears to be expanding, and the customary autumn stimulation of business seems well on the way with the result that the paper industry is feeling the improved status of commercial affairs along with other industries.

Demand for paper of practically every kind continues restricted in character; that is to say consumers are buying only when in want of supplies. Nevertheless demand is quite healthy, and while general opinion in the trade is that demand will be slow in expanding during the next few months it is felt that there will be a consistent broadening of trade activity and that the demand that is due to develop for paper will be of the healthiest nature. A most encouraging feature is the gradual improvement in other lines of industry. The sharp rise in raw cotton prices, for example, has led to increased business all down the line in the cotton trade —mills are buying the raw staple, jobbers are purchasing larger quantities of cotton fabrics, retailers are laying in stocks of various kinds of cotton goods, while consumers have flocked into the market to buy in considerably heavier volume than in a long time. This same illustration might be cited in numerous other commodities, all of which means that industrial activity in general is on the mend in the States and that the consumption of paper, under such circumstances, is bound to increase, thus making for more business for paper manufacturers, jobbers and dealers.

Announcements from various quarters regarding a fixed contract price ranging around 4 cents per pound at mills on roll newsprint for delivery during the fourth quarter of the year have led to increased buying of print paper by publishers for forward delivery, and this branch of the market is substantially livelier than in recent weeks. As an instance of the improvement in newsprint, a statement issued by President Dodge of the International Paper Company several days ago, says that the mills of that company are steadily enlarging their production, and it is understood that practically all the paper now being made is being promptly shipped out from mills. Prices on spot deliveries of newsprint have sagged off to about 4 cents or slightly above that figure, and buyers appear more willing to absorb supplies than they have been in some time. One reason for the larger demand for spot lots of newsprint probably is that publishers are piecing out present requirements through spot purchases pending the change in the contract basis on October 1. Signs are not wanting also that consumption of print paper is on the rise, this being due to increased advertising and the resultant printing of larger sized papers.

Book papers are in better demand and steadier in price. Machine finished book seems fairly well stabilized at around 6 cents per pound at the mill, with some mills situated near to consuming centres accepting orders for small tonnage at this price f.o.b. delivery points. Reports generally tell of book mills running at larger capacity and of manufacturers finding a broader outlet for their product.

Coarse papers are moving in comparatively good volume, with kraft wrappings in fair demand and with tissues meeting a ready sale, especially coarse tissues. Writing paper mills are gradually increasing their operations and are shipping out larger amounts of paper than in some months, while cover paper manufacturers report a steadily expanding call for their product.

Box board mills adjacent to New York and elsewhere in the East are running very nearly full and have been on this schedule for the past several weeks, indicating that demand for boards is good. There is still very keen competition among board makers for business, however, and this keeps prices down. Plain chip is quoted at an average of $30 f.o.b. New York, while news board is selling at around $32.50 per ton.

GROUND WOOD.—Ground wood is easily holding its market position, and although prices fail to show any material advance, there is a firm tone in evidence and sellers seem to be taking a more bullish view of conditions every day. No one is pressing buyers to absorb pulp in any large quantity, and the firmness with which grinders and dealers hold unsold supplies of pulp is unmistakably the feature of the present market. Most current quotations range around $30 per ton at producing mills on prime spruce ground wood freshly ground for prompt delivery. Now and then a sale is reported at slightly below this figure, $29 and even $28 being mentioned in some quarters, but only limited amounts of pulp are to be had at these levels. Grinders are in a bad way for want of water to run their plants and production of mechanical pulp is at a low point, which accounts for the bullish feeling among those on the selling end of the trade.

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CHEMICAL PULP.—The chemical wood pulp market displays a decidedly steadier undertone. No advance has been recorded in prices, such business as is done being at about previously reported quotations, but selling pressure has let up, particularly from import circles, and the general complexion of the situation appears to be changing for the better. The agitation against the dumping of pulp into the United States by European producers undoubtedly is one of the principal reasons for this. Importers report having to put up a bond on nearly every lot of pulp brought in from Germany and Sweden at present, which obviously makes them a great deal more cautious in bringing supplies across the Atlantic. Moreover, indications are that the great bulk of spot stocks of foreign pulp in this country has been liquidated, and this tends to make for a firmer market tone as importers are less inclined to grant further price concessions to effect sales.

Foreign bleached sulphite is quoted at between 3.75 and 4 cents per pound ex-dock on the No. 1 grade, and around 3.50 cents on No. 2 quality bleached. Unbleached sulphite of foreign origin is selling here at an average of 2.50 cents a pound on the dock, while Scandinavian kraft pulp has firmed up slightly in price to around 2.25 cents, with one sale reported during the week at 2.40 cents. It is stated that one of the leading domestic manufacturers of bleached sulphite who is now quoting 4.25 cents on No. 1 pulp has intimated that this price will be advanced on September 15. Domestic pulps are still more or less neglected by paper mills although a steady contract movement continues, while occasional spot sales are being accomplished.

RAGS.—Despite the fact that most other kinds of papermaking material show improvement both in activity and price, rags remain in a quiet market condition. There has been a little broadening of demand for some grades of new cuttings, and as was expected, dealers in frequent cases have marked up prices on these kinds of rags, but old rags hold at unchanged price levels with the tendency, if anything, still downward. New No. 1 white shirt cuttings are now held by dealers for at least 8.50 cents per pound at shipping points, while new blue overall cuttings are quotably higher at 5.50 cents, new unbleached muslins at 7.50 cents, white lawns at 8 cents and new light silesias at 5 cents. Old No. 1 repacked whites are selling to mills at from 4.50 to 5 cents per pound at dealers' points, and repacked thirds and blues at 1.50 to 1.75 cents, depending on the packing. Roofing rags are in about the same position with No. 2 satinets bringing no more than 75 cents per hundred pounds at shipping points and with most sales made at a little under this figure.

PAPER STOCK.—Prices on old papers continue to rise and there have been several sharp advances recorded this week. The strengthening position of the market seems due more to a scarcity of material than to the buying by consumers, but the fact remains that values are on the ascendency. Old books and magazines are exceptionally firm and dealers want at least 1.10 cents a pound for No. 1 books free from ground wood, with a good many quoting above this level. Shavings also are firm at quotations of 2.40 to 2.60 cents on No. 1 soft whites and around 3.15 cents on No. 1 hard white shavings. Old kraft paper is held for 1.70 cents a pound and higher, white blank news cuttings at 1.60 cents, print manilas at 85 cents a hundred, folded newspapers at 50 to 55 cents and No. 1 mixed paper at 35 to 40 cents.



Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., September 22, 1921. No. 38

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

PULPWOOD INVENTORIES.

There seems to be an inclination, in view of the general business situation, to mark down inventories of all supplies and materials in hand at pulp and paper mills. This is a logical step to take if inventories, at the time prices of raw materials were mounting, were marked according to replacement values. The calculation of cost of production, and consequently the value of the finished product, on costs of raw material at the time of the sale of the product is generally accepted as correct accounting. It seems, however, that in the case of pulpwood there are two factors which make this item somewhat of a special case. In the first place, there is no immediate turnover of this raw material; it takes from one to two years to bring it from the forest to the mill, and obviously it cannot be immediately replaced no matter what the current market might be. In the second place, it is a raw material whose initial or potential value is constantly increasing. It is more than probable that this aspect of the situation is not given sufficient consideration by companies which have made, in some cases, rather drastic cuts in the values placed on stocks of pulpwood.

When the boll weevil destroys a large percentage of the cotton crop, an unfavorable season cuts the corn crop severely, or extensive injury is done by grasshoppers to other grain, the part of the crop that remains immediately is given a greatly increased value. A striking present instance is the failure of the potato crop, with consequent high cost of this staple article. A little thought will show that forest fires, insects, and storms, are annually destroying more wood than is being gainfully consumed, and each of these agencies of destruction accounts for a loss in excess of the annual growth of the trees that remain. Furthermore, fires not only destroy mature standing timber, but wipe out the insurance of the future by consuming young growth and burning out the soil. Insects and storms, by killing and blowing down trees, create not only an increased fire hazard in addition to the loss of the wood, but the tangled mass of logs and limbs makes it more expensive to carry on lumbering operations in such areas. The presence of this debris is also one of the greatest obstacles to successful fire fighting.

The pulp and paper mill is foolish which considers its stock of pulpwood merely as the block pile in the mill yard. We feel that it is no more correct to consider the pile of wood in the yard apart from what remains in the forest than it would be to consider the coal in the boiler house apart from that in the storage pile. When one considers the very rapidly diminishing areas of available forest and the unchanging law that scarcity of supply inevitably enhances the value of available material, it seems rather silly to make any appreciable cut in the inventory value of a block pile unless, perhaps, a portion of the wood represents an unduly high cost because of a temporary condition of extremely high wages. Our supplies of wood in Canada are very much like the supplies of anthracite coal in the United States. While there is sufficient to meet the present demand for many years, the end is in sight, and those who own the mines are wise enough to realize that the way to make them last longer is to make the coal cost more. Our forests are worth more to us every day.

Not only should wood-using industries realize the increasing value of standing forest, but our governments should be particularly awake to the situation.

Two provincial governments have been urged by operators to decrease the stumpage fee, and one province has seen fit to grant this concession on the strength of a promise that, in view of the unemployment situation, lumbering operations would be carried on more extensively. Personally, we fail entirely to see where, in the face of well stocked lumber yards and with wages of woodsmen well below ordinary figures, a concession of a dollar or so in stumpage fee will be a very great inducement to extend operations in the woods. The decreased cost of wages alone ought to make sufficient difference in the ultimate cost of lumber to provide any necessary inducement for the wider purchase of building materials. To our mind, the government which, in face of the world situation regarding timber, will deliberately reduce the price of stumpage, is not acting in the best interests either of the people or even of the very wood using industries that seek to write down the value of the inventory of this great public-owned raw material.

WHAT IS STRAW?

Canada is one of the great grain growing countries of the world, and every year sees many acres added to the valuable agricultural lands of the Dominion. Much of this newly settled country, and the areas which will be developed in years to come, are now covered with trees. In the clearing of his land, the settler expects to market the wood very largely as raw material for

our pulp and paper mills. Every farm, therefore, which is established, decreases to that extent for all time, the tree producing acreage. It is beginning to be a question of great concern whether we are not depleting our forests both by virtue of settlers clearing and our present methods of forest management at so rapid a rate that a substitute, or at least, a supplementary, material must soon be found for the manufacture of paper. Many experiments have been carried out and some materials have found successful application in the industry. We might mention the recently developed processes for making pulp from cotton linters and from sawgrass.

There is, however, a vast quantity of material wasted every year both in Canada and the United States which has for a long time been successfully used in the manufacture of paper and boards. Straw is the material. It is usually looked upon as rather poor stuff, suitable only for making cheap boards and coarse brown wrapping paper. It is possible, however, as well as economical, to prepare cereal straws in such a way that they may be successfully utilized in high grade papers. In a recent issue of this magazine, Mr. Martin L. Griffin pointed out the wide range of adaptability of straw and predicted an early revival of its use as a major raw material for paper making. Some months ago, an article by Mr. Ommanney described investigations which showed the value of flax straw for high grade papers. In connection with that article, we pointed out the possibility of such mixtures of flax and cereal straws as would meet almost any requirements for the manufacture of paper and boards.

On another page of this issue will be found the second instalment of an article describing a careful investigation by Prof. Lloyd of McGill University regarding the structure of cereal straws. We have no doubt but that this article, to which Mr. Griffin's contribution served as an introduction, will form a basis for further research into both the properties and the utilization of these various straws as a source of paper making material. On the completion of the series, the article will be available in the form of a reprint.

LAURENTIDE DIGESTER BLOWS UP.

Readers of the Pulp and Paper Magazine will recall the disastrous accident which occurred several years ago when one of the huge digesters of the Laurentide Company exploded. We have been advised that another digester of the Laurentide Company has ceased to operate. This time, fortunately, there was no loss of life, but we are sure that the people of Grand 'Mere will greatly miss the weekly appearance of the eight page paper which has so successfully functioned for several years as a factor in the life of that place. As for ourselves, we cannot quite imagine now how we are going to find out what Ed. Wardle says when somebody pinches his tea (we believe that is what golfers call an accessory of the links), when George Chahoon has been conferring with "The Bulls" over at the farm, or when Ellwood Wilson goes up in the air over some forestry proposition. The explanation of the matter is that the management has decided, for the present, to discontinue the publication of the "Digester," in view of the necessity for eliminating avoidable expenses.

A great, though unappreciated, conservationist was lost to Canada in the death of Senator W. C. Edwards.

MANY NEW PULP MILLS PROJECTED.

Thirty-nine pulp manufacturers are planning increased capacity or new mills in the United States and Canada, according to a bulletin to members of the American Paper and Pulp Association, based on a survey by Secretary H. H. Bishop of the Pulp Manufacturers Association.

Twenty-seven others have discarded or held in abeyance plans for increased capacity or for new mills. Of the companies planning construction, twenty-three are in the United States and sixteen in Canada. Of those who have deferred or abandoned enlargement plans, fifteen are in the United States and twelve in Canada.

"This indicates essential optimism in the paper industry," said Dr. Hugh P. Baker, Secretary of the American Association, the federation of the various branches of the industry in the United States, "in view of the fact that the American market is now being deluged with not only paper, but pulp, at prices lower than the product is being sold for in the countries of origin, indicating that systematic dumping is in progress."

The tabulation of projected construction indicates that compared with the present capacity, a production of 75 to 80 per cent of the theoretical capacity of the present and new mills will be all that the market would normally absorb. The increased production will be distributed as follows, the figures given being theoretical daily productive capacity.

United States and Alaska.

	Mechanical	Sulphite	Kraft	Soda
January 1, 1921 ...	7,825	5,700	904	1,846
Addit. during 1921	210	90	160	195
Total Jan. 1, 1922 .	8,035	5,790	1,064	2,041
Addit. during 1922	450	60	....	....
Total Jan. 1, 1923 .	8,485	5,850	1,064	2,041

Canada.

	Mechanical	Sulphite	Kraft	Soda
January 1, 1921 ...	5,541	3,060	776	26
Addit. during 1921	600	220	15	..
Total Jan. 1, 1922 .	6,141	3,280	791	26
Addit. during 1922	200	50	...	..
Total Jan. 1, 1923 .	6,341	3,330	791	26

Estimates for 1921 production are that the total production will be about 30 per cent more than the consumption of pulp in 1920.

If you have a good job, don't lose it. Study, learn and advance as fast as you can. Keep moving up, for if you are not moving up, it is quite likely you are silently slipping out. And the worst of such a situation is, you seldom know it until you slip out.

The Structure of Cereal Straws

By FRANCIS E. LLOYD, F.R.S.C. McGill University.

(Continued from last issue.)

Gross Internal Structure.

In most grasses the stem, excepting at the nodes, is a hollow cylinder of almost geometrical regularity. The exceptions in which the stem is a solid mass of tissue are, conspicuously, the sugar cane, Indian corn and a few others. The hollow joints of bamboo, used as flower holders, and in the tropics as water holders, flowerpots, etc., are familiar examples of the hollow structure; still more so the lemonade straw.

bending. The false nodes and leaf sheaths incidentally

As a mechanism possessing the maximum strength relatively to a minimum amount of material it approaches perfection, that characterizing the hollow column. Owing to the properties of the materials, which have a high modulus of bending, the column is not easily broken even under a transverse strain. The terminal internodes of the rye serves as an excellent example. One 55 cm. long, 0.7 mm. in diameter at the upper end, and 1.2 mm. at the thickest point and weighing only 0.25 grams could support 5 grams when supported 10 cm. from the base, with bending through an arc of 15 degrees in the dry condition. The walls of the cylinder were only 0.2 mm. thick. It is of course only when the strength available comes within the ordinary range of necessity that grass stems become useful for the inherent mechanical properties, the bamboos being in this regard notably efficient. Even grain straws however, meet special needs, but aside from ordinary experience.

Each internode tapers slightly towards the base, and is generally somewhat constricted just below the node. The terminal internode however tapers gradually from its thickest part, which is nearer the base, to the ear (inflorescence). The entire upright stem, or straw, consists of three to four internodes in barley, oats and rye, in wheat three, excluding the shorter internodes which occur within 6 inches of the ground. The differences in the length of straw are due chiefly to differences in the length of the internodes, and less to their numbers. The relative lengths and total lengths, based on the measurement of ten straws of each grain are shown in the table. (figure 2.)

TABLE.

Species	Total length of straw	Length of internodes Top	2	3	4	5
	cm.	cm.	cm.	cm.	cm.	cm.
Barley	56	28	17	8	3	..
Oat	91	49	24	16	2	..
Rye	149	53	46	28	12	10
Wheat	69	42	22	5	..	..

The measurements for the bottom internodes in the above samples are however only partial, since in reaping, a basal portion of the straw is left. Measurements of complete straws based on samples grown at MacDonald College, and at Ottawa, in pure, or nearly pure cultures, gave the following measurements:

	Total	Top	2	3	4	5	6	7
Barley—								
"Chevalier"	79	26	19	12	10	6	3	3
	103	34	24	17	14	10	4	..
Oats—								
"50 lb. Black"	81	41	17	11	7	4	1	..
"Banner"	84	41	17	13	8	4	1	..
"Alaska, 712"	95	41	22	15	9	6	2	..
"Banner"	98	42	20	15	10	7	4	..
Rye—								
Common	111	42	32	21	13	6	2	..
	112	39	32	20	13	6	2	..
Wheat—								
"Marquis"	104	50	21	11	8	4	..	..
"Marquis"	93	52	21	11	7	2	..	..
"Red Fife"	105	58	23	12	8	4	..	..
"Pringles's Champ"	84	50	17	9	6	2	..	..

It is evident that, due to both racial characters and to "place effect" it would not be easy to identify the grains merely by casual measurements of the straws. Nevertheless certain features emerge from the above figures which serve as a guide of some value, especially in the relative lengths of the uppermost internodes. For example, the terminal internode in wheat is 50 per cent. of the whole straw in length, and over twice that of the sub-terminal internode. Similar comparisons bring out equally useful ratios, but it is unnecessary here to discuss them further. We may say

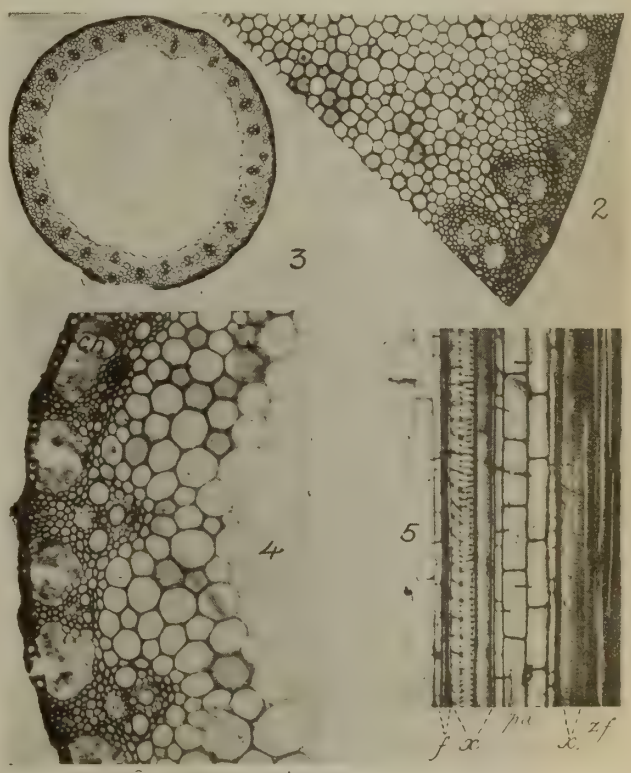


Figure 2. — Sector of a transverse section of a wheat stem taken just above a node, where the fistula is not developed, and the stem therefore solid. × 65.

Figure 3. — Transverse section through an internode of barley, showing the fistula, and the bundles in the parenchyma. × 6.8.

Figure 4. — Sector of a transverse section through the upper part of the terminal internode of wheat. The fiber layer is interrupted by the chlorenchyma spaces (Ch) which underlay the stomatal zones in the epidermis. × 97.

Figure 5. — A longitudinal section of the stem of barley. The fiber layer (zf) appears quite dark on account of the small diameters of the cell lumina. The ring and spiral thickenings of the wood of two bundles (x) can be well seen. A secondary series of wood vessels can be seen on the right of the annular vessels of the left hand bundle. × 65. pa. parenchyma; f. fibers.

however that it would be possible, given the samples of straw, to fix upon the grain with fair certainty by such measurements as these alone, and in conjunction with other measurements, to arrive at practical certainty.

We note that wheat has one less internode in the straw than the others. About one in ten rye straws shows part of a seventh internode. The thickness of the various straws bears no relation to the stature.

A conspicuous feature of the grass stem and leaf already referred to is the fine longitudinal ribbing and alternate "fluting", especially obvious in straw which still shows the green color, though it can be seen quite readily by the deep yellow color after the green has faded away. This appearance is due partly to the presence of low longitudinal ridges, and partly to the structure underlying the outer tissue, the epidermis. This relation will be made clear later.

Anatomical Structure.

A glance through the microscope at a bit of straw, however prepared, will show at once that the mass is made up of a large number of small units, each composed of a wall enclosing a space which may be either empty or contain the remnants of various substances which were important during the life of the plant. It is convenient to designate these units by the term cells, as originally used. (4)

Structural groupings of cells of similar size and shape are called tissues. In the immediately following paragraphs the form and dispositions of the cells and tissues will be described. It will be convenient to begin by examining the structure of a stem as seen in transverse sections.

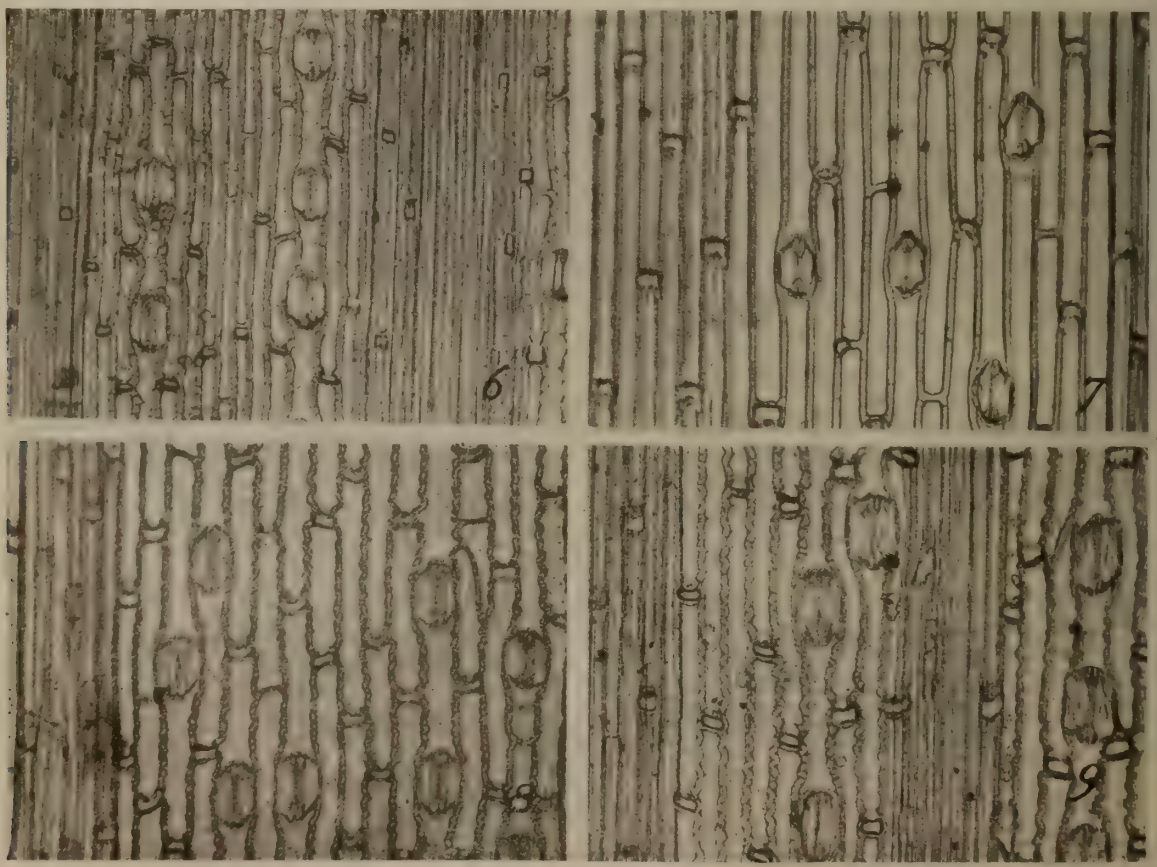
THE STEM.

If such a section is taken just above the node, where the stem is not hollow, the following structure will be seen (figure 3).

The section is nearly circular, and appears made up of a mass of round cells constituting the parenchyma, the largest in the middle, and grading in size toward the edge when they meet with a much denser lot of tissues. These are evidently arranged in groups of cells (the fibro-vascular bundles) of different sizes, between which the parenchyma extends toward the periphery of the section. There are apparently two, but strictly speaking more than two, circular series of fibro-vascular bundles, the inner of larger ones, and an outer of smaller ones, paced quite close to the surface of the stem. Between the bundles of the outer series the cells are very small, and as will be seen, make up a layer of fibers (bast). (*cf.*) figure 6).

Bounding the whole is a single layer of cells of small size and approximately quadrangular in transverse section constituting the epidermis. On comparing with a section (figure 4) from a somewhat higher level in the internode where the stem is hollow and where the tissue arrangement is best displayed, it will be seen that here the structure differs from that just at or above the node chiefly in the circumstance that the parenchyma in the middle has broken down thus leaving the space (fistula). At a still higher level it is seen that there may be an interruption of the dense mass of small-celled tissue just beneath the epidermis, by stretches occupied

(4) "Cell" was used by Robert Hooke in 1665 for the cavities seen in cork. The term has now a more fundamental significance, being applied to the living matter which, in plants, builds up a cellulose skeleton by which the form of the plant is maintained. There is no living matter present in "straw", which is merely the relatively indestructible skeleton of the erstwhile live plant.



Figures 6-9. — The epidermis viewed en face of the stem (upper part of a lower internode) of barley, oat, rye and wheat resp. × 174.

by very thin walled and loosely arranged cells (the chlorenchyma) which, when the plant is alive, contain the green coloring matter (figure 5).

If now a section running lengthwise the stem is examined, (figure 6), it will be seen at once that the appearance offered by the transverse section gives a totally inadequate conception of the shapes of the constituent cells, many important details not appearing at all, especially in such small objects as the grass stem, the total thickness of which is0.5 mm. or less in thickness. However, by means of maceration (in chromic acid for example) the cells may be set free from each other and thus examined. With the additional help of this method we may examine each tissue in turn beginning with the epidermis.

THE EPIDERMIS (Figures 7-14).

Examined *en face* the epidermis is seen, in general, to be composed of longitudinal zones of more or less elongated cells with undulating walls overlying the green tissues beneath, alternating with narrower zones of similar but longer cells with straight walls, and with narrower lumina.

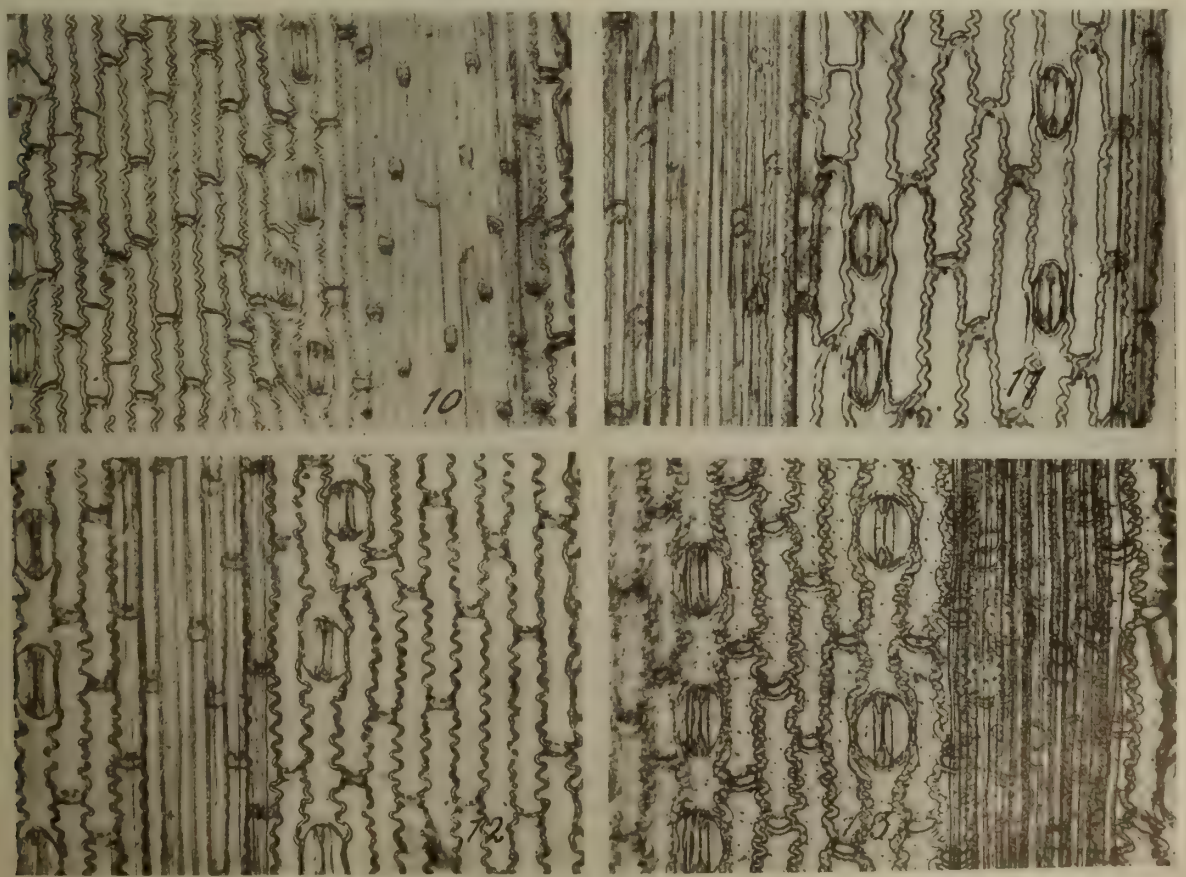
The long cells are interrupted frequently by the so-called "dwarf-cells", which occur usually in pairs placed longitudinally, but may be either single, in threes or in fours. Of the pair, one cell is thin-walled and stains readily in the manner of the epidermal cells in general. This, when there is but one dwarf-cell in a position, is the cell which may assume the form of a trichome usually shaped like a cat's claw. The other is thicker walled, usually, and the walls are strongly silicified. Wiesner (1900) states that this is the case and Hoehnel (through Haberlandt, 1909, p. 105) represents them as single. Only one of the pair however, presents this character. The representation by Hoehnel seems to be referable to the circumstance that sometimes the cells in question are very small and sheared upon each other so that they can be resolved microscopically only in depth and not transversely (figure) .In barley especially they are very small and difficult to resolve. In wheat however the silicified cell may be quite large relatively.

The long cells of the epidermis are interrupted also by groups of four cells forming the stemata. These are organs which are capable of forming openings through which gasses can pass into and out of the

These are organs which are capable of forming openings through which the air can pass into and out of the stem (figures 31a-d; 16). The four constituent cells are arranged in the grasses in a transverse row. The two adjacent ones, the "guard cells", are slender, and have a slit between them which opens and closes in life according to physiological conditions. The outer two cells are the accessory cells. The relations are best understood by examining a transverse section (figure 16).

Epidermis of the stem. The epidermis of the stem and of the leaf both present similar fundamental features as just described. They are, however, sufficiently different in details as to demand separate examination. (figures 7-10).

It is practically impossible to fit a single description to the epidermis of the stem for the reason that it shows marked differences in different portions of the internode. In the lower portion, the cell walls (in wheat, e.g.) are quite straight and thin, the dwarf cells are longer and very simple in structure. The stomata are few in number and less differentiated. In the upper portion, on the other hand, especially where the inter-



Figures 10-13. — The epidermis viewed en face of the lower (outer) surface of the leaf sheath of barley, oat, rye and wheat resp. × 170.

node is not covered by the leaf-sheath, the cells have walls which are thick and undulating, and they occur in longitudinal zones alternating with zones of cells with straight walls. The dwarf cells are here strongly compressed longitudinally (figure15), and the stomata well developed. Indeed so much difference is there that it is difficult to recognize that one is dealing with the same stem. It will be readily understood that it becomes much more difficult to distinguish between different kinds of straws if only the epidermis from the lower portions of the internodes is regarded. Such characters as may enable one to make these and similar distinctions are found only in the upper part of the internodes.

Epidermis of the leaf (figures 11-14). In straw, in the ordinary commercial sense, the leaf blades are present in such small quantities as to be negligible. They are broken off in threshing and become as chaff. The leaf sheaths however are practically always adherent and form part and parcel of the straw and constitute a

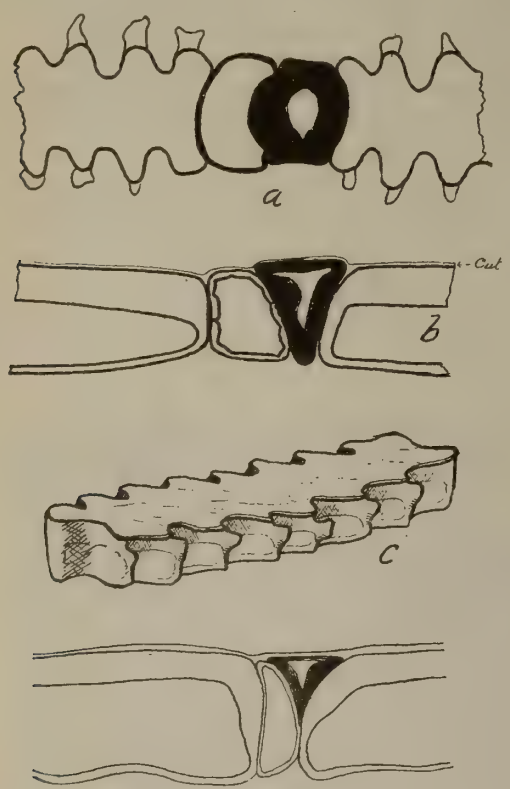


Fig. 14. — Diagrams of the dwarf cells and of an epidermal cell (wheat). **a**, dwarf cells, **en face**; **b**, lateral view; **cut**, cuticle; **c**, epidermal cell in perspective; **d**, dwarf cells of barley.

not inconsiderable proportion of straw paper pulp. The epidermis is moreover more evenly and fully developed throughout the whole length of the leaf-sheath. The longitudinal walls of the longer cells of the outer surface are thicker and usually strongly undulating, the dwarf cells may be developed into short protruding hairs (wheat) and are generally in twos (figures 10 and 14). The epidermis of the thin leaf margins and of the inner surface of the leaf-sheath is very thin, as are the walls of the cells. They are here also without undulations, and dwarf cells are relatively few. The relative amount of epidermis from the leaf-sheath as compared with that of the stem, together with its uniform character makes it an important means for the identification of the kind of straw, especially in the form of pulp.

(To be continued.)

NEW CLUB HOUSE AT LA TUQUE.

The Brown Corporation have shown a wonderful example to manufacturers in the building of a club house at La Tuque. The erection of the building has recently been completed and we now await the day when the doors will be opened and the business of enjoying oneself may commence.

The plan of the building is in the form of a broad T of which the top stroke is the point 101 feet in breadth. A basement extends under the entire building and contains a swimming pool 20 x 60, bowling alleys, locker room, showers, lavatories, boiler room, etc. The walls and ceilings are all white and the rooms mechanically ventilated, so altogether this basement is, unlike most basements, attractive.

On the first floor level, at the vertical stroke of the T is the gymnasium, which has a stage at one end and a gallery surrounding the designed auditorium, which is primarily for spectators at basket ball games, but will be an asset on other occasions.

The front part of the building has three floors above the basement. On the first floor in the centre there is a spacious entrance hall with arches at each end leading to the billiard room and reading room, respectively. Behind these rooms on one side there is the ladies' room and on the other the boys' department. One of the features of the club is that the Boy's Department can be isolated from the rest of the club both on this first floor and in the basement where are the boys' locker room and showers, etc.

On the second floor there is a banquet room and three club rooms, which can be opened to form a large dancing hall when desired.

On the third floor is an apartment for the janitor and his family and seven bedrooms which will be occupied by visitors and perhaps some of the lucky bachelors employed by the company. Kitchen accommodation has been provided to supply the needs of the ladies' afternoon tea parties on the first floor and the banquet room on the second floor.

The exterior of the building is in red brick with white trimmings and conforms to the style of the well known Colonial house—a style admirably suited to the purposes of the building and its surroundings. The interior is beautifully finished, the woodwork in Canadian ash stained and waxed to a medium brown blending successfully with the harmonious tones of the rural tinting, which in itself will be an education to the members who have an idea about how their houses should be painted,

The Brown Corporation has realized the immense educational, physical and social opportunities which a club of this kind has to offer to a population which for five months in the year at least, is bounded on all sides by a wilderness which confines the amusements of the people to the immediate environment of their houses.

The late Philip D. Armour said responsibility could not be forced on anyone —he must assume it himself. There is a lot of truth in this statement. A successful executive does not wait for somebody to come along and force him to accept the responsibility of his position —he assumes it. A foreman who gets into the habit of waiting for someone "higher up" to point out to him what to do, and what not to do, will be a failure. A man who is afraid to go ahead and use his own judgment will never make a leader. — The Andersonian.

Specifications for Limestone and Lime for Sulphite*

1. GENERAL

(a) Manufacture of Sulphite Pulp.

The manufacture of pulp for paper making from wood, by means of the sulphite process, consists of the following operations:

(1) preparation of the wood,
(2) preparation of the cooking liquor,
(3) cooking of the wood,
(4) washing and screening the pulp,
(5) bleaching the pulp, and
(6) preparation of the finished pulp for shipment.

The use of limestone and lime in the manufacturing process occurs in the preparation of the cooking liquor. This liquor is produced by the reaction between sulphur dioxide and limestone or lime and the two absorption methods in common use are called the tower system and the tank system. The liquor is essentially a calcium or calcium and magnesium salt of sulphurous acid and its function is to affect the non-cellulose part of the wood in such a manner that, in the washing and bleaching process, nearly pure cellulose may be obtained.

(b) Use of Limestone or Dolomite in the Tower System.

The tower type of absorption system consists of one or more towers varying in height from 20 feet to 150 feet and charged with limestone or dolomite resting on gratings. A stream of water, with or without the addition of reclaimed liquor, trickles over this stone, while the sulphur dioxide enters at the bottom, rises and acts upon the moist stone and is absorbed by the downward flowing film of water.

(c) Use of Lime in the Tank System.

In the tank or milk of lime system, the base is in solution or suspension in a series of tanks, equipped with suitable agitators. The sulphur dioxide is forced or drawn through these tanks successively. In some cases, the tanks are built on top of each other in the form of a tower. The contents of the first tank are drawn off when the liquor has reached a certain strength (3.5 to 6 per cent total SO_2) and the contents of the second and third tanks progress to the first and second tanks respectively. The third tank is again charged with fresh milk of lime.

(d) Discussion of Use of Calcitic and Dolomitic Stone and Lime.

There is some difference of opinion in this country as to the relative merits of calcitic and dolomitic stone and lime for use in the two absorption systems. The difference in practice in the various pulp mills does not seem to be based on accurate data. As a result of a summary made during the war, the following conclusions may be drawn:

(1) In the tower system, calcite stone is desired, due principally to the fact that when dolomitic stone is used the calcium carbonate goes into solution first, causing the stone to crumble and leave a sludge. For this reason, in a tower system using dolomitic stone, it is necessary to have the grates raised 40 to 50 feet and they require frequent cleaning. One mill is using and recommends dolomitic stone. However, most of the mills are using a calcite stone and, in fact, several were using marble having a calcium carbonate content of 98.5 per cent. It cannot be said, however, that dolomitic stone cannot be used in the tower system, but it is not the most common practice.

(2) In the tank system, a lime high in magnesium is desired, due to the fact that the magnesium salts are soluble, while the calcium salts are not so soluble and have a tendency to clog the system. But due to variations in tank systems, it is probable that a calcitic lime would give good results in certain instances.

In view of the difference in practice in American pulp mills, as briefly outlined above, specifications are given for both kinds of stone and lime.

(e) Definitions.

Limestone consists essentially of calcium carbonate. Dolomite consists essentially of calcium and magnesium carbonates when the proportion of the latter does not exceed 45.5 per cent.

Quicklime is the product resulting from the calcination of limestone. It will slake when water is added to it and this slaking is accompanied by an evolution of heat and an increase in volume.

2. REQUIREMENTS.

(a) Quality.

The quality of the stone or lime should be reasonably uniform and in the case of the dolomitic stone or lime, the proportions of magnesium and calcium should be kept as nearly constant as possible.

(b) Composition.

In view of the fact that various systems may use different grades of stone or lime, the requirements of these specifications are so given that they will meet the conditions of the pulp mills in this country. The maximum and minimum quantities are given in the following table:

Ingredients	Calcite Stone		Dolomite Stone		Calcite Lime		Dolomite Lime	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Calcium oxide	..	54.0	..	30.2	..	93.0	..	56.0
Magnesium oxide	1.5	..	..	18.8	2.5	..	..	35.0
Impurities	1.5	..	1.5	..	2.5	..	2.8	..
Organic matter ..	0.5	..	0.5	..	0.5	..	0.5	..

(c) Impurities.

The impurities present in a limestone or lime must be evenly distributed throughout the mass, and must not be concentrated in visible strata or nodules which would clog the grates.

(d) Packing.

Limestone is shipped in bulk in carload lots. Quicklime is shipped either in bulk or carload lots or barrels holding 180 pounds net or 280 pounds net each.

(e) Marking.

Each package, or each carload of bulk material, shall be legibly marked with the names of the consignor and consignee and with some means of identifying the particular contract on which the shipment is made.

3. SAMPLING AND TESTING.

(a) Sampling.

The purchaser will bear all expense of sampling and testing. When limestone or quicklime is shipped in bulk, the sample shall be so taken that it will represent an average of all parts of the shipment from top to bottom, and shall not contain a disproportionate share of the top and bottom layers, which are most subject to changes. The sample shall comprise at least 10 shovelfuls taken from different parts of the shipment.

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* These are tentative recommendations of the U. S. Bureau of Standards. Readers are asked to co-operate in this work by sending to the Editor any suggestions or criticisms.

The total sample taken shall weigh at least 100 pounds, and shall be crushed to pass a 1-inch ring, mixed thoroughly, and "quartered" to provide a 15-pound sample for the laboratory.

When quicklime is shipped in barrels, at least 3 per cent of the number of barrels shall be sampled. They shall be taken from various parts of the shipment, dumped, mixed, and sampled as specified in the above paragraph.

When sampling quicklime, it is essential that the operation be conducted as expeditiously as possible, in order to avoid undue exposure of the material to the air. The sample to be sent to the laboratory shall immediately be placed in an air-tight container in which the unused portion shall be stored until the shipment has been finally accepted or rejected by the purchaser.

The sample may be taken either at the point of shipment or at the point of destination, as agreed upon by the contracting parties. If it is desired to take the sample at point of destination, due allowance must be made in order that the lime manufacturer shall not be penalized for the carbon dioxide absorbed in transit.

(b) Testing.

The following directions are a brief summary of the analytical methods which are recommended. For more complete information on this subject references should be made to The Analysis of Silicate and Carbonate Rocks, by W. F. Hillebrand, United States Geological Survey, Bulletin No. 700.

Blast 0.5 g. of the sample for 15 minutes in a platinum crucible. Cool and transfer to an evaporating dish. Mix to a slurry with distilled water. Add 5 to 10 cc. concentrated HCl. Heat gently until solution is complete, breaking up lumps if necessary. Evaporate to dryness on water bath. Add 5 to 10 cc. concentrated HCl, and dilute with an equal volume of distilled water. Digest on water bath for 10 minutes. Filter, and wash with hot water. Evaporate the filtrate to dryness. Dissolve in acid and water as before. Filter and wash with hot water. Ignite the two precipitates together, and weigh as silica and insoluble matter.

Dilute the above filtrate to 250 cc. Add HCl if necessary to insure a total volume of 10 to 15 cc. Make alkaline with NH_4OH. Boil until odor of NH_3 is barely noticeable. Filter, and wash slightly with hot water. Dissolve the precipitate with hot dilute HCl, and repeat the precipitation as before. Filter, and wash thoroughly, with hot water. Ignite, and weigh as oxides of iron and aluminum.

To the filtrates from the above add a few drops of NH_4OH and bring to a boil. Add 25 cc. of a saturated solution of $(NH_4)_2C_2O_4$. Continue boiling until the precipitate becomes granular. Let stand until precipitate settles clear. Filter, and wash with boiling water. Ignite the precipitate, dissolve in dilute HCl, and dilute to 100 cc. Add excess of NH_4OH, and boil. Filter out any insoluble matter, ignite and weigh, and add its weight to the oxides of iron and alumina found previously. To this filtrate, add $(NH_4)_2C_2O_4$, proceeding as before. Filter, and wash with boiling water. Ignite, and blast to constant weight as calcium oxide.

Acidify the filtrates from the above with HCl. Evaporate to 150 cc. Add 10 cc. of a saturated solution of $NaNH_4HPO_4$. Add NH_4OH drop by drop, with constant stirring, until the precipitates starts to form. Then add moderate excess of NH_4OH. Stir for several minutes. Let stand over night. Filter, and dissolve the precipitate in hot dilute HCl. Dilute to 100 cc., add 1 cc. of saturated solution of $NaNH_4HOP_4$, and precipitate as before. Filter, and wash with an alkaline solution made by diluting NH_4OH until it contains 2½ per cent of NH_3 and then adding a few drops of HNO_3. Ignite and weigh as $Mg_2P_2O_7$. Multiply this weight by 0.3621 to find the weight of MgO.

(c) Retesting.

Notice of the rejection of a shipment based on these specifications must be in the hands of the consignor within 10 days after the receipt of the shipment at the point of destination. If the consignor desires a retest, he shall notify the consignee within 5 days of receipt of the notice of rejection. The original testing laboratory shall keep the sample sealed air-tight from the time they have taken out enough material for the original test until the expiration of the 15 days noted. The original testing laboratory shall agree to transmit the sample to any one laboratory for a retest at the direction of both of the contracting parties. This retest shall be at the expense of the consigner.

SUCCESSFUL COURSE IN BOXING.

The industries of the country have responded to the practical course of instruction in Boxing and Crating at the Forest Products Laboratory to such an extent that at the end of the tenth course, July, 1921, 24 different industries in 46 cities had been represented; twelve firms had been represented by two or more men; two firms had sent men to three courses, and one firm had sent men to four courses.

On account of this response, it has been deemed advisable to announce dates for three courses in addition to the November course previously announced. The dates for the courses are as follows: November 7-12, 1921; January 9-14, 1922; March 6-11, 1922; May 1-6, 1922.

This course is essentially a practical demonstration of such points as the characteristics of different styles of boxes and crates, the importance of nailing, the advantages of using dense woods, the efficiency of metal straps, the effect of moisture and change of moisture conditions in lumber on the strength of boxes and crates, tests on wire bound boxes, methods of improving the design of fibre board boxes, and many other points of interest to the box and allied industries. The making of drum tests, drop tests, compression tests and various other kinds of tests can drive home the fundamental principles of container construction as can no amount of published reports.

NOT SO DULL AT THREE RIVERS.

The St. Maurice News-Chronicle says: The Wayagamack Pulp and Paper Co. employed last winter around 1,000 men. There are now employed 600 which will be shortly increased to 800, and an executive of the company states that the mill will run full force this winter the same as usual. An increased demand for kraft paper may result in even busier times than last year at this mill.

Lumbering.

Many of the big companies had decided not to cut this year but the Provincial Government in order to aid unemployment, has reduced the stumpage tax and, as a result, lumbering operations may ensue. Every effort is being made by the government to induce companies to cut this year.

EDWARDS' DEATH LOSS TO INDUSTRY.

(Special to the Pulp and Paper Magazine.)

The Canadian pulp, paper, and lumber industries lost one of their best friends and one of their most respected and influential representatives when Senator William Cameron Edwards, died at his home, 60 Sussex St., Ottawa, last Saturday morning. His funeral, attended by parliamentiarians, representatives of the pulp, paper, and lumber industries, and citizens of all walks of life took place on Monday afternoon.

With the pasing of Senator Edwards, Canada loses one of its pioneer lumbermen, a prominent figure in political and parliamentary life, a noted live stock breeder and a director of several important concerns.

The value of his association to the industry, made itself evident, when he began believing and preaching that Canada's forests and resources were not inexhaustible. Backing his faith in his doctrine he commenced reforestation on his own extensive limits. He was one of the pioneers of reforestation in Canada, and in addition to actual work of reforestation, he was a firm believer in the value of educational methods, along such lines.

The death of Senator Edwards came as a surprise to Ottawa, for though it had been known that he had been ailing for the last four or five years, it was not generally known that he had been confined to his home for upwards a month previous to his death, which was caused by arterio sclerosis.

Senator Edwards was born May 7th., 1844 at Clarence, Ont. On both sides he was of Celtic extraction. His father William Edwards, was Welsh, and his mother Anne Edwards nee Cameron was of good Scottish blood.

After going through the Ottawa Grammar School, his first field of endeavour was in the lumbering business, and his first earnings in this field came in 1863 at Thurso, Que. He was then attached to the pioneer lumbering firm of Cameron and Edwards, with which he remained for five years when he founded the business of W. C. Edwards and Company at Rockland. This company grew to be one of the greatest of its kind in Canada, and a year ago this summer passed to the Riordon Pulp and Paper Company, which on reorganization is known now as the Riordon Company Limited, of which the Senator was a director.

The transferring of the W. C. Edwards interests to those of the Riordon Company, were the principal holdings in a $60,000,000 merger which included the Ticonderoga Pulp and Paper Company, the Kipawa Company, Limited, Gilmour and Hughson, Hull, Que., and the W. C. Edwards Company. Prior to the sale the late Senator had disposed of his dominating interest in the firm and was a preferred stockholder when the deal was put through.

In a business capacity his interests were varied and many. Among the companies with which he was identfied with was the Canada Cement Company of which he was president, Ottawa Hull and Power and Manufacturing Co., the Bathurst Lumber Company, the Canadian Bank of Commerce and the Toronto General Trusts Corporation of which he was a director. He was also president of the Cascapedia Manufacturing and Trading Company, the Library Bureau of Canada, The Canadian Mahogany Company, the Sunplex Milling Co., and vice president of the Robinson Edwards Lumber Company of Burlington, Vermont.

During the many active years of his life, Senator Edwards was a leading official of the Central Canada Exhibition Association, the Canadian Association for the prevention of Tuberculosis, the Montreal Industrial Exhibition Association, the Canadian Association of Breeding, County of Carleton Hospital, International Commission on Bovine Tuberculosis, the United States River and Harbor Commission. In 1909 he was appointed a member of the Conservation Commission of Canada, and his presence on that body was an asset that made itself felt on many occasions. As an industrial promoter he was associated with the Temiskaming Steamboat Company, the Canada Lumber Company, the Consumers Electric Company, and in 1905 was elected president of the Quebec Limit Holders Association.

He entered politics as a liberal member for Russell County in 1882. On that occasion he was defeated, but sat for the same constituency from 1887 to 1903. He rapidly became one of the foremost members of parliament and was a very close friend of the late Sir Wilfrid Laurier. On March 17th., 1903 he was called to the Senate of Canada by Lord Minto.

In 1885 he married Catherine M., eldest daughter of the late William Wilson, who still survives him. He was a member of the Rideau Club, Country Club, Ottawa Hunt Club, Royal Ottawa Golf Club, the Garrison, Mount Royal, and St. James Clubs, Montreal, and of the York and Toronto clubs.—A.

A. P. & P. A. TO MEET IN CHICAGO.

The condition of the paper industry as seen by the manufacturer, the merchant and the consumer will feature the program of the annual Fall business conference at Chicago of the American Paper and Pulp Association and its score of affiliated manufacturers associations. One prominent representative of each group will be on the program.

"Paper Week" will be the week beginning October 31, with Thursday, Nov. 3 as the date of the meetings of the American association itself. The National Paper Trade Association has announced October 31 as the date of the meeting of the merchants and distributors, while the balance of the week will be devoted to meetings of the affiliated associations, most of which, like that of the National Paper Trade Association, and the American Paper and Pulp Association, will be held at the Drake Hotel.

In years gone by the meetings of the paper manufacturers have been held chiefly in New York. With the development of the industry in the Middle West, however, and the establishment of big paper manufacturing districts in the Miami valley of Ohio, the Kalamazoo district of Michigan and the Fox and Wisconsin valleys of Wisconsin, as well as in other sections, it has been decided to hold the Fall conference in Chicago. The first such conference was held last year, and was so successful that it will probably become an annual event.

Wisconsin now ranks third of all the states in the consumption of wood for its paper mills, and other states of the Middle West produce large quantities of fine papers and special grades. While the news print manufacturers, with mills on both sides of the Canadian boundary are not represented by any organization in the American association, several will be in attendance at the business conference.

PRICE BROS. DIVIDEND EQUALS 10 PER CENT.

Announcement is made from Quebec that the directors of Price Bros. & Co., Ltd., at their dividend meeting yesterday declared a dividend of one half of one per cent on outstanding $42,683,200 common stock. This is a reduction from three-quarters of one per cent previously paid or at the annual rate of 2 per cent against 3 per cent inaugurated after the recent reorganization of the company.

Taking into consideration the fact that the company, in the course of the reorganization last year, distributed five new shares for one of the old company the dividend inaugurated last year was at the equivalent of 15 per cent on the old and is now reduced to 10 per cent equivalent.

While no formal statement accompanies the dividend announcement the circumstances are fairly well understood in the street. The company is very largely interested in the lumbering industry in addition to its pulp and paper industry and the depressed condition of the former is well known. The company is understood to be carrying heavy inventories of lumber which it will be necessary to continue carrying until such time as there is a revival in demand.

TROPIC VEGETATION AS SOURCE OF MOTOR FUEL.

Alcohol suitable for fuel to be used for automobiles may be made from the moist vegetation of tropical forests and jungles, according to the view of Mr. H. N. Whitford of the Yale School of Forestry, who delivered a paper before the Cellulose Section of the American Chemical Society at the Rochester Meeting.

The speaker stated that alcohol could be produced satisfactorily from the stalks of many palms, that of the nipa in the Philippines being best adapted for its commercial production. From this source one distillery has actually produced 93 per cent alcohol at a cost of about 20 cents a gallon on a 12 hour basis. If run 24 hours, it is estimated that this distillery could produce alcohol at a cost of about 15 cents per gallon. The annual production of nipa alcohol in the Philippines is near to 3,000,000 gallons and only a small part of the area of the island is under production. To equal the equivalent of 5,000,000,000 gallons of alcohol produced in the United States in 1920 it would require an area of more than 50,000,000 square miles planted in nipa palms.

Other forms of tropical vegetation mentioned were wild grasses, cassaba, maize, rice, cotton and sugar cane.

BROWN CO. DECREASES WAGES.

The news that all the employees of the Brown Corporation will receive a decrease of 16 2-3 per cent (equivalent to the 50 per cent increase of last year) effective the week ending Sept. 14th, has for a long time been expected. The employees are accepting this quite cheerfully, realizing that the Brown Corporation were amongst the first to grant a very generous increase when prices were soaring and are now practically the last to decrease when such action became necessary.

It is pleasing to note that several tradesmen in La Tuque have already announced a reduction in their prices.

No one can neglect to do what he believes to be right without doing what he believes to be wrong.

U.S. BANS SMOKING IN STATE FORESTS.

Looking to the protection of pulp wood and other timber products, Secretary of Agriculture Wallace has forbidden smoking on the national forest lands within the cyclone swept area of the Olympic Peninsula, Wash.

The area covers some 540,000 acres, and was converted into a table fire trap by the cyclone of January 29, which swept the forests of the Olympic Peninsula by a wind estimated to have obtained a velocity of 150 miles an hour.

The devastation is the worst known in the history of the country. Nearly seven billion feet of timber, on a strip ninety miles long and from twenty to thirty miles wide was blown down by the storm and now lies in a tangled mass. Should a fire ever gain headway in this devastated area, foresters say that the most stupendous conflagration in the annals of the nation would result.

WOOD PULP AS A PSYCHOLOGICAL FOOD.

The Connecticut Agricultural Experiment Station report that they have examined a number of diabetic preparations, among which is an interesting product called Cellu Flour.

Cellu Flour is prepared by the Dietetic Cellulose Co., Chicago. It is a carbohydrate substitute made from purified and bleached wood pulp, straw pulp, or cotton fiber; it is white, tasteless, and non-nutritive, containing no starch, sugar, fat or protein; and is used for filling out reduced diets such as indicated in the Allen Treatment of diabetes. While it furnishes no nourishment it is said to satisfy hunger and reduces the tendency to over-eat. It might be called a psychological food.

The analysis of the flour is as follows: Moisture, 5·52 per cent; ash, 0·30 per cent; protein, none; fiber, 57·25 per cent; nitrogen-free extract, starch; none; Reducing sugars—Before hydrolysis, none; after hydrolysis, none; other nitrogen-free extract (modified celluloses), 36·93 per cent ether extract, trace.

By the conventional method of proximate analysis this material showed 57·25 per cent of crude fiber and a nitrogen-free extract of 36·93 per cent. It was found, however, that neither the acid nor the alkali digestates as obtained in the determination of crude fiber produced copper reducing substances and that therefore presumably little of the material thus removed is available for digestion but consists rather of soluble cellulose complexes of modifications.

A shipment of nearly two million feet of British Columbia fir, from Vancouver via the Panama Canal, arrived at Three Rivers recently. This is the first vessel, it is understood, to make the trip from British Columbia to Quebec ports via the Canal.

Announcement has been made that the University of New Brunswick has created a new chair in Forestry. Since the department was established some thirteen years ago there has been but one technical forester in the University. The demand for foresters has been so heavy in recent years that a second instructor has been appointed, and it is hoped that still further development will come in the near future.

The plant of the Nashwaak Pulp and Paper Company, which has been shut down for some months, has resumed operations. The mills give employment to about 400 hands and have an output of sixty tons of bleached sulphite pulp a day.

Technical Section

REVIEW OF RECENT LITERATURE

A-1. Use of French Colonial Woods for Paper Pulp. RAOUL MONMARSEN. **Papier,** xxiv, 64-6 (Feb. 1921). Brief analysis of the importance of utilizing the French Colonial woods for the manufacture of paper pulp and of the causes which have militated against their employment up to the present time. — A. P.-C.

A-1; G-0. Zinc Fluoride as a Preservative for Wood. R. NOWOTNY. **Oesterr. Chem. Zeit.,** xxiii, 136-8 (1920); **J. Soc. Chem. Ind.,** xl, 11A (Jan. 15, 1921). Tests on 15,763 telegraph poles extending over eight years show that zinc fluoride is a particularly suitable preservative, as it is soluble with difficulty and highly toxic to mold growths. The wood is soaked in a mixture of zinc chloride and sodium fluoride solutions, each of 1.75 percent concentration, and heated to 45 to 60° Cent. to form zinc fluoride or the basic fluoride. The total wastage of poles in eight years was only 6 percent (the loss for any one year never exceeding 1.82 percent) as compared with a total of 34 percent in the case of similar poles treated with copper sulphate. The best results are obtained when the timber absorbs about 3 kg. of zinc fluoride per cu. m. The chief drawbacks to the use of zinc fluoride, are the inconvenience of liquid zinc chloride in transport and the premature formation of the fluoride. The latter may be prevented by neutralizing the sodium fluoride solution by adding sulphuric acid or sodium bisulphate to it (the mixture must not react acid to methyl orange) prior to adding it to the zinc chloride. The use of zinc sulphate instead of zinc chloride (Renfer & Co. A.-G., Swiss patent No. 75,478 of 1917) is preferable. A satisfactory preservative may also be made by mixing powered zinc sulphate, sodium sulphate, and sodium bisulphate in suitable proportions and dissolving the mixture in water when required for use. The timber should be thoroughly dried prior to impregnation.—A. P.-C.

A-1. African Woods for Pulp. CLARENCE JAY WEST, **Paper,** xxvii, 24 (Feb. 16, 1921). Notes on the suitability of some West African softwoods (from Gambia, Sierra Leone, Gold Coast and Nigeria) for the production of pulp: **Adansonia digitata** (Baobab), cotton tree **(Eriodendron anfractuosum** and **Eriodendron orientale), Bombax buonopozense,** African maple **(Triplochiton johnsonii** and **Triplochiton nigericum**), **Sterculia barterii, Sterculia tomentosa, Sterculia rhinopetale, Sterculia tragacantha, Albizzias, Terminalia superba, Alstonia congensis, Ricinodendron heudeletti, Pycanthus kombo, Musanga smithii.**—A. P.-C.

A-1 & 15. Determination of Lignin. EMIL HEUSER, Translation by CLARENCE J. WEST. **Paper** xxvii, 23 (Feb. 9, 1921), 24, (Feb. 16, 1921). Critical review of Konig's Wilstatter's, Krull's and Konig and Rump's methods for the direct determination of lignin, and of Benedikt and Bamberger's (methyl number as methyl iodide), Cross, Bevan and Brigg's(by means of phloroglucinol), and Seidel-Hempel's (by means of nitric acid) methods for the indirect determination of lignin. A. P.-C.

A-16. Use of Aluminum Bronze in the Paper Industry. E. MESSMER. **Monit. Papeterie** lii, 18 (Jan. 1, 1921), 65-6 (Feb. 1, 1921). Aluminum bronze possesses a very high resistance to mechanical action and to chemical reagents, which renders it valuable in paper mills, especially for bedplate and beater roll bars in the manufacture of fine and semi-fine papers. Its merits are briefly discussed.—A. P.-C.

B-2. Production of Wood and Reforestation. CH. GROUD. **Papier,** xxiv (Feb. 1921). A very brief outline of production, importation and exportation of wood in various countries, and of the necessity of reforestation, both from the point of view of the wood-using industries and from a climatic point of view.—A. P.-C.

C-6. Saw Filing Gage. Can. patent No. 210,527, SAMUEL B. BROWN, Cairo, Illinois, U.S.A., April 19, 1921. Claims allowed 7.—A. P.-C.

C-6. Reciprocating Saw. Can. patent No. 211,547, ELIAS SAMUEL HOMSTAD, Redfield, South Dakota, U.S.A., May 17, 1921. Claims allowed 1.—A. P.-C.

C-6. Saw. Can. patent No. 211,578, LOUIS PHILIPPE MUNGER, Shawinigan Falls, P.Q., Canada, May 17, 1921. Claims allowed 6.—A. P.-C.

C-7. Barking Machine. Can. patent No. 211,529, per ALBERT FRESK, Robertsfors, Sweden, May 17, 1921. A toothed roller rests on the log to be barked and not only turns the log but also feeds it in the longitudal direction. The roller can also be positioned obliquely with respect to the log. The shaft that transmits motion to the roller is flexible and can yield to the turning movement of the roller spindle, so that the axis of the roller may be from a position substantially parallel to the axis of the log to a position substantially at right angles to it. One end of the flexible shaft is in a bushing journalled in a bearing which is rigid relatively to the rotating roller spindle, while the opposite end of the shaft is attached to a bushing journalled in a bearing carried by the rotating roller spindle. Claims allowed 5.—A. P.-C.

C-7. Attachment for Resawing Machines. Can patent No. 211,830, JOSEPH A. NEAL, Crichton, Ala., U.S.A., May 24, 1921. Claims allowed 12.—A. P.-C.

D-4. Pulp Grinder. Can. patent No. 210,635, GEORGE JAMES MASON, Toronto, Ontario, Canada, April 19, 1921. In a pulp grinder, a grinding element formed of cement, sharp sand, and saw dust. Claims allowed 2.—A. P.-C.

F-0; K-6. Straw Pulp. Can. patent No. 210,770, JOHN BACHE-WIIG, assignee of a half interest, and CARL BACHE-WIIG, assignee of 70 per cent of the half interest, both of Portland, Maine, U.S.A., April 19, 1921. The process of preparing paper pulp material from strawlike substances containing ligneous matter which consists in heating the substances in the presence of a bleaching and softening agent of a strength too weak to injure the fiber, and to a temperature not exceeding 100° Cent. for a predetermined period of time not exceeding twenty-four hours, withdrawing the softening agent and washing the mass, digesting

(Continued on page 984).

British Trade News

(From our London Correspondent.)

London, September 5, 1921.—The financial statement of the Hartlepool Paper Mill was issued during the past week for the period February 1, 1920, to April 21, 1921. It shows that after deducting £33,826 for depreciation, £4,806 for maintenance and repairs to machinery and mill, and £12,500 for interim dividend there is a debit balance of £36,987. The mill is now fairly well supplied with orders and the Directors look forward with confidence to a considerable improvement in trade in the autumn. The new machine house is very nearly completed and it is hoped that the new machine will be running by the early part of 1922. This should largely increase output of the mill and reduce the cost of production. Negotiations which have been taking place for some considerable time past with reference to the contemplated amalgamation of the company with others have not matured.

Crisis in Norway.

Last week I made a short reference to labor troubles in Scandinavia and the news has now reached London that in Norway there is a crisis more serious than some people realize. The pulp and paper mills are concerned and the root of all the evil lies in the reduction of wages. Employees have been offered the old scale of wages revised, but they will not accept theem and their position is so critical that even negotiations with mill-owners are refused. There is now a strike which has thrown back the paper and pulp market during a state of revival and no orders are reaching the mills. Of late Norway has been a hot bed of discontent for labor agitators.

Commenting on August business the Norwegian Chamber of Commerce, in London, says: As regards new business August is generally a quiet month, and this year has been no exception to the rule. Most of the paper mills work only part time, but comparatively large shipments have been made under running contracts, as far as the Government will allow revaluation of existing stocks per August 31st for the purpose of taxation. For the few fresh inquiries going there is a very keen competition with greatly varying prices and Swedish shippers in spite of the state of their exchange as compared with the Norwegian, in most cases manage to make lower quotations than the Norwegian shippers. Very few orders go to Germany and Czecho-Slovakia, although their prices, as a rule, are still lower. It may probably be expeected that we may see more activity next month, more especially for business over next year, although small prompt quantities will certainly also be required over the rest of this year.

Troubles in the Printing Trade.

There is trouble in the British Printing Trade which may reflect seriously in the paper industry if some settlement is not soon arrived at. Notices have been posted in all printing works in the country, which may, or may not, result in a strike, concerning the reduction of $2.50 in wages per week and the workers may take it as a lock-out notice. The position is an unusual one and the Labor Ministry is intervening. Some of the workers say the reduction is too much, but the Master Printers think it fair.

Cropper & Co.'s Success.

At the 24th annual meeting of Cropper & Co., Ltd., the President, Mr. H. H. Killick, stated the company had surmounted the grave difficulties with which all industrial business has recently been faced. The industrial crisis had affected the paper trade very severely, but it was satisfactory to know that the Colthrop board and paper mill was able to distribute a dividend of 7½ per cent for the year ended May 31st last.

Paper Box and Bag Workers Unsettled.

The paper-box and paper-bag workers in the City of Birmingham held a meeting two days ago on the question of the proposed reduction of wages, which is also taking place in the paper industry, and it was decided to forward a resolution to the Trade Board protesting against any interference. Close upon 1,000 men and women are engaged in these sections of the printing bookbinding, machine-ruling and paper industry. It was explained to the meeting that the proposal to reduce the wages of qualified paper-box workers from 76s to 72s per week in the case of men and from 37s to 33s in that of women. It is also proposed to effect a similar reduction in the wages of women working in the paper box making trade and to make the following "cuts" in those of male workers over 23:—machine tacklers from 82s to 75s per week; cutters from 74s to 68s; pressers, slitters, etc., from 70s to 65s; general workers from 57s to 53s; and learners in proportion.

The Pulp Situation.

Groundwood has been inquired for lately and a little more life is shown in business transactions. On the sulphite and chemical side it may be said that the uncertainties of things in general just now leave the market quiet. Prices show a drop. The many deterrent factors telling against the paper industry which prevent it getting into a revived state, after the period of dullness, keep the supplies of chemical pulps from passing into consumers' hands more quickly. There is a dead and alive feeling and pulp men complain of it.

Prices in London are about as follows:—Bleached sulphite (No. 1) £22 7s 6d; Easy Bleaching (No. 1) £19; Sulphite newsprint quality £17; unbleached soda (No. 1) £20 15s; soda kraft £17 18s 6d; groundwood (wet) £5 prompt delivery, and dry £9 a ton.

Notelets.

Shipments of pulps from Canada are scarce just now.

The Germans and Scandinavians are stated to be offering chemical pulps at a slight reduction in price.

In the country of Kent, where the British hand-made paper industry exists, business is reported to be "good". This branch of the industry has had a most successful time since the beginning of the year.

Attempts are now being made in the United Kingdom to "cut" wages. It is contended that low wages and a reduction in the cost of raw materials are necessary for a revival of the trade in the United Kingdom—speaking generally.

The wood storage yards of the Neekoosa-Edwards Paper Company, Port Edwards, Wis., were completely wrecked by a fire recently. More than $120,000 worth of logs ready for the mill were destroyed and the total damage sustained is estimated at half a million dollars. Officials said that sparks from a locomotive owned by the company started the blaze.

Ideas are like pins; they should be picked up wherever seen and put to some practical use if there is any point to them.

The Pulp and Paper Trading Co., 21 East 40th St. New York has been appointed sole selling agents for coated lithograph and printing papers made by the Ware Coated Paper Company, Ware, Mass.

PULP AND PAPER NEWS

The Joint Council of Industry, according to an announcement made at Winnipeg, has issued a finding in regard to the job printers' dispute in so far as it applies to a certain number of Winnipeg firms who signed up with their employees for a forty-four hour week and agreed to submit the question of wages to arbitration. The award fixes the wages for the period beginning the 12th September, and ending the 30th June next, at 90 cents an hour. The finding is a reduction on the prevailing scale. The Joint Council suggests that its award be accepted as the basis for negotiations between the pressmen's and bookbinders' union and their employers. The award is acceptable to both the union printers and their employers who recognize the forty-four hour week. The dispute in the printing trade in Winnipeg has been on since the 1st July. A number of printing firms in the city have declared for an open shop, following on the refusal of the Typographical Union to submit the question of hours to arbitration.

It is likely that the striking printers will take a considerable part in the elections in Toronto. The Socialist leader, Mr. James Simpson, who has been a protagonist on the side of the printers ever since the inception of their strike, is to be a candidate, it is said, for one of the divisions of Toronto. Beyond this, it is inevitable that the question of the forty-four hour week will loom up during the election. And it is for the forty-four week that the printers are on strike at the moment.

Many of the job printing plants in Toronto are said to be closing down, by reason of lack of business. On the other hand, one hears of some plants of the kind that are extremely busy, just now.

In spite of the heavy decrease in the wages of men in pulpwood and lumber camps—these wages are in some cases about $25 or $30 a month, or less than a half of those paid last year—whenever there is a call for men to go into such camps, the concerns issuing the calls are literally inundated with applications. This shows how acute the unemployment situation is at the present time. Indeed, it is one which, at any rate in the larger centres, is causing grave apprehension as to the difficulty of getting through the next winter, particularly if this should chance to be long and severe.

In these columns, it has previously been pointed out that the cutting down of advertising in which practice so many firms have indulged during this period of depression, and which has reacted so detrimentally on the paper industry, is one of the most falsely economical practices that can be conceived. In a talk which the writer had the other day with one of the very largest manufacturers in Toronto, the latter was most emphatic in his confirmation of this view as absolutely and unequivocally correct. "Plenty of Canadians business houses," he said, during the period of booming prosperity, advertised enormously at a time when orders were coming in practically of their own accord. Now when orders are hard to get, they are cutting down their advertising. In so doing, they are letting up on their salesmanship and grouching about bad times. They will bitterly rue their adoption of a policy of such patently false economy."

The Hon. W. E. Raney, Attorney General of Ontario, took occasion, last week, to defend what is known as the "Backus deal" — a subject which continues to evoke a good deal of discussion in Ontario. After sketching the steps which led up to the purchase by Mr. W. E. Backus, of the area of timber limits in controversy, Mr. Raney said that complications had set in when Mr. Backus discovered that the Lake of the Woods limit did not contain sufficient pulpwood to supply the mill he had contracted to erect at Kenora, Ont., for the term of his lease, and when notification was received from the International Joint Commission on Waterways, restricting his area of the Northern Dam for the generation of power. "This was the situation," he went on, "when the present Government came into power. It promptly notified Mr. Backus that he must either keep his contract or suffer the cancellation of his lease of the Lake of the Woods pulpwood area. He answered by urging the difficulties I have referred to, and by asking three things: the renewal of the lease of the Lake of the Woods limit, the grant of a waterpower to operate the mills which he would build, the addition of a further area of pulpwood lands to ensure a supply of pulpwood for the term of his lease. In the alternative, Mr. Backus offered to surrender the lease of the Lake of the Woods limit." Then Kenora town, which was naturally, vitally interested, took a hand in the negotiations, and made an agreement with Mr. Backus, which was ratified by ninety-five per cent. of the ratepayers who voted on it. "What has been given to Mr. Backus," said Mr. Raney, "is the right to spend his money to develop the White Dog Rapids' waterpower, subject to absolute control of the Government."

A bonus to the striking Toronto printers, in the shape of their winter's supply of fuel, will be given by the Local Typographical Union, if the strike is not settled within the next four weeks.

TO RECEIVE SAGUENAY STOCK.

A circular has been issued by the Guaranty Trust Co. of New York to shareholders of the North American Pulp and Paper Companies' Trust, stating that the option granted to the trustees in dissolution of the latter corporation to dispose of the Saguenay Pulp and Power Co. stock has not been availed of, and that the certificates of deposit for common stock of the North American Trust are now exchangeable for the proportionate amount of preferred and common stock of the Saguenay Pulp and Power Company, each of a par value of $5 per share on the basis of 2 2-5 shares of preferred and eight shares of common for each ten shares of North American common. The option to dispose of Saguenay expired on August 15, and in view of this fact there was nothing for the trustees having in hand the dissolution of the trust to do, but to issue Saguenay stock for the certificates of deposit for North American comon stock held by the Guaranty Trust Company. The circular adds that holders of certificates may receive cash in lieu of the Saguenay stock at the rate of $3 per share for both preferred and common.

VOLUME COMPOSITION.

By PAPER EXPERT.

The presence of china clay in paper influences directly two important properties—strength and volume composition. This is at once illustrated by the extreme case of an imitation art paper in which the aim of the paper maker is to get a maximum percentage of mineral matter in order to produce the required result of a high finish to a cheap paper. The lack of strength and of resistance to rough usage is an inevitable accompaniment and a necessary limitation to this class of product, being well known to all users and printers.

The proportion of clay in paper may vary from 6 to 8 per cent., usual in cheap news, to 30 or 32 per cent., which obtains in thin imitation art. The actual thickness of paper is not increased by this excessive addition of clay to anything like this ratio, for the mineral first fills up the air spaces between the fibres before its influence is felt on the external surfaces of the sheet.

The physical properties of an imitation art can be appreciated by a study of what is known as "volume composition." Just as it is possible to determine exactly what is the percentage of clay in terms of weight if portion of a sheet of paper in terms of volume is occupied by clay. That is to say if a paper contains 30 per cent. by weight of clay what is the actual amount of space filled up with the china clay in comparison with the fibre?

The question of volume composition was first discussed in a booklet entitled, "The C. B. S. Units," and a more complete explanation of the subject in simpler terms appears in Sindall's Paper Technology. A sheet of paper has definite dimensions, length, width and thickness. It therefore possesses a corresponding "volume", and definite proportions of that volume are filled with fibre, mineral matter, sizing and other ingredients respectively. But however dense and close the sheet may be rolled or calendered, a certain proportion of the volume is air space. China clay exercises an important function in certain papers by filling up that air space more or less.

The case may be studied most readily by means of an example. What is the composition by volume of an imitation art paper having the following composition by weight?

Loading, 30 p.c. Fibre, 70 p.c.

For the measurement of volume composition, other physical properties are required thus:—

Substance: Grams per square metre, 85. Thickness: One sheet, millimeters, .089.

The first calculation is to find the weight of paper, loading and fibre in terms of grams per cubic centimeter.

Paper.

$$1{,}000 \text{ mm.} \times 1{,}000 \text{ mm.} \times t \text{ mm.} = 85.$$

$$\text{then } 100 \times 100 \times \frac{t}{10} \text{ cubic centimeters} = 85.$$

$$\text{weight per cc.} = \frac{85}{1{,}000t} = \frac{85}{89} = 0.95 \text{ gms.}$$

Ash.

Of the actual weight, 0.95 grams, ash or loading is 30%, namely, 0.285 grams.

Fibre.

The weight of one cubic centimeter of paper is 0.95 grams, of which 0.285 grams is china clay, leaving 0.665 grams as the weight of fibre in the unit volume (one cc.).

The ascertained facts are:—

Paper	0.950	gms.	per	cubic centimeter.
Fibre	0.665	"	"	"
Ash (loading)	0.285	"	"	"

The second step in the calculation is to determine the volume occupied by the quantities of fibre and clay above set out.

The volume of each ingredient is determined by taking into account the specific gravity, and calculating from the well-known relation.

Sp. Gr. = Weight ÷ Volume

The specific gravity of cellulose, or fibre, is taken at 1.50, this being sufficiently accurate for practical purposes. Hence, in the above formula, substituting the figures we get

$$1.5 = .665 \div \text{volume},$$

$$\text{or volume} = .665 \div 1.5 = 0.44 \text{ cc.}$$

The specific gravity of china clay varies within small limits and may be taken here as 2.5. Then in the same way we get

$$2.5 = 0.285 \div \text{volume}.$$

$$\text{volume} = .285 \div 2.5 = 0.114 \text{ cc.}$$

Since the one cubic centimetre of paper only contains fibre and china clay it follows that the balance of volume still over is simply air space,

viz., $1.00 - (0.44 + 0.114) = 0.446$ cc.

Expressing the final result as a percentage, the volume composition of this paper is

Fibre, 44.0; china clay, 11.4; air space, 44.6;
Total, 100.0.

Sindall gives the following formulae for calculating the volume composition, and these are presented in a form which reduces the calculations necessary to a minimum.

Measurements.

Weight of paper in grams per sq. meter .. .. ..G
Thickness of paper in millimeters .. .. t
Percentage of mineral loading (say clay) .. .. ..m
Percentage of gelatine (tub-sized papers) .. .. g

Calculations (for grams per cubic centimeter).

Weight of one cc. of paper = S = G ÷ 1,000t
Weight of one cc. of clay = A = Sm ÷ 100
Weight of one cc. of gelatine = T = Sg ÷ 100
Weight of one cc. of fibre = S — (A + T).

Volume Composition.

Fibre .. .. = 100 F ÷ 1.5
Clay .. .. = 100 A ÷ 2.5
Gelatine . .. .. = 100 T ÷ 1.35
Air Space = 100 — (Fibre + Clay + Gelatine).

As a striking contrast to an imitation art showing only 44-45% of air space may be mentioned a bulky "antique" book paper made of esparto, without any mineral matter, having an air space of nearly 70%. It is not surprising that both classes of paper are incapable of resisting much wear and tear, the one on account of a high percentage of china clay and the other on account of an excess of air spaces.

—China Clay Trade Review.

No man loses by being true to his convictions. He may not be popular but what does that amount to?

Every man should keep a fair-sized cemetery in which to bury the faults of his friends.—Henry Ward Beecher.

UNITED STATES NOTES

Carl Young, Commissioner of Labor for Michigan State, has started an accident prevention campaign in which he is being backed by the compensation insurable companies and the manufacturers of the state. A conference between state officials and representatives of the Michigan Manufacturers' Association will signalize the opening of the safety campaign. Commissioner Young wants to bring preventable accidents down to an irreducible minimum. He points out that while the initial cost of completely safeguarding machinery is sometimes a little high, inspections by the state department will compel all employers to safeguard unprotected machinery and if the safeguards are not added to new equipment they will have to be added at considerable expense.

The Oregon Pulp and Paper Company has under way the construction of a dam across the North Mill Creek just above its plant near Salem, Ore. Upon the completion of the dam, a new power-house will be erected.

Charters to operate mills in the village of Bellows Falls, Vermont, were given last week to newly formed concerns, the Babbitt-Kelley Paper Company with a capital stock of $100.000, and the Robertson Paper Company, Inc., capitalized at $200.000. F. H. Babbitt E. W. and H. T. Kelley of Bellows Falls are named as incorporators of the Babbitt-Kelley Company, and the names of Joseph E. Babbitt and F. H. Babbitt are signed to the papers of the Robertson Company.

Beaters, fourdrinier wires, dyes for paper, and a particularly fine display of temperature and other recording instruments for the paper mill were among the items of interest to paper manufacturers exhibited last week at the sixth annual exposition of Chemical Industries in New York City. Registration of distinguished visitors showed that more than five hundred notables in science and industry in foreign countries attended. Of these nearly 400 were English and Canadian chemists. 50.000 persons visited the exposition hall during the week and an unusual feature was the attendance of a large number of persons not versed in chemical technicalities.

Paul Jouanneau, of Vendome, France, who is associated with his father in the paper manufacturing firm of Vaissier, Caron & Co., is returning to France this week following an inspection tour of American paper mills that has taken him to nearly all parts of the United States and Canada. Mr. Jouanneau makes the following observations regarding the American industry: "I have been very much interested in the mills I have visited. Your mills are very much different than ours. In France we have no fast machines, the fastest being 400 feet, while some in America run 1,000 feet a minute. The American mills are comparatively new, are larger and much better than any of ours. My father's mill was making paper 400 years ago. In France we have very few mills with three machines and may have less. The low duty on German paper has resulted in many of our mills being shut down. Unless a duty is placed on paper that will keep German paper out of our market our mills will all have to shut down."

As the outcome of a recent conference in Albany of the officers of the various international brotherhoods and local delegates representing all organizations involved in the present controversy with the International Paper Company, a resolution was passed favoring a settlement of the dispute on the basis of a union shop agreement, a wage scale similar with the award of the arbitration board and the continuance of the working conditions effective in mills prior to May 1. While there was no representative of the International Paper Company present at the conference, the meeting was understood to have been held at the instigation of a third party acting as mediator in an effort to bring about an adjustment of present difficulties.

Reports from various centers in Michigan indicate that business in the board mills is becoming brisker. September began with every board manufacturer in the Kalamazoo district operating his plant. While there is no indication just now of an immediate rush of orders, executives generally are hoping to get enough business to keep their organizations busy during the winter months. With plants running generally at or near full capacity there is even room for new plants as is evidenced by the completion of the Monroe Paper Products Company's mill and the booking by this concern of a fine lot of first orders.

Indications of the business depression are still evident, however, in other branches of the paper industry in Michigan. While the Western Board and Paper Company declared a dividend of 3 per cent September 1, the first for the ensuing year, many other Michigan corporations have either passed or reduced their usual dividend payments this fall.

The Technical Association of the Pulp and Paper Industry now has quarters in the general offices of the American Paper and Pulp Association, 18 East Forty-first street, New York City. Among recent changes and transfers of grades is announced that of C. W. Whitehouse, sulphite superintendent of the Abitibi Power and Paper Company, who has been transferred by the executive committee upon his application from the grade of associate member to that of active member.

WHAT IS A JOB?

A job indicates some service, a position means pay. A steady job is man's best friend. Is sends a man to sleep at night without anxiety as to how he will land or where he will land without work.

A steady job pays a man while he is improving his ability to earn more and hold down a good position. Moving out of one job into another job is sometimes necessary, but more often it is an evidence that you are a drifter and not a doer.

An etxra number of stripes on your sleeve is pretty good proof that you are dependable, and a dependable man is truly an important asset in any organization.

Leaving one job and waiting to find another is the biggest speculation on the market today. Good jobs are hard to find now, for where there is a good job, there are many applicants. My suggestion is, stick to your job. — Exchange.

(Continued from page 981).

the mass in sulphite liquor at a temperature not exceeding 160° Cent. for a period of time not exceeding ten hours, injecting into the mass a solution of sodium chloride at from two to five hours after the beginning of the digestion, draining off the liquor, washing the mass, and grinding it in a kollergang to form a pulp. Claims allowed 11.—A. P.-C.

E-5. Chemistry of Sulphite Cooking. A. CHAMBOVET. **Papeterie,** xl, 14-9 (May 25, 1919), 65-73 (June 10, 1919), 110-4 (June 25, 1919), 151-9 (July 10, 1919), 186-90 (July 25, 1919); xlii, 242-7 (March 25, 1920), 294-6 (April 10, 1920); **Paper,** xxvii, 21, (Jan. 26, 1921), 22 (Feb. 2, 1921), 23 (Feb. 9, 1921), 24 (Feb. 16, 1921). See **Pulp and Paper,** xvii, 736, E-5 (Aug. 28, 1919); xviii, 1145, E-5 (Nov. 4, 1920).—A. P.-C.

H-4. Electrolytic Cell. Can. patent No. 211,543, JOHN HARRIS, Lakewood, Ohio, U.S.A., May 17, 1921. Claims allowed 10.—A. P.-C.

H-4. Electrolytic Apparatus. Can. patent No. 211,564, ISAAC HARRIS LEVIN, New York, N.Y., U.S.A., May 17, 1921. Claims allowed 10. Also Can. patent No. 211,565, Claims allowed 5. Also Can. patent No. 211,566, claims allowed 6. Also Can. patent No. 211,567, claims allowed 7. Also Can. patent No. 211,568, claims allowed 7. Also Can. patent No. 211,569, claims allowed 5. Also Can. patent No. 211,570, claims allowed 14.—A. P.-C.

H-4. Electrolytic Cell. Can. patent No. 211,901, THE CHLORINE PRODUCTS Company, assignee of WILLIAM MARSHALL JEWELL, both of Chicago, Ill., U.S.A., May 24, 1921. Claims allowed 27.—A. P.-C.

H-4. Electrolytic Cell. Can. patent No. 211,902, THE CHLORINE PRODUCTS COMPANY, assignee of OMAR HESTREN JEWELL, both of Chicago, Ill., U.S.A., May 24, 1921. Claims allowed 17.—A. P.-C.

H-0. Electrolytic Cells in the Paper Industry. Anon. **Papeterie, xliii** (Feb. 25, 1921). Brief outline of the extent to which electrolytic chlorine and caustic soda are used in the pulp and paper industry in Europe. Their use in France is not likely to develop at present, as the French market is already overstocked with chlorine, and if the paper mills were to prepare their caustic electrolytically they would probably experience difficulty in disposing of the excess chlorine thus produced.—A. P.-C.

K-6 & 0. Groundwood and Waste Papers in the Manufacture of Paper. E. ARNOULD. **Papier,** xxiv, 48-50 (Feb. 1921). In the manufacture of the commoner grades of paper, where volume of production is the primary consideration and quality is of secondary importance, the main thing is to have equipment having a large capacity, so as not to risk holding up the paper machines. Pulpers like the Schreder, Dietrich, Wurster, Van Hemelrick, Lannoye, etc., are fairly satisfactory for this class of work, though they are really kneaders, rather than crushers; and kollergangs also give fairly satisfactory results, though they work by kneading the pulp and rubbing the fibers against one another. But for the manufacture of fine and semi-fine papers, such as writing, book, wallpaper, etc., a much more regular and uniform surface and a finer grain are required. The use of groundwood pulp in these papers is permissible only in so far as it does not detract from the appearance of the paper, and is used to lower the cost of production and as a filler to increase the opacity, but should not affect the quality of the product. With the pulpers named or with kollergangs, the shives are not eliminated and show up in the finished paper. A satisfactory equipment devised for this kind of work consists in a beater in which there is one or two large drums with blades, each of them working in conjunction with a much smaller drum. The shredding effect of this combination is very much greater than in the ordinary beater, and the machine is really a combination shredder and beater which can also be used as a bleacher and washer for the pulp. (Fr. patent No. 499,318, **Le Nord Africain,** Nov. 15, 1919; **Le Papier,** xxiii, 80-1, April 1920). The only really satisfactory crusher, yet devised for the preparation of mechanical pulp for the manufacture of fine papers, is an edge runner equipped with scrapers which bring the pulp (containing only 25 per cent of moisture) into the middle of the course, so that it is really crushed between the rollers and the course. The output is barely half of that of the usual edge runners, and it is not as easy to operate; but it works up the stock exactly in the manner desired, without excessive hydration, which is one of the faults with the ordinary forms of kollergangs.—A. P.-C.

K-7. Hydration of Sulphite and Esparto Pulps. Papeterie, xliii, 146-9 (Feb. 25, 1921). Sulphite, especially when prepared by cooking at a low temperature with a weak acid, hydrates very readily in the heater, because of the presence of hemicelluloses. This is quite desirable for parchment or greaseproof papers, but must be avoided in the manufacture of print or writing papers. Esparto pulp, being a soda pulp, does not easily hydrate, and may advantageously be mixed with sulphite to reduce the tendency of the latter to hydrate, and may advantageously be mixed with sulphite to reduce the tendency of the latter to hydrate too readily. Moreover, esparto gives suppleness and bulk to the paper and makes it take the ink particularly well even under moderate pressure, which is especially important for lithographic work.—A. P.-C.

K-10. Sizing Composition. Can. patent No. 211,234, THE CORNELL WOOD PRODUCTS COMPANY, Chicago, Ill., assignee of FREELAND JOHN MORRISON, Cornell, Wis., both in the U.S.A., May 3, 1921. A sizing composition comprising 3 to 15 percent of sodium silicate, 1 to 7 percent of an organic adhesive, 1 to 8 percent of a filler, and water. Claims allowed 2.—A. P.-C.

K-12. Self-clearing Silencer for Paper Machines. Can. patent No. 211,964, WILLIAM E. STEWARD and THEODORE STOUGHTON, assignee of a half interest, both of South Glen Falls, N.Y., U.S.A., May 24, 1921. Claims allowed 7.—A. P.-C.

K-12. Electric Drives in Paper Mills. Publications Techniques, iii, 33-44, (June, July, August, 1920). Brief discussion of the advantages of the electric drive in paper mills, with a fairly detailed description of the Leonard system of electric drive for paper machines.—A. P.-C.

K-18. Plaster Board Composition. Can. patent No. 210,289, EUSEBE FOISY, Montreal, P.Q., Canada, April 12, 1921. A composition consisting of pure water, cubic foot; unslaked lime, 9 lb., and wood shavings (from planer), 2 lb. Claim allowed 1.—A. P.-C.

K-18. Fiber Board from Wood Bark. Can. patent No. 210, 345, CARL GEBHARD MUENCH, St. Paul, Minnesota. U.S.A., April 12, 1921. Waste bark material is mixed with 9 parts of water, is reduced to pieces of a substantially uniform size, which are then shredded and disintegrated into a mixture of outer bark scale material and several classes of fibers. The

pulp is then screened and formed into a sheet, along with woodpulp tailings if desired. Claims allowed 9. —A. P.-C.

K-18. Fiber Board. Can. patent No. 210,369, JOHN K. SHAW, Minneapolis, Minnesota, U.S.A., April 12, 1921. Claims allowed 17. Also Can. patent No. 210,-370, a fiber board composed of different layers of different kinds of fibers interlaced with each other, one of the layers being composed of waterproofed fibers, while another of the layers is composed of fireproof fibers. Claims allowed 7. Also Can. patent No. 210,-371. Claims allowed 8.—A. P.-C.

K-18. Manufacture of Wallboard. Can. patent No. 211,608, JOSEPH VENIER, Belmont, Man., Canada, May 17, 1921. A plaster board comprising layers of intimately mixed and moistened hard wall plaster and sawdust united while plastic with an intermediate layer of burlap and external finishing layers of plaster. Claims allowed 2.—A. P.-C.

K-18. Composition for Sheeting. Can. patent No. 211,879, JAMES HARCOURT WETHERALL, Prince Hill, Victoria, Australia, May 24, 1921. The material consists of disintegrated paper (30 to 50 percent) a cereal substance such as flour in a pulpous condition (65 to 45 percent), and a binding agent with or without a powdered filling of mineral or vegetable matter (5 percent). Claims allowed 6.—A. P.-C.

K-19. Use of Casein for Coating Paper. R. MILLER. **Papeterie,** xliii, 157-8 (Feb. 25, 1921). Though casein gives fairly good results it is not as satisfactory as gelatin, as it is more prone to putrefaction and must be prepared a relatively short time before use (less then forty-eight hours in summer). The addition of formaldehyde as a preservative has the disadvantage of thickening it and prevents it from working properly. Miller has found by personal experience extending over forty-seven years that borax and ammonia (10 percent of either) are the most satisfactory solvents and prefers borax to ammonia (10 percent of either) are the most satisfactory solvents and prefers borax to ammonia. But when the casein is to be mixed with substances having an acid reaction, it is well to add a slight excess of ammonia to prevent the casein from thickening. Foaming in the sizing tub can very readily be prevented by the addition of a little milk or oil of turpentine to the coating solution, or by allowing amyl acetate to drop slowly on the surface of the solution.

K-21. Composition Roofing. Can. patent No. 210,-448, THE ROOFING PATENTS COMPANY, Buffalo, New York, assignee of ALEXANDER S. SPEER, Chicago, Illinois, both in the U.S.A., April, 1921. Claims allowed 8. Also Can. patent No. 210,449. Claims allowed 2. Also Can. patent No. 210,450. Claim allowed 1. Also Can. patent No. 210,452. Claims allowed 10. Also Can. patent No. 210,453. Claims allowed 8.—A. P.-C.

K-21. Apparatus for Cutting Roofing Sheets. Can. **patent No. 211,666,** THE ROOFING PATENTS COMPANY, Buffalo, N.Y., assignee of ALEXANDER S. SPEER, Chicago, Ill., both in the U.S.A., May 17, 1921. Claims allowed 7.—A. P.-C.

K-21. Method of Making Shingles. Can. patent No. 211,667, THE ROOFING PATENTS COMPANY, Buffalo, N.Y., assignee of A. S. SPEER, Chicago, Ill., both in the U.S.A., May 17, 1921. Claim allowed 1. Also Can. patent No. 21,668, claims allowed 3. Also Can. patent No. 211,669, claim allowed 1.—A. P.-C.

K-21. Roofing Material Manufacture. Can. patent No. 211,895, THE C. F. BURGESS LABORATORIES, assignee of HOWARD F. WEISS, both of Madison, Wis., U.S.A., May 24, 1921. Fibrous material is shredded in air and the shredded material is deposited on a support to form a layer of the desired thickness. The layer is then subjected to the action of an air current to mat the fibers together; and the mat thus produced is passed through pressure rolls into a bath of an appropriate saturant and compressed, and a weather-resistant coating is applied to one of the surfaces of the saturated and compressed mat. Claims allowed 18. —A. P.-C.

K-23. Method of Stone Surfacing Fibrous Materials. Can. patent No. 210,457, THE UNIVERSAL METAL LATH AND PATENT COMPANY, Jersey City, New Jersey, assignee of WILLIAM C. CORYELL, Youngstown, Ohio, both in the U. S. A., April 12, 1921. A method of waterproofing and fireproofing relatively porous sheet materials having an oily combustible base which consists in first rubbing a dust of waterproofing substance into the interstices of the relatively porous base, and subsequently applying a coating of liquid artificial stone compound to the dust impregnated base. Claims allowed 6.—A. P.-C.

K-23. Non-absorbent Fibrous Material. Can. patent No. 211,427, THE CORNELL WOOD PRODUCTS COMPANY, Chicago, Illinois, assignee of FREELAND JOHN MORRISON, Cornell, Wisconsin, both in the U.S.A., May 10, 1921. The process of impregnating fibrous or absorbent material consisting in coating the same with a solution containing 3 to 15 percent by weight of noncrystalline inorganic material, 1 to 7 percent of an organic adhesive, and 1 to 8 percent of a filler, and subsequently compressing the material. Claims allowed 3.—A. P.-C.

K-23. Paper Towel. Can. patent No. 211,717, CONRAD M. CONRADSON and PRENTICE CONRADSON, co-inventors, both of Madison, Wis., U.S.A., May 24, 1921. As a new article of manufacture, a paper sheet having its surface crushed or broken to expose the raw edges or ends of the fiber and facilitate the absorption of moisture. Claims allowed 2. Also Can. patent No. 211,718. A paper towel having a series of perforations, the edges of these perforations being pressed outwardly upon opposite sides of the towel. Claims allowed 3.—A. P.-C.

L-4. Machine for Forming Shells of Paper. Can. patent No. 211,441, THE NATIONAL PAPER CAN COMPANY, assignee of EDWIN FRANCIS HULBERT, both in Milwaykee, Wis., U.S.A., May 10, 1921. Claims allowed 28.—A. P.-C.

L-5. Reactions of Natural and Artificial Silks. M. FORMHALS. **Ann. de Chim. Anal.** (June 1920); **Rev. Chim. Ind.,** xxix 351 (Nov. 1920). The following reaction is applicable to loaded silks. The sample is first dissolved in concentrated sulphuric acid. Part of the solution is rendered alkaline with soda, and is treated with a mixture consisting of paranitraniline, hydrochloric acid, and sodium nitrate. Natural silk gives a red coloration, and artificial silk a yellow coloration. —A. P.-C.

L-6. Moulded Cellulose Articles. Can. patent No. 211,950, LA SOCIETE FRANCAISE DES CRINS ARTIFICIELS, assignee of MAURICE OLIVIER, both of Paris (Seine), France, May 24, 1921. A moistened sheet of pure cellulose is applied to a metal mould, which is first heated to a suitable temperature so as to dry the cellulose, and then cooled so as to enable the cellulose article to be withdrawn. Claims allowed 1. —A. P.-C.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 17th Sept.—Speaking, the other day, with one of the most prominent men in the paper industry in Ontario, the writer was pointedly reminded by him of the inadvisability, when looking over the situation in the industry, of instituting a comparison between business doing now with that doing last year. "Last year," he said, "saw business in the pulp and paper trade at its peak. When we shall see again a business year of such heavy volume, we cannot say—but probably it will not be soon. But, in spite of all the talk about abnormal and subnormal business, this year, it is a notable fact, that the returns of exports for the four months ending the 31st July last are well ahead of those for the same period of the year before last. For example, for the four months ending 31st July last, we exported paper to the value of $21,354,564 as against $17,532,409 for the same four months in 1919; pulp to the value of $8,976,685, as against $9,534,827 for the same four months in 1919; and wood to the value of $3,704,327, as against $3,260,241 for the same four months in 1919. So that, although our total exports for April, May, June and July of this year are very much less in value than those for the corresponding period of last year, they are very much ahead of those for the corresponding period of 1919 which is, for many reasons, a much fairer year with which to compare the current one.

There is no question but that the general election, which will so shortly be upon us, will give a considerable fillip to certain lines of the paper industry. In this respect, that industry will certainly enjoy "preferential treatment." For, in a general way, it is an axiom among business men, that an election period is detrimental to business. It is a period of uncertainty and unsettlement. Adherents of any party are unwilling to launch out commercially until they know for certain whether the country is "going to the demnition bow-wows" (to quote the immortal Mantalini) or not. Many men prominent in business life give their attention ot the platform, the party organization, or what not. But paper plays a prominent part in election and electioneering. There are the posters, the circulars, and so forth, which make a considerable demand on paper, and there are the envelopes and wrappers which carry electioneering literature to all quarters of the Dominion. Not least important is the increased demand on newsprint. Manifestoes of political leaders, speeches of political candidates, and so forth, —all these have to be printed. Political matters bulk big in the advertising columns of the papers. For more and more, it is becoming the curtain for the papers to insist on advertising rates for statements and programs of policy that formerly used to be given, in more abbreviated form, as news.

The past week has not seen much change in the business aspect of the industry. But such change as there has been has been for the better. On the whole, it looks as though the present month will turn out to have been a very fairly good one in most lines.

KRAFT.—Mills manufacturing kraft continue to do a good business. The writer was told today by the representative of one of the largest of them that orders are coming in well and are well distributed from all parts of the country. Within the last few days, it was said, there has been a distinct improvement.

BOOK PAPERS.—There is some upward movement in the demand for book papers, and this looks likely to be increased in the near future.

TOILETS AND TISSUES.—Mills making toilets and tissues are satisfactorily busy. The reduction of ten cents a pound all round, of which mention was made last week, was necessary, so the writer has been informed to meet external competition of a rather unpleasant kind. An encouraging sign of the times is that many retail traders, who had temporarily discontinued the use of waxed papers for their goods, are taking to it again.

BOX BOARDS.—The present season of the year is one in which an expansion of the business in box boards is looked for, and there are signs that they are beginning to move in somewhat better volume than has been the case lately.

NEWSPRINT.—Canadian newsprint men are certainly disposed to deduce from the special report recently published by the Canadian Pulp and Paper Association, which showed an increase of 11,982 tons in the exportation of newsprint from Canada to the United States, for the month of July last, as compared with June, that the situation as to their American market is still favorable. It is generally felt, too, that the adoption of the price of four cents a lb. f.o.b. mill, for newsprint for the quarter beginning the 1st October, will have satisfactory results. It is expected that this price, while allowing the companies a fair profit, will considerably increase the volume of business. There are some other factors in evidence which should undoubtedly tend to stimulate the consumption of newsprint by way of export. For example, many newspapers in the United States have reduced their price from three to two cents, and there are quite a number of new papers starting up. This sort of thing gives some ground for the belief that the demand for newsprint will increase.

PULPWOOD.—There is little demand for pulpwood. The reason for this is that the larger mills are already amply stocked—if not overstocked. Most of the cutting that will take place this fall will only be for wood actually requisitioned by mills.

PULP.—There is little change in the pulp situation as recorded last week. The demand is, on the whole, sluggish, and prices are practically unchanged.

NEW YORK MARKETS.

New York, September 17.—(Special Correspondence). —An appreciable advance in quotations on box boards has featured the markets in New York this week. Mills in the East have raised prices on plain chip boards to between $32.50 and $35 a ton f.o.b. New York, and some are reported asking up to $37.50, while news board has advanced to between $35 and $40 per ton. These prices represent quite a rise over the market levels of $28 a ton on chip and $30 on news prevailing up to a few days ago, and it is said that the advances have attracted



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a good deal of additional demand, there being considerable speculative buying by box manufacturers as a result of the higher prices.

The advance in board values was not unexpected. This is the season when consumption of board increases, as paper box makers are busy turning out boxes for the pre-holiday trade. The basic reason for the rise in the market on this occasion, however, has been that of a sharp increase in prices on old waste paper, which constitutes the major raw material used by board mills. Quotations on box board for some months gradually moved down until manufacturers commenced to complain of a lack of profit in selling board at the low prices reached. It was therefore expected when paper stock costs mounted that board prices would rise.

Another branch of the market showing more strength is kraft wrapping papers. Demand for this kind of paper has increased substantially, and with mills having a great deal more business on their books they are becoming firmer in their attitude regarding prices. Practically all manufacturers have increased their quotations on No. 1 domestic kraft to 6 cents per pound f. o. b. New York, and on the No. 2 grade to 5.50 cents, and jobbers report mills as holding firm for these prices. It is stated on good authority that kraft mills have from two to three months orders on file, and that in frequent instances difficulty is being experienced by buyers in obtaining the deliveries desired.

Book papers continue quiet. While newsprint, wrapping, tissue and board mills are fairly well supplied with orders, book paper manufacturers are still sorely in want of business. Naturally under the circumstances prices rule easy. Manufacturers are competing for such business as is available and are often shading quotations in order to land business. Instances are cited by jobbers where they have bought machine finished book paper of a good quality down to 5.75c a pound f.o.b. New York, though it can be said that a more average price today is 6 cents. The cause of the slow demand for book papers apparently is the situation in the printing trades. Printing has come down but slightly, if at all, in cost, and the industry consequently is suffering from inactivity. The result is that printing plants are not absorbing anywhere near their normal volume of book papers.

Tissues are firm and in good demand, with an especially steady call for tissue specialties such as towels, napkins and toilet papers. Prices on No. 1 white tissue range between 80 and 90 cents per ream f.o.b. New York, with No. 1 manila and No. 2 white, which are of larger size than No. 1 white, quoted at about the same prices as the latter.

The newsprint situation exhibits little change. There is a fairly good demand, with publishers seemingly showing more interest in spot purchases at the moment than in contract supplies. This is probably because spot newsprint is available at slightly cheaper prices at present than paper bought on contract for delivery prior to October 1st, when the revised contract basis at a lower level becomes effective. Spot quotations range around 4.50 cents per pound at the mill, with occasionally sales reported at a quarter of a cent less, while some foreign newsprint is being marketed in this country at even lower figures than this.

Fine papers show a firming tendency. Demand is gradually improving and prices appear to be settling at something like stabilized levels. The purchase of imported sulphite at low prices has enabled some producers of writing papers to mark prices down on their product to a point where a good deal of buying interest has been stirred up, and indications are that fine paper mills are now securing a larger volume of business than in a lengthy period.

GROUND WOOD. — The market for ground wood is steadily stiffening as available supplies appear to be becoming lower and as demand gradually assumes a broader scope. Tissue paper mills are absorbing good amounts of ground wood in conjunction with fairly heavy buying by newsprint and board mills, and the situation as a whole is characterized by considerable activity. No change of note is reported in quotations, which continue to range around $29 or $30 per ton at pulp mills for prime spruce ground wood, freshly ground, of domestic origin, with the delivered consuming point basis generally working out at an average of $35 a ton. Reports from producing centres tell of grinders having a great deal of trouble in operating because of low water in mill streams, and there are no signs of an end to the drought as yet.

CHEMICAL PULP. — In so far as regards domestic chemical pulps, the market still rules quiet, there being but a slight demand for domestic pulp except for contract customers, and prices on such grades are very unsettled. Foreign pulps, on the other hand, are in comparatively good demand. Paper and board mills are placing orders for fair tonnage and evince much interest in all the offerings made. Prices on some kinds of imported pulp have stiffened. Swedish manufacturers are quoting higher and seem more independent for their quest in America. Swedish bleached sulphite is held for 4 cents per pound landed here, No. 1 unbleached sulphite at 2.75 cents and kraft at 2.25 to 2.40 cents. Offers from German sources, however, continue to come forward at low rates, it being reported

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that German bleached sulphite of No. 1 grade is available at 3.70 cents per pound on the dock here, unbleached sulphite of No. 1 quality at 2.40 cents and No. 2 unbleached sulphite at around 2.25 cents. Importers are being obliged to give a bond on practically all the pulp brought from Europe at present, and this promotes caution in the bringing over of supplies. Just what will be the outcome of the anti-dumping situation is a question. A good deal of opinion pro and con on the subject is being advanced and printed; nothing of a definite character has yet been reached.

RAGS. — The papermaking rag market fails to show the increased activity that is apparent in other branches of the papermakers' supply trade. While demand for some kinds of new cuttings has improved a bit, generally speaking the situation is marked by quietness, and prices remain at approximately the same levels that have obtained for some time. Dealers are becoming more bullish in their views and are not pressing buyers as much as they were, yet consumers looking for rags are mostly buying at such prices as they choose to offer. This condition applies especially to roofing rags. There are only two or three felt mills buying in worthwhile volume and they are securing No. 1 roofing stock at about 80 cents per hundred pounds at shipping points and No. 2 packing at 70 cents or thereabouts. Old thirds and blues, repacked, are quoted at 1.50 to 1.75 cents, repacked old No. 1 whites at 4.25 to 4.75 cents, miscellaneous old No. 1 whites at 3.50 to 3.75 cents, black stockings at 1.50 cents, cotton quilts at 85 cents, and street soiled whites at one cent per pound. New No. 1 white shirt cuttings are rather firmly held by dealers at 8.75 to 9 cents a pound, fancy shirt cuttings at 4.75 cents, new unbleached muslin at 8 cents, white lawns at 7.75 cents, blue overall cuttings at 5.75 cents and new No. 1 washables at 3.50 cents.

PAPER STOCK. — The advance in waste paper prices has continued this week and additional enhancement of values on most grades has been noted. Dealers and packers are quite independent in their attitude and are frequently refusing orders for large tonnage with the excuse that material is so difficult to locate in sizeable volume that they do not deem it wise business judgment to contract for large lots. Old books are jumping in price at a rapid rate, and some dealers are now asking 1.50 cents a pound for No. 1 heavy books and magazines at shipping points, though most of the week's business has been done at around 1.25 cents. Hard white shavings of No. 1 grade are quoted at a minimum of 3.25 cents a pound f.o.b. New York, and No. 1 soft white shavings at 2.60 cents, while old kraft paper is held for 1.90 cents and white news cuttings for 1.75 cents. Folded newspapers have advanced to an average of 70 cents a hundred at shipping points, and No. 1 mixed papers to 50 cents. From all signs, there is an actual scarcity of waste paper. Of course, the higher prices have stimulated collections of low grades, but packers declare that extra efforts to obtain larger quantities of shavings, books, and such grades fail to bring results owing to the slow operations of printing establishments.

OLD ROPE AND BAGGING. — Old manila rope is firming in price and there have been sales to mills reported at 4.25 cents a pound f.o.b. shipping points, although most transactions continue to be at nearer the 4 cents level. Old bagging is firmer in tone but prices hold unchanged, with No. 1 scrap bagging quoted at from 75 cents a hundred upward, roofing bagging at 60 cents and scrap gunny at 90 cents to $1.

ABOUT BALL BEARINGS.

Bearing performance and bearing life may be said to have a highly important influence on the output of pulp and paper machinery. For it is generally admitted that production depends on the consistency of machine operation. And consistent, steady running can be most reliably maintained on a machine in which the elements of moving contact are designed for the least trouble and the longest life, that is to say, for least friction.

It is for the reason that, in properly designed ball bearings, internal friction — and therefore wear on the bearing itself — is reduced to a minimum that they are of such value, in use at vital points of wear, in securing maximum tonnage life. For, as soon as the bearings on paper making machinery, from barkers to cutters, show wear, destructive vibration is set up, with the result that operating costs become higher per unit of pro duction and that the machine's life is, almost always, materially shortened.

Recognizing this, paper-making machine manufacturers are supplying the ball type of bearing on their most important units, and at points where greatest wear would be shown with bearings on the plain or sleeve type. Further, many of them are turning to the SKF marked ball bearings, for the purpose of building longer life into their product. The success of these ball bearings is evidenced by their standardized use in many makes of pulp and paper machinery, both in this country and abroad.

A paper machine with self-aligning ball bearings has been running at 1,000 feet per minute. This record making machine is equipped with ball bearings on the complete line and floor drives, table, wire and carrying rolls as well as press felt and dryer felt rolls. It was stated that "the success of this machine depends in no small measure upon the use of the SKF marked self-aligning ball bearings to eliminate friction."

The SKF ball bearings are produced by the Canadian SKF Company, Ltd., of Montreal and Toronto.

WAGES LOW IN THE WOODS.

The Department of Lands and Forests of Quebec makes the following predictions regarding the outlook for lumbering, and the pulp and paper industries:

"We expect that lumbering operations will be very good in the Ottawa district (where pine is the feature of the cut). Elsewhere the cut will be rather small, owing to the poor demand for spruce and pulp wood.

"The activity of lumbermen will be directed especially towards the removal of burnt material. In fact, during the last five years the utilization of the dead material has become so intense that the total cut of burnt trees, windfall trees and insect-killed trees, etc., amounted to close to twenty-five per cent of the cut on Crown lands.

"We have no information about the cut on private lands, but since there is no demand to speak of for pulp wood, the cut will be rather small.

"Wages as far as can be learned at this time, will be about $25 to $40 a month for lumberjacks. It is on record that in one district men have agreed to work for as low a figure as $17 a month.

The dome of the famous Palace of Justice in Brussels is made of papier-mache.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., September 29, 1921. No. 39

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

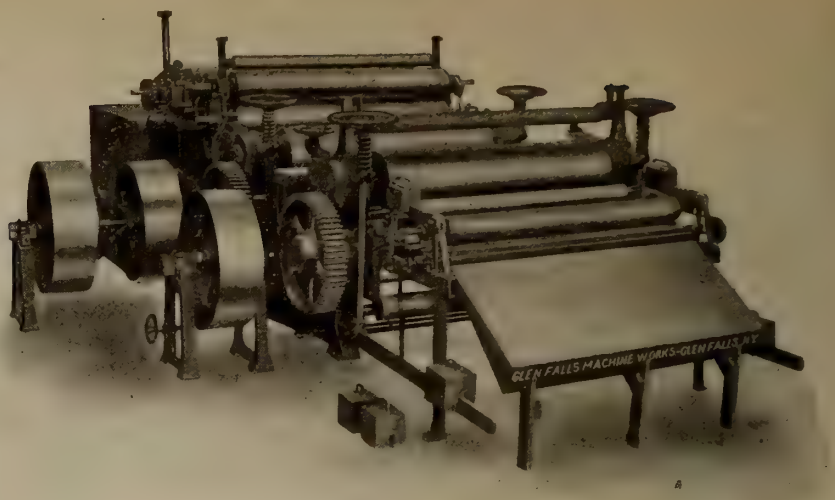
J. NEWELL STEPHENSON, M.Sc. Editor.

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EDITORIAL

GIVE THEM AS GOOD AS YOU GOT.

There is no difference of opinion among leaders of business and industry as to the fundamental qualification for the attainment of success in and satisfaction from, life. It is character that counts most. Wealth, health, education, social position, inherent ability, none of these can, of themselves, possibly be considered as the foundation of a worth-while life. Ask any employer of men what he most desires and, in the great majority of cases, he will name some quality that is but another name for, or is dependent on, character. He may call it honesty, reliability, trustworthiness, or something of the kind, but he means character.

The men who have done the most for their generation, who have rendered faithful service in even humble positions, who have made sacrifices for others—they have had character. Where did they get it?

The biography of nearly every man of prominence and accomplishment begins with a few words about his father and mother and a brief description of his early home life. The life story of the criminal and the failure usually begin the same way. Why? It is because the influence of the father and mother and the atmosphere of the home are the most potent influences on the lives of each succeeding generation. It is true, sadly true, that all boys and girls do not follow the example and precept of exemplary parents; it is happily true, also, that some boys and girls rise above the sordid standard of immoral and intemperate homes. It is, nevertheless, a fact that plants—and children—grow best when started in good soil.

What man will hesitate to ascribe what good there is in him to the influence of a Christian father or mother or friend? What man is getting any great satisfaction from his life who has not felt such an influence? Certainly none of our readers. Yet how many of us are passing on the warmth, the cheer, the encouragement, the inspiration of such an influence to the younger people about us? If we are not, there is one reason; we have turned our backs and closed our hearts and dulled our senses to the greatest force and factor in the life of the world—the spirit of Christ. If we are reflecting light, love, and life to those around us, there is one reason; we are living close to Him and getting the power that makes us men; we are connected to the source of true character. We must, each one, be of one kind or the other—a sponge that soaks up and rots or a channel that carries the water of life; a black body that absorbs every ray, or a reflector that sends a beam of light down the pathway of this one or that.

We all got the benefits of character from the elders of our early days; some at home, some at school, some at Sunday school. These are many men today who demand character in those they employ and expect it to be developed in their children and yet are so living that their influence is mostly on the other side. They call for temperance and vote for prohibition, and keep a bottle on the shelf. They call for honesty and put a fellow-man out of business or "fix it" with those in authority. They decry the impotency of the Church and play golf on Sunday and do nothing to help energize this great instrument of God. They bewail the failure of Christianity and ignore the Golden Rule.

How are we to have honest, faithful, helpful men and women if we don't teach the children, by precept and example? There are three great agencies for developing character, the home, the school and the Sunday school. Each has its own place and all are needed. The function of the home is principally to furnish the example; that of the school is to train the mind to read and reason; that of the Sunday school is to impart a knowledge of the word of God and to inculcate the fundamental principles of Christian character. Most of us had the benefit of all three. Are we doing our part in passing along by helping, through personal service or otherwise, as good as we got?

A GOOD TIME TO BEGIN.

The year 1921 will be remembered by those most interested in forestry operations as a *bad fire year*. The spring and summer have been unusually dry and the loss of timber has been great, partly in destruction of nature trees but especially in the destruction of young growth, the hope of our mills 10, 20, 30 and 40 years from now. The litter of slash from logging operations is largely responsible for the conditions that made it possible for a fire to start — a green forest does not take fire readily. Now is a particularly favorable time to start a properly planned system of slash disposal. Operations this year will be on a reduced scale. Wages are lower than for several years and there will not be the demand calling for rush operations with small crews. Plenty of experienced woodsmen will be available, and, with a little inspiration and education, will catch the spirit of conservation of their means of livelihood.

SECOND INTERNATIONAL NUMBER.

The second annual International number of the Pulp and Paper Magazine is now in preparation. Copies will be sent to regular subscribers who send in their requests before Oct. 21. After that date and to non-subscribers, the price will be $1.00.

NEW BULLETIN ON SITKA SPRUCE.

The Forest Products Laboratories of Canada, under the Forestry Branch of the Department of the Interior, are making a systematic study of the mechanical and physical qualities of all of Canada's commercial timbers. As each study is completed, the results are issued in bulletin form, and these bulletin are sent free to all citizens interested, upon application to the Director of Forestry, Ottawa. The object, of course, is the more complete and efficient utilization of all Canada's native woods at home and a better appreciation of their qualities among engineers, builders and manufacturers abroad, so as to encourage export. The bulletins so far issued in this series are No. 59, "Canadian Woods for Structural Timbers," and No. 60, "Canadian Douglas Fir: Its Mechanical and Physical Properties." Copies of these bulletins are available for free distribution.

The latest of the series to be issued is No. 71, "Canadian Sitka Spruce: Its Mechanical and Physical Properties." The importance of this wood in connection with airplane construction, and other uses recently discovered for it, is the reason for the issue of this study at this place in the series. This bulletin will not be issued for a month or six weeks, but any applications for copies will be dealt with as soon as the edition is received from the printer.

The author of Bulletin No. 71 is L. L. Brown, B.Sc., A.M.E.I.C. formerly Superintendent of the Vancouver Laboratory, Forest Products Laboratories of Canada.

A few paragraphs from the advance proof of the bulletin will be of interest.

Sitka spruce is found along the Pacific coast from northern California to Alaska, seldom extending back more than fifty miles from salt water and reaching its best growth in constantly moist, deep, rich soils in a humid atmosphere.

"It is generally distributed throughout the western slope of the coast mountains and on Vancouver and Queen Charlotte islands.

"Though Sitka spruce is one of the most valuable trees in the province, it is unfortunately not very abundant. Less than 7 per cent of the merchantable stand on the coast is Sitka spruce, most of which is to be found in the northern coastal region extending from about the head of Vancouver island to Portland canal and including Queen Charlotte islands.

"Sitka spruce is one of the largest trees on the coast, attaining a diameter of from 8 to 12 feet and a height of from 160 to 180 feet. Ordinarily it is from 3 to 6 feet in diameter and 100 to 125 feet high. When grown in fairly dense stands the trunk is usually clear for from 40 feet to 80 feet and tapers very little till the branches are reached. Single trees contain from 8,000 to 10,000 feet board measure and occasionally as much as 15,000 feet board measure. It seldom occurs in pure stands, but in mixture with hemlock and balsam, or with cottonwood, it frequently runs from 40,000 to 60,000 feet board measure per acre." ("Forests of British Columbia," Whitford and Craig.)

In the publication just mentioned it is estimated that there are over fourteen billion feet board measure of Sitka spruce in British Columbia.

Annual Cut.

The annual cut of Sitka spruce in British Columbia for the past few years has been as follows: in 1916, 68,263,000 feet board measure; in 1917, 92,963,000 feet board measure; and in 1918, 239,787,000 feet board measure. The wood, straight-grained, easily worked, and very strong for its weight, was greatly in demand for airplane construction during the war, as is evidenced by the fact that 26,124,000 feet board measure were produced in British Columbia for airplane purposes during 1918, 6,850,000 feet board measure being produced during November of that year.*

Increasing Use of Sitka Spruce.

Sitka spruce was practically unknown outside the Pacific coast before the war, and it owes its popularity largely to the advertising it received at that time, and also to the fact that large stocks were left after the war, which stocks were sold to woodworking factories. Of course, where it was known Sitka spruce had long been used for cooperage, boxes, both solid and veneer, and for framing and interior trim in house construction and office bulidings, but of late eastern factories have beguni to use it in the manufacture of sashes and doors, ice-cream tubs, tank stock, kitchen tables, breadboards, boats, spars, oars, paddles, billiard table frames, and for core-stock, back posts, and soundingboards for pianos, diaphragms and horns for phonographs, wagon sides and bottoms, car stock, and ladder stock.

Conclusions.

Sitka spruce grown on the Queen Charlotte islands is stronger than that grown on the mainland in southern British Columbia (as represented by a stand near Kings, British Columbia) by approximately 3 to 14 per cent, based on the former, in the case of the more important tests.

The Sitka spruce grown at Masset Inlet, Queen Charlotte islands, is of nearly identical strength properties with that grown at Thurston Harbour in the same islands, the slight difference being in favour of spruce from the latter place.

The variations from the average results are large in this as in other woods, and where a definite strength is demanded it can be established only by determining the density of the piece in question.

The density of Sitka spruce is not readily apparent, owing to the similarity of color of the spring-wood and summer-wood and to the gradual transition from one to the other, so that a visual method of determining density by esimating the proportion of summer-wood is not practicable. Resort must be had to actual measurement.

The strength of Sitka spruce increases from the pith to the periphery in trees of the size tested (the largest tree was more than 5 feet in diameter), the weakest wood being near the centre.

The strength of small clear pieces of Sitka spruce increases very rapidly when dried below the fibre-saturation point, which is at approximately 31 per cent of moisture, based on the dry weight of the wood. Any increase of moisture above the fibre-saturation point does not influence the strength of the piece.

By the use of curves, derived from the results of tests, showing the relation between density and the various strength functions, the strength of any piece of clear Sitka spruce can be very closely estimated if its density is known.

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* Reports of the Forestry Branch, British Columbia, for 1916-17-17.

Selling Scientifically and Manufacturing Methodically

By T. J. BURKE, C. A., Secretary-Treasurer, Cost Association of the Paper Industry.

"The right goods at the right price" is a sign which I have noted frequently of late as appearing in the windows of many stores. It is a notice that strikes at the very root of things. The jobbers and retailers advertise as having the right goods at the right price, but what about the manufacturers? What steps do they take to make sure that they have the right goods at the right price? Taking your own case for example, are you satisfied that your products can be considered to be within this category? Not only, are you satisfied that they may be so considered, but are you absolutely sure that this is the case? In order to be quite sure you must have reliable figures, and now, to come to the climax of the matter, have you these reliable figures? What is your policy regarding your products? How have you formulated this policy?

In these days when business has to be stalked as carefully as one would stalk a deer, it is absolutely essential that every scientific aid possible shall be used. Up-to-date cost systems are essentially scientific aids to business, their usefulness lying in the fact that they help manufacturers to sell scientifically and to manufacture methodically, by enabling him to push, through his sales department, those goods on which he makes the most profit and to control through his production department, his output, so that it will keep pace with the sales made.

Paper must certainly be considered one of the so-called fundamental commodities today, and the only trouble with these commodities has been very largely one of price. Certainly the demand for paper has fallen off, but as stated above, it is a fundamental commodity and there must always be what might be called a basic demand which must be supplied. This basic demand has undoubtedly been kept at its lowest possible ebb, mainly on account of the general distrust of prices.

It is absolutely necessary that prospective purchasers be made to feel that prices will not go lower and that therefore their competitors will not gain any advantage over them by waiting a little longer. In other words, confidence must be inspired in prospective buyers. The dictionary definition of "confidence" is given as "trust" or "reliance." I ask the question, how can prospective purchasers be expected to put reliance in the prices quoted when there are such big variations and so many changes. Undoubtedly some of these changes are due to what may be called fundamental reasons, but many of them are due to a desire to get business at any price and therein lies the danger. To build up "confidence" is one thing, to play the "confidence-game" is another. To go back to the dictionary, the definition given of "confdence-game" is a swindling scheme to get money. That's rather a strong expression to use in connection with the manufacturers who sell their products below cost, but if we give the matter serious attention and consideration, it would appear that the term "confidence-game" approaches very closely what they are doing. They are attempting to build up confidence by resorting to unfair methods of business, for manufacturers who sell their products at less than cost price are resorting to unfair methods of business, inasmuch as they know quite well that there must come a time when they will no longer be able to sell on the same basis. What they hope to do is to secure business at the lower basis, and then, after having lulled the purchaser in a feeling of security, to gradually work on to a high price basis.

That manufacturers may sell their products at slightly below cost with the hope of keeping their organization together and taking care of their overhead thereby eliminating the heavy cost of shutting down is, of course, perfectly legitimate, but what might be termed illegitimate competition is competition from manufacturers who do it nevertheless, simply because they do not know what they are doing. How can they know, since they have to wait until perhaps the end of a six months' period before they can state definitely whether they have made a profit or a loss? In the meantime, by means of rule of thumb methods, they endeavor to ascertain how things are going. Naturally such a method breads fear, and a man who is afraid of what may be in store is not in a position to use his best business judgment. He generally decides that whatever else he does, he must keep the mill running. He feels that as long as there is something to do, that he must be better off than he would be if he were shut down altogether, because then his equipment would be idle and earning him nothing, whilst as long as his machines are running, even only part time, he feels that they are earning something for him. What he overlooks is the fact that whilst he would be losing his fixed charges and could not expect any interest from his investment whilst his mill was shut down, yet the goods that he manufactures and sells may mean a much bigger loss to him at the prices he quotes, inasmuch as the cost of the raw material and labor which he has to put into those goods may not all come back to him but only a part thereof and his loss will thus be increased.

Knowledge Is Power.

These are very simple facts known to a great many and yet there are still manufacturers who are not convinced of the benefits which they would derive from an up-to-date cost system. They much prefer to take these big risks, because forsooth they might have to add the expense of two or three extra clerks and one good cost manager. Knowledge is power, and a proper knowledge of your production costs must and will mean a better ability to do business. Right here I would like to urge the necessity for a really up-to-date cost system. Such methods for instance as "distributing overhead expenses in accordance with the percentage of direct labor" cannot be called scientific nor reliable. I therefore urge all manufacturers of paper when taking up this cost question to make a good job of it and to get the best possible advice. Do not employ a cost man because a friend told you he was a good bookkeeper. Very big strides have been made by cost accountants in recent years and the leaders amongst them are very far-seeing clever accountants.

Strangely enough, manufacturers have never had to be persuaded very strongly, of the necessity for getting

Education.

Behind all this is a simple process of "Education"—eradicating wrong ideas by educational methods. Take the heading "Education" in the chart. I know of a paper mill where Technical Work is very closely followed and the workers are helped in practical work, as well as music, dancing, industrial history, and business routine. Results are published in the Works Magazine and this is what one may often read, as an example:—In the suggestion box not more than 50 suggestions, dealing with various subjects, were received. The one sent in by "Mr. So-and-So" is an old one and was rejected. "Mr. So-and-So's" suggestion for the present improvement in the machine-room, which means economy, is rewarded by a payment to him of £20." The suggestion box makes the workers think and incidentally the mill reaps the benefit, not only of the improvement, but in having a thoughtful employee.

There is another mill, which under the heading of "Progress," has a chart fixed on the wall of the machine-room. It is closely scrutinised by all who work in it and from one end of the week to another end the policy of the workers in that machine-room is to keep the output increasing so that each month will show an increase on the previous month. This chart, I am told, works like magic on the men. They get interested in it and at the end of 3 months their figures on the chart are recorded in the Works Magazine with a comparison of what was done in the previous 3 months, accompanied by a statement explanatory of the rise or fall as the case may be. In some mills where two or more machines are working there is a system of encouraging the machine-room with monetary prizes for increased output.

The Social Side.

Nearly all the British paper, board, and paper bag mills have their own social committees, either under the Works Committee, or, if there is no Committee, a representative one of the mill is elected. Dancing is encouraged, sports of all kinds, and various forms of entertainments. A summer's day outing at some favorite country spot, where there is plenty to eat, or at some well-known watering resort, is one of the year's fixtures and many a time I have seen all the mill, from the highest official down to humblest worker, board a train bent on a good day's pleasure, the cost of which might be borne by the Committee collecting a small weekly subscription.

The Holiday Fund, which comes under the heading of "Thrift," is not the only Fund. Some mills have Sick-Benefit clubs, or a fund to keep invalids in Convalescent Homes. The Sick-Benefit club is run by a small committee, the members of which collect each week a small amount of money to help any worker in the mill—by means of weekly payments—during his or her enforced absence from work. Then during the days of convalescence the invalid is sent away to a convalescent home for a change of air and further medical treatment. These two phases of Welfare Work are invaluable in the British mills.

Another social element is the annual dinner of the mill workers when they sit round the festive board along with the management and directors. But probably the most unique event is the departure of Foreign Travellers, who are usually entertained by their Principals before leaving England's shores to sell the products of the British Paper Mills. The occasion is marked out for friendly conversation and the clearing up of any little incidentals appertaining to the visitation abroad.

Savings Bank and Health.

The Savings Bank and Thrift are always advocated in the mills. One instance is worth recording. A certain mill had a Savings Bank committee and each week a certain amount was paid by the workers who desired to participate in the Bank. In the course of time the millowners were making extensions and the workers put their Bank to some use by taking out over £8,000 worth of shares. It will be thus seen that the workers, through the Thrift encouraged by their employers, became shareholders and by the small weekly contribution paid, never missed from their pockets the money so invested. They are now more interested in their work and feel they are working for something tangible, as well as helping their employers.

The question of Health is a big one in the United Kingdom. All sorts of schemes are advocated because it is well-known a man or women in poor health is not helping production. Medical examinations are suggested and an inspection by the Dentist—and they are in use in some places, but not, to say the least, uncommon in paper mills. The great point is to find suitable work for the weaklings. He may be a good beaterman and the firm cannot afford to lose him, or do not like to lose him on account of long service, and then the question often arises: What are we to do with him? It is here the Works Committee often does a good turn, after going fully into the merits and demerits of his case and many a good workman is saved for the firm.

Canteens (caffeterias) and Dining Rooms, where hot meals are provided, are to be seen today in the British mills. I know Canada has some. The British ones are very comfortable as a rule and well looked after.

But notable features under "Health" are cleanliness, ventilation, and visits to the sick. By cleanliness, I mean cleanliness in the mill itself and proper drainage to keep down sickness. Some of the British mills make it a point to report on and visit their workers when sick—and later the sick club committee does the rest. Most mills have a First Aid party in cases of accidents or sickness and very often some good results are achieved.

Another branch of Health work in Industrial Welfare is the Institute, or Hall, for the workers to meet in. There is one paper mill producing newsprint which has a Hall containing refreshment counter, billiard room, games room, reading room and library, facilities for a hot bath, and a swimming bath 50ft. long. This is an instance of what a Hall is like.

Pensions and Other Benefits.

A survey of some of the British paper mills and other concerns would surprise one of the remarkable development of Welfare Work. Some Firms employ an Industrial Welfare Officer who does nothing else but study the workers. Up to the present I have not heard of one being engaged in the paper industry, but I know of plenty in the Textile industry. In the paper trade the Works Committee takes his place, with the help of the millowners.

Probably the best scheme of all is the Pensions. One of the North of England mills has a splendid one initiated by the Managing-Director. Into the Pensions Scheme the workers, of a certain year's service and over, pay, and when they come to a certain age can retire on a weekly allowance to enjoy their days of old age. These schemes vary in mills. Some have a fixed retirement age; others have not. In addition to pen-

sions there are Death Benefit Funds, which afford the relatives of a mill worker when he or she dies, a certain sum of money to cover funeral expenses and a good bit over "to keep the wolf from the door."

Technology and Classes.

Every young man in a paper mill, or paper office—agent, dealer, or merchant—is encouraged to go in for classes and technical study, particularly if he has any knowledge of chemistry. Sometimes the schools are outside the mill and sometimes inside. In the matter of Technical work the British Paper Makers Association has given every encouragement, financially and otherwise, and Education Authorities are always reminded of the fact that papermaking students want tuition, as well as other industrial students. But in the paper mill the young man gets his ground work for the setting and the schools and colleges aid him in his progress.

A reference again to the chart, which covers only some of the subjects, will give an idea of what Welfare Work is like in the United Kingdom at present. No industry can do without it and if properly utilized, mill-owners will reap considerable profit and help. Canadians know so much about "Safety First" I have not dealt with the subject, neither have I gone into the question of charts known so well in the Dominion.

Industrial Welfare Work has come to stay and it is going to cement and promote a better feeling between employer and employee. But to make it workable the mill Parliament must not be a farce, nor onesided, because such vital subjects as dismissals, economy, output, interviewing and engaging new hands must not be played with. It is up to each mill to have its own way—but go the right way about it.

A COURSE IN INDUSTRIAL METALLOGRAPHY.

For several years past there has been given in the Department of Metallurgy, McGill University, an extension course in Metallography which has been attended by Mechanics, Engineers, Chemists, and those desiring a "Hobby" or whose business brought them in contact with metals and who desired to have more knowledge of their composition.

No previous knowledge of the subject is assumed and the course is essentially practical from first to last. Ferrous and non-ferrous metals are dealt with equally and training given in preparing them for examination under the microscope and finally photographing the various structures which develop.

Anyone desiring to enroll should apply to Dr. Alfred Stansfield,Department of Metallurgy,McGill University or to the lecturers Harold J. Roast F.C.S., F.C.I.C., or Charles F. Pascoe, F.C.I.C, both of whom also hold positions with Manufacturers of metal products used in the Pulp and Paper industrry.

The first class will be held on Monday evening, November 7th, at 8.00 p.m. in the Chemistry Building McGill University.

Fee for the course of 15 periods $20.00.

As on ly fifteen members can be accommodated, application should be made at once.

The microscopic equipment has been added to considerably this year, particularly in regard to the photographic end. If any former members desire to continue their work, provision will be made for an advanced class if sufficient members are obtained.

Marriage is a love bond; divorce is a liberty bond.

ABANDON JOINT MEETING OF T. A. P. P. I. AND SUPERINTENDENTS.

Definite action was taken by the Executive Committee of the Technical Association of the Pulp and Paper Industry at a meeting held Thursday, September 15, on the question of continuing with arrangements for holding the scheduled Joint Fall Meeting of T. A. P. P. I. at the American Pulp and Paper Mill Superintendents' Association at Washington and other points during the week of October 18. Word had been received from representatives of the Superintendents Association and the executive of the local committees of arrangements indicating a lack of enthusiasm for the meeting as a consequence of the business depression. The Executie Committee of T. A. P. P. I. was in complete agreement with the officers of the Superintendents' Association in regard to business conditions being unfavorable for a joint meeting at the time scheduled, and on a vote being taken at the meeting on Thursday, it was unanimously resolved to cancel the Fall Meeting. It was, however, the unanimous opinion of all that a joint meeting with the members of the American Puljp and Paper Mill Superintendents' Association was desirable and arrangements will be made for such a meeting at a place and time to be announced later.

The Committee on Service to Members of T.A.P.P.I. of which Fred C. Clark is chairman, is hopeful for obtaining for early publication in the trade journals all reports of committees and papers that would ordinarily have been presented at the oint Fall Meeting. As one of the steps in giving improved service to members. Mr. Clark's committee has issued a questionnaire which members are asked to check according to instructions and return to the Secretary's office without delay.

COST EXPERTS TO MEET IN CHICAGO.

In recognition of the progressive activities of paper mill cost accountants in the Middle West, Chicago has been selected for the annual convention of the Cost Association of the Paper Industry on October 6 and 7. It is the first time in two years that the association has met near the western mills, where some of the most active local divisions are located.

At this convention in Chicago an advance step is planned in the establishment of groups for the unification of cost accounting procedure among those making similar kinds of paper, such as tissue, writing, book and the like.

Because of this plan for the extension of the activities of the Cost Association, there will be a large representation from the east, from the Kalamazoo, Mich., Miami Valley, Ohio and other such districts where there already exist strong divisional organizations.

"In times of prosperity," said Thomas J. Burke, ecreary of the national association, "the need for careful accounting is not so strongly felt. But in times of depression such as those which are happily now passing, the cost accountant proves his value to his employer, for careful cost accountancy may mean the difference between failure and success in business."

How the United Typothetae of America through uniform cost accounting, not only standardized the printing industry, but reduced the whole scale of printing costs to the consumer will be discussed by Joseph A. Borden, formerly with the Typothetae, and other addresses along similar lines will be given by others of equal prominence.

The Structure of Cereal Straws

By FRANCIS E. LLOYD, F.R.S.C. McGill University.

(Continued from last issue)

THE INTERNAL TISSUES.

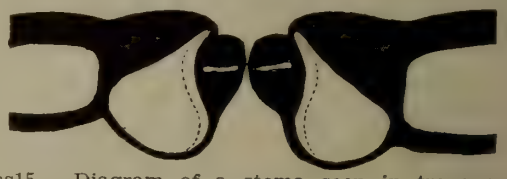
The epidermis encloses a variety of tissues and a still greater variety of their component cells. The latter may be segregated into two groups, according to their dimensions; roughly, those which are rather short **(parenchyma)** and those which are elongated **(prosenchyma)**. These distinctions are made chiefly for the purposes of description, and are used as such. It has been pointed out that the epidermis is differentiated into longitudinal zones ("fluting") which are readily distinguishable by the character of the cells composing them, and most easily by the presence or absence of stomata (figures 6-13). Those with stomata may be called the stomatal-zones for convenience. These distinctions hold for both leaf and stem and with them in mind we may proceed to consider the arrangement of the internal tissues of both.

Internal Tissues of the Stem.

The Chlorenchyma.—Lying just beneath the pore zones of the epidermis are to be found corresponding zones of very thin walled and loosely arranged cells which during the life of the plant contain green coloring matter (chlorophyll) (figure 5, ch). These cells constitute the chlorenchyma which appears merely as green color to the eye, arranged in longitudinal zones. The chlorenchyma is the active seat of starch formation, for which purpose carbon dioxide is necessary. This finds its way by diffusion into the chlorenchyma through the stomata pores. This relation explains the distribution of these pores in longitudinal zones.

The chlorenchyma is best developed in the exposed upper part of the internodes, especially of the topmost slender internode which bears the grain (figure 4). As one descends an internode, the chlorenchyma becomes less and less conspicuous, until near the base it may not be present at all (figures 2 and 3). It has been noted above that there are here very few stomata, corresponding with the absence of chlorenchyma.

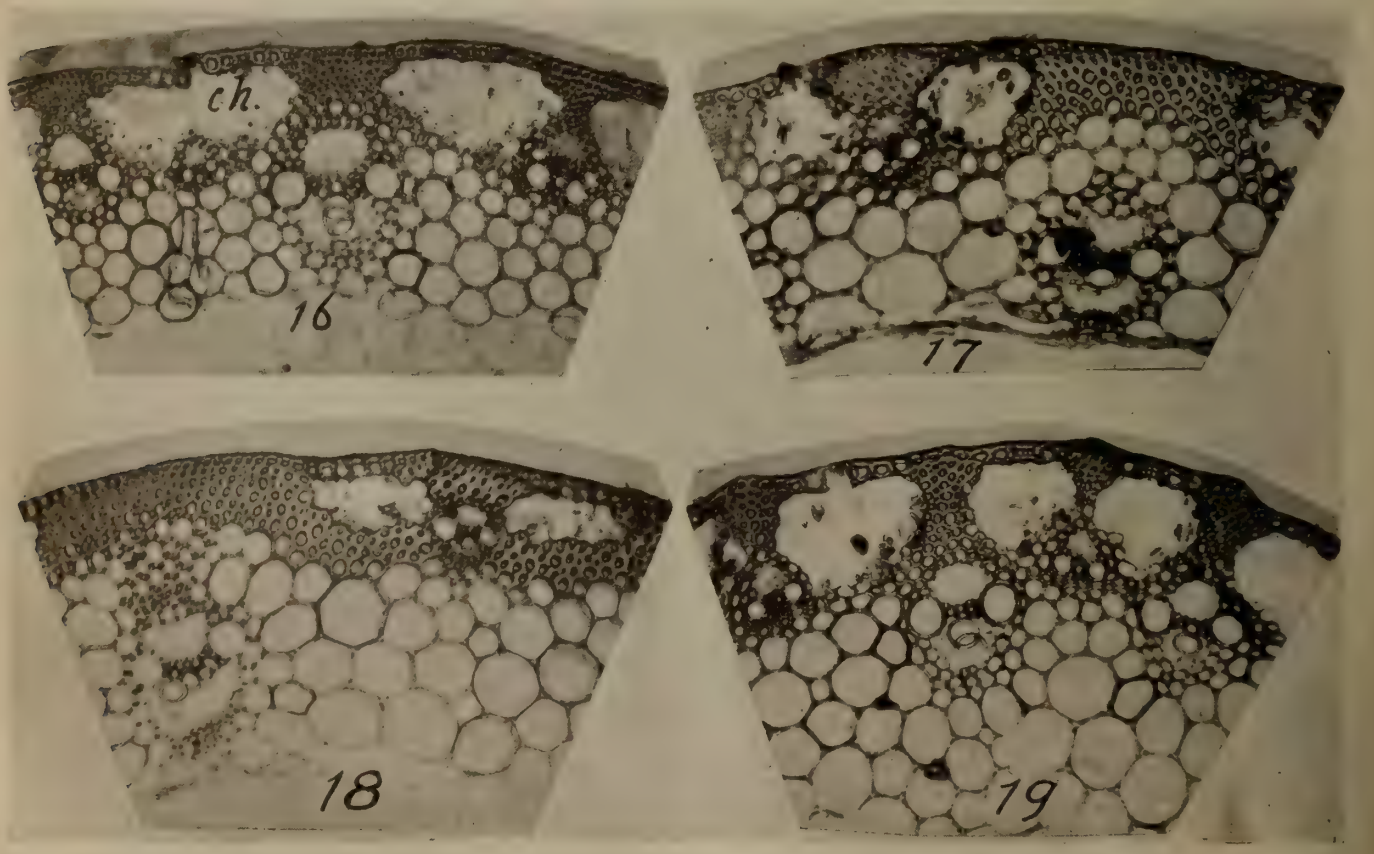
The "fluting" can sometimes be seen e.g. in wheat, by the naked eye to occur roughly in pairs. This is



Figures15. — Diagram of a stoma seen in transverse section, barley.

brought out clearly in a transverse section (figure 4). in which it is seen that the chlorenchyma strips are paired with reference to certain groups of cells (vascular bundles). Sometimes the neighboring strips of adjacent pairs run together, making a group of three; in other instances the spaces between the pairs are equal to the spaces between the members of a pair, so that the fluting is less obviously regular, but more so in some straws e.g., wheat, than in others.

The chlorenchyma in the lower internodes is more tangentially compressed than in the uppermost, is re-



Figures 16-19. — Sectors of transverse section of the terminal internode of barley, oat, rye and wheat, resp. x 146. — Ch., chlorophyll tissue space, the tissue disintegrated in these sections.

latively shallower and is more irregularly disposed. The topography as revealed in transverse sections is fairly characteristic for each of the grains (figures 16-19).

The Zone of Fibres (bast).—The longitudinal zones of epidermis devoid of stomatal pores are on the other hand underlain by a mechanical tissue composed of much elongated cells (fibres). To each zone, and lying just below the fibres, is a vascular bundle (figure 4). According to the age of the stem and to the vertical position, the extent of fibrous tissue varies, it being relatively greatest in the lowermost part of the internode, and bears an inverse relation to the chlorenchyma zones. Here the fibrous tissue underlies the chlorenchyma zones, thus forming a continuous layer of mechanical tissue around the whole stem, having an average depth of about 0.5mm (50 microns) (figures 3, 16-23).

Embedded in this layer is a tangential series of vascular bundles, one underlying each surface ridge and therefore between adjacent flutings. This is the zone of fibres, and it is the material which is chiefly important in paper making, although the other elements occur more or less according to the grade of paper.

The Pith (Fundamental Tissue).

We use this term to embrace all the remaining tissue lying within the zone of fibres, excluding the vascular bundles. The constituent cells are parenchyma about two or four times as long as broad (pa., figure 5), and relatively thin walled. The walls are for the most part however, quite rigid in the dry straw, and they contribute no small share to its mechanical qualities in this condition. Only at the innermost limits of the pith they are soft walled and lax. The condition is due to the dying off of the innermost pith cells as the cavity of the straw is formed during the development of the plant. The condition is well illustrated by the oat (figure 17).

Fibro-vascular Bundles.

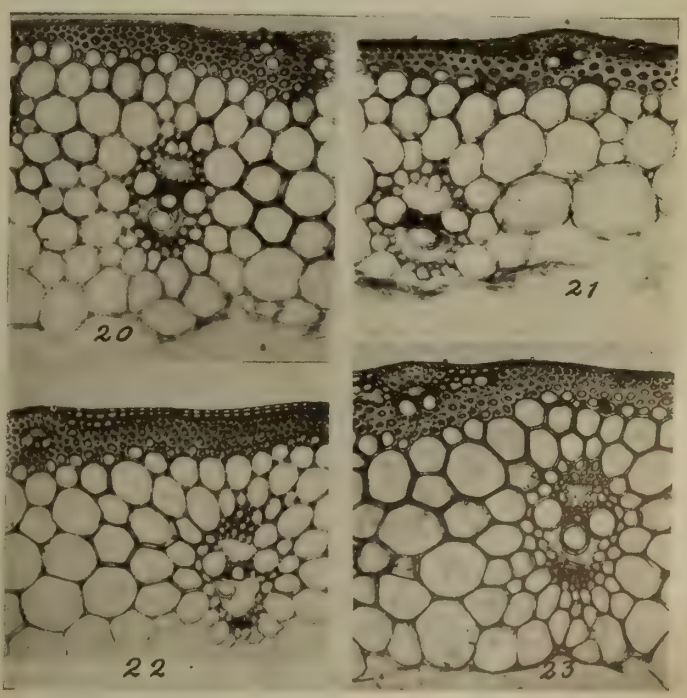
Lying in the pith is a series of vascular bundles of large size.[6] These bundles are of rather complex structure (figure 24), and have for their function the transportation of water and food materials up and down the stem and leaf of the plant. The portion which has to do chiefly with the movements of water is the xylem or wood (vessels) and can be recognized in the accompanying figure as four large openings disposed like the eyes, nose and mouth of the face, and surrounded by cells of much smaller caliber. The small thick walled cells between the eyes are also wood vessels. Most of the wood vessels can be recognized in pulp or macerated material by the numerous slit-like pits in the walls.

The wood-cells are primary and secondary—those first formed during the development of the stem, and those later formed. The first formed have very thin walls strengthened by rings or spirals (figure 5, **x**). With the elongation of the stem during growth the thin walls are ruptured, and the rings are in consequence spread apart longitudinally, as are also the turns of the spirals. In pulp, rings and spirals may both be seen. The secondary wood cells are thick walled, but penetrated by pits which are more or less oval or slit-like in form and regularly disposed in longitudinal series, suggesting the rungs of a ladder (figure 5). The ends of the wood cells are transverse or more or less oblique —at an angle of scarcely more than 45 degrees and are usually open, so that a series of cells make a continuous tube. Between the wood-cells with pitted walls and those which have only ring thickenings, there are various intermediate stages. On the two sides of the primary wood there are some very thin walled elongated wood cells with transverse or slightly oblique walls. These elements are of very delicate structure, and disappear readily under chemical treatment in making pulp.

Wood cells form but a very insignificant part of pulp, due to their originally small proportion and to the breaking up of the primary cells into the minute fragments in the shape of the aforesaid rings and spirals. The large wood cells (vessels) are about 40 microns in diameter (micron = 0.001 millimeter), while the small ones are about 7 to 8 microns, or thereabout, in diameter, roughly about one-fifth the diameter of the large vessels.

Placed radially and on the outside of the wood, forming as it were the forehead of the fase, is a small group of very thin walled cells with very narrow lumina (ph. figure 24). This is the phloem, concerned chiefly in the movement of food materials. The cells are of two kinds, seive tubes, which have thickened end walls, and more slender cells lying alongside them, the companion cells. Like the wood cells, they are elongated elements, very slender and delicate, and usually disappear during pulping, and contribute not at all to the final product.

Surrounding the wood and phloem is a narrow layer of fibres **f**, figure 24), or rather fiber-like cells, with pitted walls and somewhat oblique (about 45 degrees) or transverse end walls. The fibers on the outside of the phloem (between it and the epidermis) are numerous enough to form a small bundle. This is the case also on the inside of the xylem (toward the center of the stem). The lateral walls when seen longitudinally



Figures 20-23. — ectors of transverse sections of the middle region of the lower internode of barley, oat, rye and wheat, resp. x 97.

[6] There is strictly speaking more than one series, but for the purpose of this description it is unnecessary to distinguish between them.

are irregular when they impinge on the surounding parenchyma. While contributing to the "fibers" of pulp, they constitute only a small proportion of shorter elements.

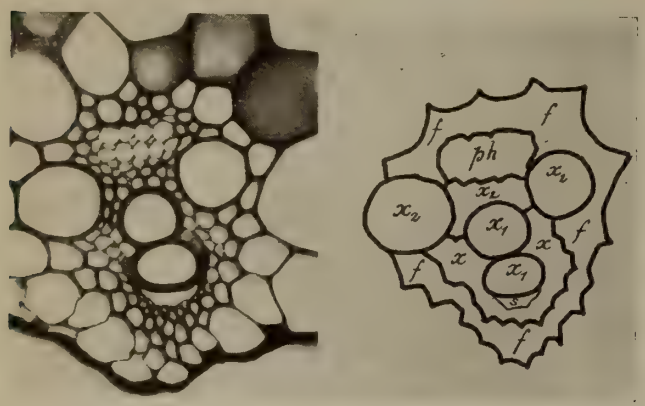


Figure 24.—Transverse section of a single bundle from the stem of wheat. x 232. f., fibers; ph., phloem; s., cavity formed by splitting of the tissues away from the primary wood trachea; x_1., primary wood vessels (tracheae); x_2., secondary wood vessels.

(To be continued.)

CANADIAN EXPORTS INCREASE.

Canadian pulp and paper exports for August reached a total value of $9,395,391, a decline of $8,863,336 as compared with August, 1920, but an increase of $2,628,835 over the preceding month of July. They were the highest for any month of the current fiscal year and appear to confirm the view that the tide has definitely turned in an upward direction. The shrinkage under last year's figures is more apparent in values than in volume as the following statement shows:

			August 1920.
Book paper	cwts.	5,994	$ 64,293
Newsprint		1,419,028	7,301,605
Other paper			1,380,919
			$8,746,817
			August 1921.
Book paper	cwts.	961	$ 11,349
Newsprint		1,306,429	6,015,305
Other paper			223,683
			$6,250,337

A comparison of pulp exports for the 2 months shows:

			August 1920.
Sulphate	cwts.	267,418	$1,284,365
Bleached Sulphite		191,690	1,598,001
Unbleached Sulphite		574,343	3,820,278
Groundwood		816,081	2,809,266
		1,849,532	$9,511,910
			August 1921.
Sulphate	cwts.	152,674	$ 587,664
Bleached Sulphite		187,945	834,445
Unbleached Sulphite		144,518	489,261
Groundwood		435,955	1,233,684
		921,092	$3,145,054

Countries of destination were: Paper, United Kingdom, $79,511; United States, $5,641,274; other countries, $529,552. Pulp: United Kindom, $879,354; United States, $1,909,491; other countries, $356,209. For the first 5 months of the current fiscal year, the comparative figures are:

	Paper	Pulp	Total
1921	$27,604,901	$12,121,739	$39,726,640
1920	35,170,271	35,582,503	70,752,774
1919	22,531,667	12,883,748	35,415,415

Pulpwood to the amount of 87,379 cords, valued at $1,178,038, was shipped to the United States during August, compared with 133,464 cords, valued at $1,695,038, in August, 1920. During the 5 months period the volume and value of pulpwood exported to the United States was as follows: 1921, 371,780 cords, valued at $4,882,365; 1920, 502,315 cords, valued at $5,756,464; 1919, 425,974 cords, valued at $4,205,118.

"I DUNNO."

"I Dunno," a new hand, came on one night. They put him next to me in the pulp room. I asked him a couple of questions about what he was supposed to do.

"I dunno," says he. He had the biggest grin I've ever seen. It must have been fourteen inches from tip to tip.

The next night I asked him how he was getting on.

"I dunno," says he.

I says to myself: "Well, it's all right for YOU not to know, but somebody's got to know, and I hope for the sake of that cheereo double-X grin that it's not the boss."

After a week of the grin and the "dunno" I, for just one buddy on that job, wished one or the other of them would disappear.

It did — I mean they both did.

I saw'em go.

And I heard the boss say: "If he'd said 'I DO KNOW' once, we could have kept him — just for the grin."

I got to thinking. And I wondered how many times in my life I'd said 'I DUNNO' when it might have been 'I DO KNOW.'

"I DUNNO" means: No money — No job — Failure — Disappointment — Unhappy families.

"I DO KNOW" means: Leadership — Money in the bank — Owning your home — Steady work in dull times — Happiness and Contentment.

— Copr. 1921 Babson Institute.

The best way **to know** about pulp and paper, is to add to your own experience the concentrated knowledge of the ablest practical men in North America, as presented in the Textbooks prepared by the Pulp and Paper Associations. There are five volumes; two are ready for delivery, the others are in preparation. It is wise to order now. Use this form. Remittance must be enclosed.

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Pulp and Paper Magazine of Canada,
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PULP AND PAPER NEWS

It seems probable, as has been previously indicated in these columns that the striking printers in Toronto, who belong to Local 91, International Typographical Union, will give its support to the Canadian Labor party, at the forthcoming general election. Indeed, these is some prospect of the Union's financing a daily newspaper, to support the Labor candidates. The strikers regard the situation which faces their Union as one which was created by the Canadian Manufacturers' Association. This last mentioned body is giving its support to the Meighen government, and the strikers, accordingly, declare that it is up to them to help to defeat the government. Enthusiastic supporters of the Labor party in the Typographical Union assert that Local 91 will give apponents to Labor candidates a hard row to hoe.

It is reported that several concerns have taken legal action against the Riordon Company in connection with the construction of the Kipawa Plant.

The Courtena, B.C. "Review" prints a report from Campbell River, B.C., to the effect that a prominent English firm intends to acquire water rights and build a pulp mill within a reasonably short time in the vicinity of Campbell River. Several Vancouver business men are said to be interested.

The rossing plant at Murray, St. Ann's, C.B. are closed down, although, if there is water enough in the river, a fall drive is expected. (This plant is almost invariably referred to by newspapers as a Pulp Mill. It is a cutting up and rossing plant installed by Canadian Ingersoll Rand. There is no pulp mill on the island of Cape Breton.—Ed.)

The Sorting Gap and Slasher Mill activities of the Belgian Industrial Company have closed down for the season.

Plants are to be erected in Vancouver and Victoria by the Canadian Producers' Corporation, which has been organized for the purpose of handling lumber and its by-products. The orders received by the Corporation will be distributed to local mills to fill, and shipment will be made from the Corporation's plants.

Mr. Edward Beck, in charge of publicity of the Canadian Pulp and Paper Association, last week addressed a letter to the press, supplementing a previous communication from him on the same subject, relative to the Australian tariff preference on British paper. As Mr. Beck indicates, the British government, in obtaining this preference, have practically destroyed the Canadian export trade to Canada — and it certainly does not transgress the proprieties of fair comment when contrasting their action in this regard with the honeyed words of Mr. Ben A. Morgan, the missionary in Canada of inter-Imperial trade. But after all, it is against the Canadian government that the paper manufacturers of Canada have their main cause of complaint. Mr. Beck's recent letter clearly demonstrates that the Dominion government received ample warning that this great Canadian industry was in danger of losing its Australian market. But it did not make any adequate effort to reach such a trade agreement with Australia as it would have sufficed to protect Canadian interests. The bill which will give legislative form to the resolution discriminatory, in favor of Great Britain, against Canadian paper imports, has passed the Australian House of Commons and next month, will be taken into consideration by the Australian Senate. It is true that when the bill was passing through to Australian House of Commons, the Canadian paper manufacturers took steps to acquaint that body with the effect which its passage would have on their export trade. But, inevitably, their intervention lacked the weight that would have attached to intervention from the Canadian government—for this reason, among others, that the necessary authority to negotiate such a trade agreement as would have safeguarded the interests of the Canadian export paper trade did not reside in them. For its policy of "laissez faire," the Canadian government merits little thanks at the bonds of Canadian paper manufacturers—and especially at this juncture when the need for every possible outlet for the products of Canadian paper mills is being increasingly felt by the industry at large.

The annual meeting of the United Typothetae of America (Toronto branch) was held last week. It reappointed the members of the Defence Committee which was organized to combat the strike. But it was announced that, beyond a casual reference to the strike, no discussion of the present trouble took place at the meeting.

At the invitation of the pastor of Perth Avenue Methodist Church, Toronto, Mr. James Simpson, the Socialist leader, who acts as a spokesman for the striking printers, stated the latter's case to the members of that church, last week. He asserted that the Typothetae has consistently lied in their advertisements in public press about the conditions of the present strike of members of the Typographical Union. " The members of the Typographical Union at present on strike," said Mr. Simpson, "are out because they believe the promise of the master-printers that the forty-four hour week would go into operation on the 1st of June 1921. The master-printers broke faith, and the strike is a result of that."

On the other hand, Mr. W. A. Sutherland, the secretary of the Toronto Typothetae, and the Rev. Dr. S. W. Fallis, steward of the Methodist Bookroom and chairman of the Defence Committee of the Toronto Typothetae, flatly deny this charge of broken faith. Said Dr. S. W. Fallis, last Saturday: "That is not true. We have stated again and again in the press that the only undertaking in the direction of forty-four hours for the 1st of June 1921 was made by a small section of the Typothetae." In substantiation of his statement, Dr. Fallis proceeded to quote the following from "The Living Church," of Milwaukee, a church paper which. he said had found itself involved in the same struggle as the Toronto Typothetae: "A group of closed shop employers, chiefly from New York and Chicago, meeting apart from the organization, and not representing the whole organization, agreed that they would establish the forty-four hour week in their respective shops in the spring of 1921. Those who thus agreed undoubtedly committed themselves to that policy, and there were enough of them to secure a fairly general

adoption of the shorter week, last spring in these two cities. Closed shops in New York and Chicago have, therefore, not become involved in the strike. But that the craft generally was not committed to that policy was made clear by a resolution of the Typothetae itself at a subsequent annual meeting. The shorter week was not acceptable to employers generally. These hold, with experts in social economies generally that forty-eight hours a week constitutes the standard working period that should be retained. Thus, scarcely any employer outside those two cities and not nearly all within them, was committed to the forty-four hour week." Dr. Fallis added that the allegation "that any such promise was made in 1919 by the negotiating committee of the Toronto Master Printers 'Association has been denied again and again in the form of a declaration to which is attached the signature of every member of that committee, all of whom have signified their willingness to make an affidavit if necessary."

Damage estimated at between $75,000 and $100,000 was caused by a fire which broke out on Wednesday of last week at Ste. Cecile, about nine miles from Lake Megantic. It is stated that the fire was evidently the deliberate work of incendiaries, for the flames are said to have broken out at four different places at almost the same time. Several thousand cords of cedar shingles, four hundred cords of pulpwood and several thousand feet of hardwood were destroyed, while a saw-mill and nine houses were badly damaged.

While pretty generally, in spite of the much lower wages being offered this year than last year, for work in the woods, there has been little difficulty in getting labor, on account of the prevalent unemployment, this has not been the invariable experience everywhere. For instance, work in the North Bay district recently offered for 350 bushmen, and it was found necessary to seek the help from Sudbury, as it was not forthcoming from North Bay.

There is an expectation that some of the larger newspapers in Ontario may reduce their price now that newsprint will cost them less. There is certainly no reason why they should not. They were quick enough to "jack up" the price as soon as they got an excuse for it. And two cents coupled with the increased price (as compared with that of a very little while ago, which these newspapers are charging the advertiser, has made any properly run newspaper, with a good circulation, a very paying proposition—particularly as the weaker sisters are, many of them, getting out of a game which, lacking adequate financial backing and (very often) horse sense as well, they should never have got into. Papers run properly are proving regular gold mines—and one does not have to go a hundred miles from Toronto to verify this. But few of them are worth two cents. And, anyway, a reduction in price would unquestionably make for an increase in consumption of newsprint.

Mr. A. L. Dawe, Secretary of the Canadian Pulp and Paper Association, spent a few days in New York last week.

Supt. R. Muir of the Brompton Kraft mill fractured his leg in a fall down stairs at the mill. Edmond Roi was injured by being hit by the coal unloading bucket.

Some time ago we printed a cartoon of Mr. J. A. Bothwell as a horseman. That was no joke; the Belgian and Clydesdale horses of the Brompton Pulp and Paper Co. won 26 prizes, including a championship, at the Sherbrooke and Quebec Exhibitions.

After being shut down for two weeks on account of repairs, the No. 1 paper machine of the Belgian Industrial Co. is humming again, No. 3 machine has also been down a week for the same reason.

QUARTER MILLION CORDS FOR SALE.

"We learn" says the St. John's, Nfd., Telegram, "that the quarter of a million dollars worth of pulp wood which was the cause of so much discussion during the last session of the Legislature, and which the Government announced as sold to a West Coast firm, is still lying on the banks, the purchasers evidently falling down on the deal. Only a small portion of this wood, which was cut last winter in relief account, has been sold, although the Government had good offers for it. It is said that our Commissioner at New York has for some time been trying to find a purchaser, but getting in the market too late to make a sale it seems now that the country will have to saddle a heavy loss."

Here is a chance for Mr. Bellew to pick up a couple of years requirements on that contract for Holland that he expected to cut in Labrador.

BRISTOL BOARDS AND PASTED COVERS.

A significant announcement made this week is the advice that the Cornwall plant of the Howard Smith Paper Mills has completed the installation of a new pasting machine, which will be in full operation this week. Not only will the output of the mill be somewhat increased, but what is more important, there will be available in Canada a line of Canadian made covers and Bristol boards of high grade and in sufficient variety for the high standard of catalogs, plates, etc., which advertisers and other users now demand. The recent completion of their sulphite mill will enable the company to manufacture this product economically and to command a supply of specially prepared pulp.

TEN PAPER POINTERS.

In 1920 there were 1,653 paper machines in operation in the United States. In 1921 there are 1,706, and in 1922 there will be at least 1,710 machines.

There are 818 paper and 322 pulp mills in the United States.

In 1920 the paper industry in the United States passed the billion dollar point in value of output.

Book paper leads the industry in value of output, with a product worth $220,000,000 in 1920, and Board and Wrapping had a close race for second place.

Additional pulp capacity is projected by twenty-three United States manufacturers and sixteen in Canada.

The tonnage of paper produced in 1920 was 7,334,614, with Board leading, the total being 2,313,449 tons News, Book and Wrapping following in order.

Motion pictures showing the manufacture of paper are being made available for distribution by the American Paper and Pulp Association, to educate the public to the importance of the industry.

Paper mills for the first six months of 1921 averaged 57 per cent of capacity.

A German paper machine tender receives 7 cents an hour, figuring the German mark as being worth 1.4 cents. Other employes receive about one tenth of the American wage.

The capacity of American paper mills in 1921-22 will show an increase of 9.6 per cent over 1920.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. **GARDENVALE, P. Que., October 6, 1921.** **No. 40**

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

Subscription to any address in Canada, United States and British Empire, $5.00 yearly. Other Countries Postage Extra. Single copies, 15 cents.

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Montreal				Victoria



This Big Plant Is Equipped With JENKINS VALVES

Above is pictured the Kipawa plant of the Riordon Pulp and Paper Co., and at the right is shown a Jenkins Extra Heavy Cast Steel Gate Valve—one of the many Jenkins Valves with which with this plant is equipped.

This valve has spindles, seat rings and wedge faces of Monel Metal rendering it admirably suited for superheated steam service.

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EDITORIAL

HEAVY TIMBER IN LABRADOR (?)

The editor has received an invitation to subscribe to an offering of $300,000 8% One Year Secured Notes, redeemable at par and interest. The security is stated to be an absolute assignment of a 99 year renewable crown lease of a timber and pulpwood area of 2,000 square miles. The invitation states that this property is situated in the most densely wooded part of Newfoundland—on the Hamilton River, and is not subject to local legislation on regards to future taxes, stumpage, restrictions etc., and that the annual carrying charge is definitely fixed at only $4,000 per year. The purpose of the issue is, ostensibly, "to pay off in full, certain charges, interests, etc.," pertaining to sale of this property to British interests. In the event of default of payment of the notes it is stated that the trustees will have reserved an amount, the interest of which will be sufficient to pay the rental on property so that the security is equivalent to a first mortgage, and a default would make the note holders, through the appointed trustee, owner of the property.

We note a statement to the effect that all the titles, etc., pertaining to this issue have been examined and passed by a firm in Montreal, one member of which has the same surname as a joint trustee of the fund and we note that the other trustee is the present lessee of the property.

The notice of the offering is perfectly plain but, in support of the contention that the timber and pulpwood lands which form the security are worth *millions of dollars,* the notice is accompanied by a "report on 2,000 square miles of Hamilton River property, situated in Newfoundland." We shall mention a few of the high spots in this report.

It is a copy of a report prepared for the Government of Newfoundland by a gentleman whose titles are represented by the initials J. P., D.S.I.C. and the report is dated *December,* 1912. Reference is made to a map showing the Grand River with its numerous tributaries and branches which drain the property and furnish the finest logging facilities.

The principal growth is estimated at 80% Spruce, 10% Fir, and the balance Juniper and Aspen.

The next two paragraphs we quote verbatim.

"The bulk of the timber follows the water ways where the stand is very large, averaging ten cords and upwards to the acre. Saw logs above the 10 inch measure will cut 4000 feet to the acre. The timber is exceptionally sound, straight, clean and free from under brush, having a diameter of from 10 inches to (2¼) (2½) feet and commonly reaching a height of from 50 to 75 feet. Three 16 feet logs from a single tree are in abundance.

About 25 per cent will make deals 10 to 12 inches in width and 40 per cent will make deals 7 to 9 inches in width and the balance may be sawn into scantling or cut into street paving blocks; slabs from the largest timber may be cut into lath; and exported to the American market, the Timber is strictly virgin and grows well up the hillside and can be easily drawn to the River. On some of the smaller rivers, I came across acres that will cut from 10,000 feet B.M. to the acre. The average diameter of Spruce trees 10 inches and up on the whole property is 16 to 17 inches."

The report states that at Grand Falls is a water power capable of developing 1,200,000 H.P. with the flow estimated at 50,000 cu. ft. per second. The time when measured is not mentioned. In addition there are several falls which might develop 15,000 H.P.

Mention is made of many sites suitable for the location of a mill and that the river is suitable for the delivery and storage of logs and that there is sufficient flow of water to drive *at any time* during the year. (Italics are ours). The shipping facilities of the Grand River are described as good.

A rather astonishing paragraph is that which says that the thermometer rarely registers 20 below zero, that logging is possible from October until the end of April, and that at no place will the log haul be greater than two miles. In this paragraph, we note for the first time the word *Labrador,* where it is incidently mentioned that the southern point of Labrador is in the same latitude as London, that summers are fine and warm, when the temperature averages about 80 degrees F.

The report states that any quantity of skilled labor may be obtained in Newfoundland from the axeman to the millman, and adds that hundreds go every spring to work for the steel and coal companies, at Sydney, C.B.

The following tables are so important and at the same time, to our mind, so ridiculous, as having any present value, that they are given in full.

Timber Limits.

The limits contain free and clear of waterways 2,000 square miles or 1,280,000 acres. Placing the pulpwood at 10 cords to the acre, a most conservative estimate, the limits would cut:

Saw Logs above the 10 inch Measure:		
Spruce	4,096,000,000	feet
Fir	512,000,000	"
Birch, Juniper and Aspen	512,000,000	"
Total quantity Feet B.M.	5,120,000,000	"
Pulpwood above the 4 inch measure	12,800,000	Cords

Cost of Lumber C. I. F. New York.

Cost of cutting, driving, repair to river per 1000 feet	$4.00
Sawing and piling	2.00
Loading from mills	.50
Royalty or Stumping to Newfoundland Government	.25
Freight, covering insurance	3.20
Duty in the United States Ports (Payne-Aldrich tariff)	1.00
Total C. I. F., New York	$10.95

(If delivered in English Ports, the cost would be $11.75).

Cost Ground Wood Pulp Per Ton C. I. F. New York.

Cost of cutting, driving, etc., at $2.40 per cord, allowing 1¼ cords of wood to one ton of pulp	$3.00
Rossing and grinding	3.50
Labour, including depreciation on machinery	1.23
Freight, covering insurance	2.20
Duty to United States Ports	1.67
Cost C. I. F. United States Ports per ton	$11.60

(If delivered in English Ports the cost would be $10.23).

Comparative Advantages.

	Canada	Newfoundland
Government Licenses	21 years	99 years with right to renew
Government Annual Rents	$7.00 per square mile	$2.00 per square mile
Government Duty	60c per cord pulp wood	Nothing
Restriction to cut Logs	Nothing under eight inches	No such restrictions
Estimated time for reforestation	40 years	40 years
Labour per month	$41.50	$18 to $25
Shipping	6 to 7 months per year.	6 to 7 months per year.

I value the timber as standing timber $3.00 per 1000 feet B. M."

Comment.

The above is an abstract of the report of a man who had been for two years in the Engineering Department and twenty years in the Department of Agriculture and Mines for the Colony of Newfoundland, with seven years experience surveying timber lands on the Labrador.

It is difficult to comment with proper restraint on a report of this kind and on the action of a financial agent in issuing it, nine years late, as a basis for collecting money on the security of the property supposed to be therein described. The first evidence of unreliability is the apparently studied care that has been taken to avoid the use of the word "Labrador". It is nowhere definitely stated that the property referred to is in Labrador. This being so, the comparison of the latitude of Hamilton Inlet with London is childish unless, perchance, the writer assumes that the men who read the report will have forgotten the interesting account in their geography of the warming influence of the Gulf Stream on the climate of England and the chilling effect of the Labrador Current on Newfoundland and Labrador. This region happens to come under the Government of the Island Colony although its geographic and climatic conditions are not exactly identical. Furthermore, to compare shipping facilities of Hamilton Inlet with St. Lawrence or other Canadian ports and give them both the same span of activity is incorrect. Ice has been found to give trouble in Labrador rivers in July. How is it possible, then, to ship goods for 7 months and drive logs the year round?

The statement with regard to timber supply appears to have been made with the optimistic abandon and disregard for accuracy which seems to have been typical of a number of reports made a decade or so ago. An acre which will cut 10,000 feet board measure will furnish approximately twenty cords and any considerable area which will furnish 10 cords to the acre is not to be found east of the Rocky Mountains. To say that an average diameter of Spruce among the larger trees is 16" or more, is very likely overstating the best growth on any pulpwood lands now operated by Canadian pulp and paper companies.

Perhaps it is a foolish waste of time, paper, and ink, for us to study and comment on such matters as this but the Pulp and Paper Magazine would not be doing the right thing to permit such a matter to pass unnoticed.

The figures given for groundwood pulp for instance, were low, probably 50% low, even for 1912, as respects the major items in the table.

The cost of cutting, driving, etc., is placed at $2.40 a cord. Apparently this costs a company absolutely nothing except the wages (without board) of the men. Labor is given at $18 to $25 per month. Nothing seems to have been added however, for the cost of supplies, food and shelter, certainly a man is not going to pay his board out of $18 a month. There are several other items in this table which will no doubt surprise Canadian manufacturers and may eventually start a stampede for Labrador. It may be that this table along with the other parts of the report refer to conditions more than nine years ago.

Perhaps we should not be cynical, but to be perfectly frank, we believe it unethical to mislead by giving incomplete information. No mention is made whatever of the possibility of changes in circumstances both as to labor costs, manufacturing costs, timber values, damage by insects, fire and storm, or changes in markets. There are a number of apparent exaggerations in the report that we have not definitely mentioned. We do not want to discourage legitimate exploitation, on any property or possibility, but this thing looks to us a bit fishy. It would mean that the bond holders are buying rights to what may now be a vast wilderness for all anybody knows from the information given.

We know definitely that some of the statements in this report cannot be substantiated at the present time, even if they were correct nine years ago. It is high time that offerings of such securities were based on accurate reports by disinterested parties and sufficiently recent to be of some slight value in making estimates.

SECOND INTERNATIONAL NUMBER.

The second annual International number of the Pulp and Paper Magazine is now in preparation. Copies will be sent to regular subscribers who send in their requests before Oct. 21. After that date and to non-subscribers, the price will be $1.00.

Impressions of a Canadian Tour

By PAUL JOUANNEAU, Papeteries de Vendôme,
Loiret Cher, France.

First of all I consider it my duty to state that I was delighted with the reception which I was accorded by the Canadian paper industry. I was allowed free access to all the mills and was able to obtain all the information which I desired from the mills which I visited, without being subjects to such restrictions as are imposed on visitors in certain European mills. Unfortunately I must admit that Canadian mills are easier of access than certain French paper mills, which is one of the reasons which induced me to continue my study of paper making abroad rather than in my own country. I was greatly surprised to see the co-operation which exists between most of the large Canadian mills. These mills keep continually in touch with one another, exchanging new discoveries as well as improvements effected in the equipment, even going so far as to exchange costs. By means of frequent technical meetings, their technical men have a chance to discuss all sorts of problems which make for a reduction in costs, increase in output, and improvements in the quality of the paper. Owing to this close co-operation, of which the Canadian Pulp and Paper Association is the moving spirit, the Canadian paper industry has grown in a hitherto unheard-of manner, developing its equipment to the utmost, and succeeding in making a very good grade of paper at stupendous speeds and relatively low costs. It is very regrettable that in France we lack this spirit of *technical* association, without which an industry cannot develop to the best advantage. We have merely a few small commercial associations, known as "syndicates", the main function of which is to keep prices uniform, but which exert no influence on the industrial processes themselves.

I naturally wished to start my duties in this country with the foundation of the paper industry, namely, the manufacture of chemical and mechanical pulps. For this reason, and also to begin my investigations at one end of the country, I went to Chandler, Que., (St. Lawrence Pulp and Lumber Co.) where, for a month and a half, I was able to study the manufacture of sulphite as it is carried out in most Canadian mills. I saw there that the cooking of the pulp is no longer left to the mere skill of the cook, but that it is being conducted more and more by strictly scientific methods, such as laboratory tests and analyses of the pulps. I have even come across another piece of equipment *, after I had left Chandler, which eliminates all intervention by the cook during the cooking process. This is controlled automatically from start to finish, so that when the cook reaches the end of the standard curve he merely has to blow his digester. In France wood is so scarce that chemical pulp mills are few and far between. As I never had the chance to study this aspect of the industry in my home country, I am not in position to compare the methods we use with those in use in the Canadian mills; but I am under the impression they are about the same.

As to mechanical pulp, I visited the magnificent mill of the Chicoutimi Pulp Co. The quality of the pulp turned out appeared to me to be higher than that of the groundwood which we import from Scandinavia: it is white, strong, and exceptionally clean. I was informed as to the "Hall process", and I am of the opinion that the manufacturers who wish to reduce the proportion of sulphite in news print would be well advised to look more closely into this process. I was also much interested in the new grinders built by the Chicoutimi Pulp Co. It is easy to see that down to the smallest details they are the result of a long experience in the manufacture of groundwood. One point that surprised me somewhat is the fact that second grade pulps are not refined in most of the mills which I visited. But as this grade of pulp can doubtless be put to some other use, I understand quite readily that it is useless to waste power in refining it. The few mills which do refine it use conical, knife refiners, while in France kollergangs are mostly used, and I think the latter are better as they are easier on the fibers. I have not much to say about magazine grinders, which I saw in operation in France some years ago. They are gluttons for work, and have a phenomenal output; but the quality of the product necessarily suffers, for it stands to reason that the grinderman cannot give such a monster the same attention that he can give to a smaller stone.

Let us now come to paper making itself. When I first entered the machine room of a large Canadian paper mill I was rather bewildered at the prodigious speed with which the paper was wound off at the end of the machine. The greatest speeds which I had seen in France were left far behind. My first thought was: "Canadians *turn out* paper, they are not *paper makers.*" My idea of the paper maker was the workman of olden days, who handled and nursed his stock in the beaters, watching over it continually, even when it was on the paper machine. In a word, I thought that paper made at such speeds could be of but indifferent quality. I was therefore all the more surprised to find out that the paper that was being reeled so fast was, to say the least, equal to European news print. Whether it be made in France or in Canada, news print is never a thing of beauty; but you Canadians have the advantage of producing enormous quantities of it on a single machine. This first mill which I saw was that of Price Brothers and Co., at Kenogami. I there admired the five splendid Walmsley machines, each of them the exact counterpart of its neighbor and running at 700 feet a minute, a speed which is as yet unknown on the other side of the Atlantic. But this speed has been considerably bettered, and it is far behind the speed of 1,000 feet a minute which has been attained by some more recent machines. Here I must say I experienced a

* Allen automatic control for pulp digesters.

slight disappointment, both in Canada and the United States, for, when I saw them, the famous machines which had run or were to run at 1,000 feet a minute, were only running at 800 feet. This was due to various reasons, such as lack of sufficient orders, the machines had not been properly tuned up, excessive power consumption, etc. I think that these high speed machines have not yet been sufficiently perfected, that they have caused a certain amount of disappointment, and that the very wide machines which turn out the same amount of paper per 24 hours have given less trouble and are giving entire satisfaction. But, nevertheless, I would have liked to see with my own eyes a machine running at this phenomenal speed of 1000 feet a minute, before leaving the New World. (Running at 1000′ regularly. —Ed.)

With regard to the paper machines, I must admit I was rather taken aback by the formidable slope given to the Fourdrinier wire. But evidently the stock must be given a speed in proportion to that of the wire, I have learned since then, however, that machine builders are beginning to do away with this slope in new machines. At the present time, a back slope (about 2 inches between the breast and couch rolls) seems to be preferred, and the required speed of the stock is obtained by increasing the head of stock behind the slice, which may be as high as about 50 inches. The merits of this system are easy to see. The chief one is the ease with which the machine tender can regulate his sheet to suit the speed of his machine by increasing or decreasing the head of the stock back of the slice. I saw one such machine (Bagley and Sewall) at the Ontario Paper Co.'s mill at Thorold. In France there are several machines equipped with suspended Fourdriniers, allowing of a quick regulation of the slope of the table according to the paper which is to be turned out.

The enquiry which I conducted in connection with the use of suction rolls gave me a very favorable impression of these rolls. They are in use in a few French mills; but the use of a suction roll for the bottom roll of the first press was entirely new to me. I am convinced that this arrangement presents great advantages, the chief of which is certainly a reduction in the number of breaks, which occur most often at the couch roll and at the first press. These rolls also effect a considerable reduction in the cost of clothing, which largely offsets the increased power consumption. All mills will certainly be equipped with these rolls in the near future, with the possible exception of those mills which make colored papers exclusively.

Rubber washing rolls on the jackets are much used in France instead of the wooden doctors. I was somewhat surprised at not finding any of these rolls, which seem to be completely unknown to Canadian and American paper makers. I think they possess certain advantages over wooden doctors which were tried out in our mills but did not give satisfactory results.

I had always been puzzled to know where the Canadian mills could find the acrobats required to handle the paper on their high speed machines. The problem has been solved by the use of automatic paper carriers: this improvement was entirely new to me, and I had the pleasure of admiring with what perfection it does the work for which it was designed.

I was greatly interested in the fascinating problem of electric drives for paper machines. In my opinion the sectional drive, such as the ones which I saw at the Laurentide Co., the Ontario Paper Co., the Interlake Tissue Mills Co., and several mills in the United States, is certainly the drive of the future, especially for high speed machines. It is evident that in spite of the high initial cost it soon pays for itself by the reduction in the power consumption, in lubrication, in cost of upkeep, in belting, etc. At the present time there are three competing systems, the Harland drive, the Westinghouse drive, and the General Electric drive. I have studied two of them very carefully, and it is extremely difficult to decide in favor of one rather than the other. It is only through extensive experience that judgment will be passed on these new inventions; but it is certain that both these systems, which are entirely different from each other, are quite curious. The starting point of these electric drives is what is known in France as the "Léonard group", which we use extensively for driving paper machines from one large motor.

The Bird screens and the Nash vacuum pumps also attracted my attention. I consider them perfect, in spite of their high cost.

The pulp preparation department was a revelation. Where are the beaters, the pulpers, the kollergangs? All this is done away with! Chests, huge chests, containing the pulp from the digesters or from the grinders, and a cabin, similar to a railway switchman's cabin, replace all the apparatus formerly used. A single man who manipulates a few levers does the work formerly done by twenty men. These levers operate, either pneumatically or hydraulically, various valves which control the flow of the pulps into the mixing chests. Pumps then send the mixed pulps to the paper machines. How wonderfully simple! Certain mills have even done away with the Jordans. Of course, controllers and regulators are required in various places, but everything is automatic, and nothing is touched by hand. The Belgian Industrial Co., at Shawinigan Falls, has recently installed a first class equipment of this kind. A few French mills are beginning to adopt this system; but naturally it can only be the ones which make their own chemical and mechanical pulps, so that they cannot be numerous.

At the Belgian Industrial Co. I had a chance to get a close insight into, and to admire the wonderful organisation of the statistics departments of the large Canadian mills. The records, reports, and archives are drawn up and kept in such a simple manner that a single glance will show the operations of any department or of the whole mill. Comparisons can be drawn for several successive years, inventories can be drawn up, or expenses determined, etc., in a very short time without having to go through endless registers.

The innumerable pieces of control apparatus and of automatic recorders to be found everywhere and for every purpose, even to the break recorders on the paper machines, also excited my curiosity. I shall not dwell on all the practical devices which I saw for the handling of paper and other materials: conveyors of all descriptions, electric trucks, cranes, compressed air hoists, weighing machines, etc., everything was designed for a special purpose and fulfilled the function for which it was meant, effecting appreciable savings in the cost of labor. There are some cases, however, where this has perhaps been pushed a little too far; and, in an attempt to cut down the cost of labor, the upkeep was increased to such a point that it exceeded the former cost of labor. Moderation is good in all things, even in the use of automatic devices.

A great factor in the large production of Canadian news print is the standardisation of this grade of paper. All the mills turn out paper of the same weight, color, width, and composition, or nearly so. Less color to buy and to handle, no troublesome changes in size and speed to be made, simple devices for the automatic regulation of the stock consistency and of the drying, simplification of the work of the machine tenders in controlling the quality of the paper, such are a few of the numerous

advantages of this method of working. Moreover the machines are easily classified into two, two and a half, and three roll machines, which greatly simplifies the choice of machines and also the work of the machine builder who can manufacture parts on a larger scale. When shall we in France standardise our news print? Of course it is impossible to change the size of all the paper machines all at once, but the standardisation of weight and color alone would be a great help. At the present time each one of our newspapers has its own size, weight, and color, a fact which is not conducive to large output. It is to be hoped that some day our publishers will follow the lead of their colleagues on this side of the Atlantic, thereby relieving the French news print manufacturers of many of their troubles and making for a more uniform, and consequently better, paper.

The belief is quite current in France that Canada has devoted the whole of its energy to the production of news print and has neglected the finer grades of paper. I have seen for myself that we are mistaken in this respect, and that Canada produces fine papers of very high quality. I had occasion to visit the two mills of the Rolland Paper Co., at St. Jérôme and at Ste. Adèle, and I there admired the qualities of the Linen Bond turned out at these mills, which will stand favorable comparison with any pure rag paper turned out by the oldest French paper mills.

In closing I must mention how interesting I found the kraft mills which I had a chance to visit. This kind of pulp is almost unknown in France, always for the reason that France is not a wood producing country. It was during my visit at the mill of the Wausau Sulphate Fiber Co., Mosinee, Wis., that I realised the advantages of this process and the superiority of the paper made in this manner as a wrapping paper.

Of course esparto pulp is unknown in Canada; and it is one of the advantages which France possesses to be able to utilize this material in the manufacture of the better grades of print paper. It is undeniable that print papers made from wood pulp are not comparable with those made from esparto.

In the United States I was fortunate enough to visit many Wisconsin mills, each of which presented some new features of interest. I am finishing my tour by going through the mills in the neighborhood of Watertown, whence I shall go to the Holyoke district. One could doubtless spend his whole life visiting paper mills, and in each one there would be some new and interesting feature to observe. But the best of things must come to an end. In a few days I shall sail for France, perfectly satisfied with the mass of data which I have collected, my head crammed with new and practical ideas, and taking with me the very best impression of the warm welcome which I found everywhere in Canada and the United States.

At the dance held at Iroquois Falls during the visit of the Directors last month, says the Broke Hustler, "one of the features of the dance was the presence of Mrs. Anson the mother of the President. The young people took it as a great compliment that the lady of four score had sufficient interest to go, and smile her pleasure as the youngsters of a mere score of years circled past her. Many were the eyes turned towards her with real respect and affection showing plainly the pleasure it gave the dancers to have her with them."

Golf has taken hold of the folks at the Abitibi mill and a tournament is in progress.

Why Cost Keeping is Necessary

Extract from articles appearing in the "American Magazine", by Edward N. Hurley, late Chairman of the Federal Trade Commission, prepared for the Cost Association of the Paper Industry by J. T. Burke, Secretary.

Do you know that out of 250,000 business corporations that reported to the Federal Trade Commission, 100,000 showed no net income at all? Only 60,000 earned over $5,000 a year, and 90,000 earned less than $5,000 a year. These figures are founded on the reports of the owners of the businesses themselves and mean that nineteen out of every twenty-five corporations in business either earn nothing at all, or earn only the fair sized salary of one good man.

One half of all the people in business in this country today do not know whether they are making money or not. They may think they know. They may tell you they are making money, or they may tell you they are falling behind. But in either case they will be only guessing. They cannot know accurately, for they have no cost books and thus no way of determining costs. They frankly work by rule of thumb.

Forty per cent of business men go a little further and have some rough way of estimating costs. They are just as apt to be wrong as right, and are perhaps worse off than the first group because a bad system is worse than none at all. The remaining ten per cent actually know what it costs them to do business.

Most manufacturers do have bookkeeping systems; but many of them simply keep the actual cost of material and labor used; they seldom account for materials wasted or lost in the process of manufacture, or for bad debts. The expenses over and above labor and materials are known as "overhead" and are highly important. This "overhead" expense often equals the cost of labor and material.

Business men sometimes make a careful study of what an article costs during a certain period, and, then taking the resulting figures as a standard, use them for years without checking up. I know one firm that thought it cost a dollar a day, over and above wages, to send out a mechanic and helper on jobbing work. For a long time, they made that charge. An accountant, analyzing the costs, discovered that these two men, **exclusive** of wages or any profit, actually cost in overhead expenses an average of $2.16 a day!

A manufacturer of shirts established by test a cost, and used the same figure for nearly two years. When he checked up by an inventory he found he had lost $20,000 because the standard cost had not taken into account waste of materials. A firm doing a business of around $100,000 a year kept only the cost of labor and materials. They put in a new system which disclosed that twenty-five per cent of their business had been done at a loss, that another twenty-five per cent, purely by luck, was done at a profit sufficient to cover that loss, and that their net profit, came out of the remaining $50,000 worth of business. A business of half the size, well managed, would have been more profitable.

No man has a right to be in business **unless he knows his costs.** Installing a system, or keeping up the books, is not an expense. It is insurance money. The price of an adequate cost system is paid over and over again every month.

No man has a right to ask for credit unless he knows what he his doing; and he cannot know this unless he

not only knows costs, but is able to relate them to income. Before attempting to get expenses in shape it is necessary to find out not only what your expense **are**, but also what they **should be.**

There is always the question whether the dollar one is asked to spend should be spent—whether it will give a return or whether it is waste. It is not the great sums that matter, one catches these at once. It is the little sums that are paid out in the course of the day's work that frequently spell the difference between profit and loss, between success and failure. The larger the business, the larger the opportunities for waste, although the **proportion** is not as large in big as in little business.

This is the method that we finally worked out and which I think will apply equally well to any kind of business, irrespective of size. It may also be applied to one's private affairs:

First, we took the year's business and planned what the next year's business ought to be; that is, set a definite task. The figure was not the highest possible, but a good conservative estimate, made up by going over each territory and finding the amount that could reasonably be sold. Anyone can arrive at a similar figure in his own affairs; the corner store can work out from the books how much has been sold in the past, and can then calculate a quota for the next twelve months. The amount to be fixed should not be limited only by hope; it should be limited by experience, and then regarded as a minimum and not a maximum.

That figure represents the gross income. We then deducted from that the profit that we calculated to make. That profit will depend upon the nature and risks of the business. It is practically impossible for other than very large concerns selling enormous amounts of goods to work on less than fifteen per cent profit on gross sales; the ordinary man will have to allow at least twenty per cent. (Remember, I am speaking of sales — not invested capital). First calculating the profit seems to be putting the cart before the horse, but unless this profit is first reckoned, so that a minimum figure of expense is had, one cannot know whether the spending is from what was calculated as expense or from what was going to be the profit margin.

Say the profit is to be twenty per cent and the whole sum of the business is to be $100,000. Then we know that we cannot spend more than $80,000 without cutting into the planned profit.

Next, we go back over our expenses and find out how much we were spending in the past and, separating all the expenses, get the absolute limits that must not be crossed if we are to carry out our plans. We shall have to pare down a lot of items in order to get within the limit. We shall begin to find out what we can afford, and the experience is very illuminating. If expenses have not been closely watched, no end of uselessly spent money will be uncovered. Any man going back over his last year's accounts can pick out items which are not supported by reason. The discovery may be made (and probably will be) that the business cannot be run on the arbitrary basis of profit. That will be the first impression. A further study may develop that furthur cuts must be made. or that a larger volume of business will have to be done in order to keep within the expense minimum. Or, again, a lower profit may have to be fixed. But do not imagine that you can do business on five or ten per cent. The big-volume, small-profit way of doing business allows no margin for doing **less** than the calculated volume. The thing is to plan what you **can** do, and not what you **might** do.

We know that if we do the full amount of business, and do not spend beyond the figures that we have set, we will make the full profit.

We have limit figures of what we can spend in each division of the business and how much we must take in to justify the amount. We know that if we spend what we calculate, but do only seventy-five per cent of the planned business, we are neither losing nor making money. We can thus give to ourselves a "passingmark" of 75; if we do ninety per cent of the amount of business estimated as reasonable, we know that we are doing fairly well, while if we score one hundred per cent we have done all that we started out to do. Because one cannot to make perfect scores all the while is the reason that it is dangerous to try to do business on too narrow a margin of profit.

On the other hand, if we exceed our expense budgets in one item, unless we can cover that overdraft in another item we know that we are cutting into profit. If we keep up the expenses, and do only fifty per cent of the business, we know that we are running at a loss, and can take immediate steps to boost the business, or to close it out. Every business now and again will run at a loss; but the proprietor ought to know his losses as they occur, and decide how long his surplus will permit the loss to continue. If it appears that the losses are due to temporary conditions, then the business lives "on its hump" until that condition changes; but if the condition is not temporary, then the serious matter of winding up must be considered. There is no point in staying in business at a continued loss.

WASTE PAPER STOCK SCARCE.

Increased demand and an upward trend in prices have marked the wrapping paper and board market the past week according to reports reaching the Canadian Pulp & Paper Association. The market for these commodities which has been more or less stationary for some months has become suddenly active. Paper stock from which boards are made and which was recently selling at so low a price that collectors refused to make their customary collections is now quoted at from $16 to $18 a ton and in brisk demand, both locally and for export. Canadian collectors are shipping part of their accumulations to the States and profiting by the increased price and the exchange premium. This is making a shortage of paper waste in Canada and indicates a higher price for boards. The improved tone in the market for these grades of paper is said to reflect the general tendency.

WILLIAM WHYTE WITH WALMSLEYS.

William (Billy) White has been appointed Canadian Representative for "Walmsleys" of England builders of Paper Machines, Steam Engines, Roll Grinders, Super Calenders, Stone Press Rolls, etc. He is leaving for England, Norway and Sweden this week in connection with the export business of "Ayers Felts" and "Niagara" Wires.

Think of good, useful and beautiful things, thereby toning up your mind to a high level, and improve every opportunity to uplift yourself.

The Structure of Cereal Straws

By FRANCIS E. LLOYD, F.R.S.C. McGill University.

(Continued from last issue)

Internal Structure of the Leaf Sheath.

The leaf is composed of elements which are quite similar to those above described for the stem, but arranged somewhat differently, due to the fact that the leaf is a flattened organ, the upper surface (which lies against the stem) being smooth, and the lower ribbed. In a transverse section it is seen to be (figure 25) segmented into similar areas of loose parenchyma which behaves quite as does the pith in the stem, breaking down early to leave cavities. Each partition is composed of a vascular bundle, having bundle of fibers (mechanical tissue) between it and the lower (outer) epidermis, and a group or bundle of larger, much elongated and fiber-like cells between it and the upper (inner) epidermis. The parenchyma which fills the ribs just below the lower (outer) epidermis is composed of smaller, chlorophyll bearing cells, through which a small bundle and a group of fibers run, parallel to the larger bundles just noticed. The amount of fibrous material is not inconsiderable, forming approximately one-fourth to one-third of the total amount of fiber of an equal length of stem. A peculiar anatomical feature of the leaf-sheath is the occurence of a



Figure 25. — Portion of a transverse section of the leaf sheath of wheat. Note the wide (1, 1) thin walled cells just above the bundles. u. epid., upper (inner) epidermis. x 130.

very long, thin walled tubular cells, (l, figure 25), forming a small group of fibers between the large bundles and the upper (inner) epidermis. They can hardly be classed as fibers—or at any rate they cannot be compared with fibers in point of strength, since the walls are thin and the lumen large, measuring 60 microns, more or less. The end walls are transverse, slightly oblique, or forked. They are relatively few in number, but can usually be found in pulp or straw paper.

False Nodes.—The above described structure fails almost entirely at the base of the leaf-sheath, where the motile organ or false node occurs. There is an entire absence of specialized chlorenchyma, and the parenchyma is thick walled. The walls, however, in common with those of the bundles of fibers, which form a very conspicuous feature in a transverse section (figure 26) are soft and yielding during the growing period. The bundles in question accompany the fibro-vascular bundles, and the component cells are fiber-like, with highly elastic walls, seen as darker groups of cells in figure 26.

Chemical Characters of the Tissues.

When the cell-walls are first formed, they are composed of cellulose, with a layer (the primary membrane) of pectose between the adjacent walls. As development proceeds, additional substances (lignin-bodies) the chief of which passes under the term lignin are added to the walls.

Stem.—In the mature straw, all the cell-walls become strongly lignified with the exception only of the phloem, the thin-walled xylem (wood) lying on either side of the primary wood, the collapsed pith cells, and the chlorenchyma. The lignified tissues therefore are the epidermis,[7] all the fibers, all the wood vessels, (tracheids) and the parenchyma (save the inner pith cells and chlorenchyma) (figure 4). On account of the completeness of lignification the cellulose of straws (grain straws) are regarded chemically as lignocelluloses.

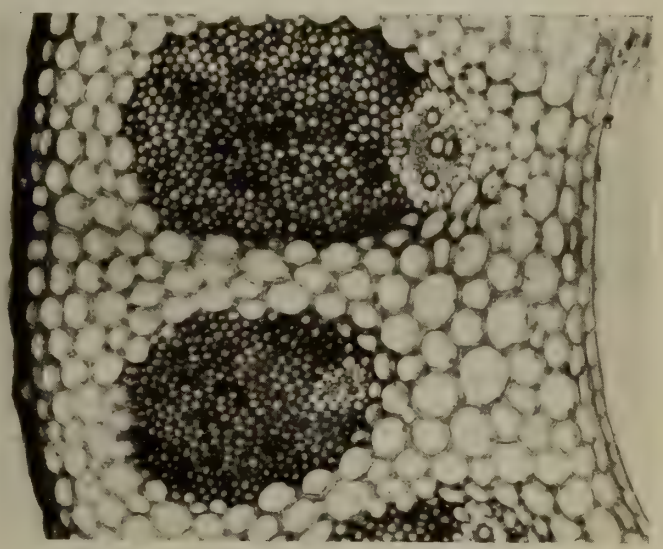


Figure 26. — Sector of a transverse section of a false node (leaf base) of wheat. x 105.

Leaf Sheath.—In the basal region the fibers between the bundles and the lower epidermis are wholly lignified. Of the long cells (l,l, figure 25) some, but not all, are lignified, those namely which lie near the middle vertical plane of the bundle. The true fibers occur, as they do next the upper epidermis in the left hand (the larger) bundle in figures 25, these are lignified. The lower (outer) epidermis is weakly lignified only, the inner not at all. The fiber and xylem (except the soft xylem) are also lignified. The parenchyma is not.

In the upper part of the leaf sheath only the fibers between the bundles and the outer epidermis, are lignified, as also the fibers and xylem vessels of the bundles. The thin papery leaf margin is unlignified for some distance from the edge, probably as a result of early dessiccation.

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[7] The lignin reaction proceeds very slowly in the outermost fibers and in the epidermal cells. This seems to be due to other substances possibly of the same nature as that which renders the cuticle waxy. A light yellow color is noticeable in these tissues.

In the false node there is no lignification at all, excepting only the xylem (wood) vessels.

The epidermis is clothed by a very delicate membrane which extends over the whole surface of the plant, the **cuticle.** This membrane is impregnated with a wax-like substance which renders it very hard and resistant, and gives it a highly glossy finish characteristic of straw. It repels even hot water after considerable boiling. There is some evidence also that the inner cells of the parenchyma and the associated cells are more or less impregnated with wax-like materials, since their primary walls are very resistant to concentrated sulphuric acid even after twenty-four hours treatment. This may be due simply to a high degree of lignification however.

There is furthermore a considerable degree of silicification of both cuticle and more of less of the tissue beneath. The presence of silica gives to the straw a corresponding degree of hardness and smooth finish. The amount of silica is sufficient in many cases to preserve the form of the cells even after the complete extraction of the cellulose and other materials by suitable reagents. An analysis of four samples of straw for silica gave the following percentages of the total dry matter.

Barley	2.07	Rye	2.18
	1.78		2.14
Oats	3.46	Wheat	2.30
	3.46		2.44

It is the amount of silica in the superficial tissues which renders the surface so very hard and resistant. It is well known that the same result is seen in the surface tissues especially of bamboo, rattan, and the like.[8]

Zacaton (Elicampes macroura) according to Brand and Murrill (1915) contains silica to the amount of 6.5 to 7.5 on the total straw. This is "very high."

In the preparation of paper pulp the pectose is altered, setting the cells free from each other, and the cells are more or less delignified. The delignification is carried on much further in bleached pulp than in the unbleached pulps. Papers subjected in manufacture to a 20 per cent and to a 15 per cent lime cook, and a "Kraft" paper all showed pronounced lignin reactions with the Klason and with the Cross and Bevan methods, while bleached papers from wheat straw subjected to a 6 and a 10 hour soda cook, and from oat, gave only very slight lignin reactions. An unbleached oat gave a distinctly stronger lignin reaction.

[8] The following figures are afforded by C. Wehmer (1911):

	Total ash.	of which silica constitutes
Barley	5-7 %	50-60 parts
Oat		50-66 "
Rye	5-10	60-70 "
Wheat	3-5	50-60 "

These figures are much higher than the previous given, but of course no adequate comparison may be instituted without due regard to place effect and other possible conditions.

(To be continued.)

The Iroquois Falls Baseball Club has won the Hamilton B. Mills cup twice in succession in the Northern Ontario Baseball Association, and now has permanent possession of the trophy.

U.S. PAPER INDUSTRY CONVALESCENT.

Federal Trade Commission statistics covering the American paper industry for August indicate a considerable improvement in the relative position at the end of the month compared with its beginning. Production of all grades of paper by the mills covered in the report totalled 442,519 tons while shipments amounted to 448,054 tons, shipments exceeding production by 6,535. Stocks on hand at mills amounted to 274,009 tons at the end of the month compared with 279,544 tons at the beginning, a reduction of 5,535 tons. Every kind of paper showed a decrease in stocks on hand except newsprint, of which stocks had increased by 1,609 tons. Book paper stocks decreased 2,409 tons, paper board 1,444; boxboard 2,257; wrapping 1,101; bag 309; fine paper 1,482; tissue 634; hanging 667; felts 1,481; miscellaneous, 1,153. Newsprint stocks equalled six days' average output of all mills; book paper, 11 days'; paper board, 9 days'; wrapping paper 26 days'; bag paper, 5 days'; fine paper, 32 days'; tissue paper, 14 days'; hanging paper, 33 days'; felt and building paper, 9 days'; and miscellaneous 22 days' average output.

Shipments of pulp of all kinds for the month totalled 39,544 tons, which added to 186,362 tons used by the producing mills made a total of 225,906 tons used or shipped against a total production of 195,176 tons, an excess of used and shipped over production of 30,530 tons. Stocks on hand showed a decrease of 30,730 during the month. Groundwood pulp stocks at the end of the month equalled 35 days' average output of reporting mills; News sulphite, 9 days'; bleached sulphite, 2 days'; mitscherlich sulphite, 9 days'; sulphate, 15 days'; soda pulp, 7 days', and mill stocks of other than wood pulp, 4 days' average output. The total mill stocks of all grades on hand at the close of the month equalled 20 days' average output.

The inference to be drawn from these figures is that increased activity in all pulp and paper mills is imminent. With shipments exceeding production in practically all lines and stocks on hand showing serious depletion it is inevitable that an exhausted market must shortly result in increased demand and a general betterment of the industry's situation. There are indications that the increased demand is already making itself manifest.

T. & N. O. GOING NORTH.

T. and N. O. Railway extension work will be commenced this winter upon a seventy mile right of way northward out of Cochrane to Smoky Falls. The estimated cost of the extension is $3,500,000. This decision of the Government to go ahead with clearance and construction was announced yesterday by Premier Drury upon his return to Toronto, following a conference with members of the T. and N. O. Commission in northern Ontario.

Besides tapping a country of wonderful agricultural, lumbering and mineral possibilities, the new line will pass the big power development on the Frederick House River.

While the extension has long been urgently pressed by north countrymen as necessary to the development of northern Ontario, the Premier said that the early commencement was partially with a view to relieving unemployment conditions.

The plant of W. H. White, tank maker, Montreal was destroyed by fire last Monday night.

PROTECTING WOOD PILES WITH SPRINKLERS.

Through the kindness of Mr. A. L. Dawe, we have been fortunate in obtaining the accompanying photographs showing the eficient manner in which the giant wood pile of the Spanish River Pulp and Paper Mills at the Soo is protected from fire. It has been shown that a fire once started in such a pile cannot be extinguished with ordinary equipment and water supply,



How the Pile Looks from the Canal.

and even under the most favorable conditions for fighting, the fire must be discovered and fought within the first fifteen minutes of the blaze.

Figure 1 shows the wood pile as it appears from the canal.

Figure 2 shows a close view of an individual nozzle.

Figure 3 shows the very effective manner in which



Close-up of a Spray Nozzle.

the water is distributed over the whole surface of the pile and is proof of the efficiency of this system as insurance against a disastrous fire. It will not be difficult to understand why, during the past summer, the mist enveloping the wood pile so resembled smoke that



A Perpetual Fog Envelopes the Wood.

the company was repeatedly advised by passing steamers that the log pile was on fire.

After considerable investigation of nozzles for the purpose, it was decided to use the No. 3B and 4D sizes made by the Spray Engine Company of Boston. The pressure of 108 pounds per square inch is maintained on the lines. The method of carrying feeders with short stand pipes to the nozzles is clearly shown in the illustrations.

The introduction of this system of protection, and in fact the arousing of the industry in general to the wisdom of preventing fires as the best insurance, is largely due to the educational efforts along this line by Mr. F. J. Hoxie of the Fire Underwriters' Association, Boston. Several excellent articles by Mr. Hoxie have appeared during the last couple of years in the Pulp and Paper Magazine.

"HARD TIMES" SOFTENED BY PUBLIC WORKS.

There is nothing novel in the suggestion that in "hard times" there should be liberal expenditures for for public works. All economists agree as to the wisdom of such action But it has not been sufficiently emphasized that the only class of employer capable of "saying it with jobs" is the public; for the public, unlike the average individual or stock company, is able to make an investment without securing an immediate return upn it.

That investments in most public works are ultimately profitable to the public there is little doubt. That public improvements have been subnormal for six years is beyond question. The immediate beginning of enough public improvements to catch up with the six-year deficiency will do more, I believe, to start a general business revival than can be accomplished in any other way.

It should be borne in mind that all the money spent for public improvements during 1916 to 1920 should be divided by two, in order to make comparisons with prewar expenditures, for construction costs were approximately doubled throughout that period. Common labor is now only 50 per cent, and skilled construction labor is about 60 per cent above the prewar level. Per capita money is 60 per cent above the prewar level and will probably not vary much from its new level for several years. During the past 80 years—as far back as reliable data exists—the wage level in America has moved in harmony with the per capita money. Hence it is safe to assume that construction wages are now, in most cities, and in 90 days will be in nearly every city, at a relatively permanent level.

Hence the public has little or nothing to gain by waiting for the lower construction wages, whereas it has much to gain by starting a business revival such as will follow a big era of construction.

Halbert P. Gillette,
Editor, ENGINEERING AND CONTRACTING.

Mr. R. S. Kellogg, Secretary of the Newsprint Service Bureau, was a visitor in Montreal, Toronto and Thorold, this week. While in Canada, Mr. Kellogg, who is also secretary of the International Committee on Textbooks, conferred with the Education committee of the Canadian Pulp and Paper Association regarding plans for educational work in the industry.

It may be no disgrace to be defeated. It is a disgrace to stay defeated.

Technical Section

REVIEW OF RECENT LITERATURE.

A-1; C-5. Molds and Wood Destroyers. Paper, xxvii, (March 2, 1921). In the early stages of their growth molds and wood destroying fungi sometimes have a similar appearance and there is no simple means by which the lumberman and wood users can separate them at sight. The characteristic feature of mold growth on wood is the fact that the minute threads which enter the wood do not bore into the wood fibers or dissolve them away; but pass through the spaces between the fibers or enter them through the natural openings, or pits, which are found in the walls of certain cells. The wood destroying fungi are able to send their threads right through the wood fibers, breaking down the cell walls and utilizing portions of this decomposed material as food. This action produces rot or decay. The principal economic loss caused by molds is through the staining or discoloration of the wood. No greater injury may be caused by the wood destroyers in their early stages.—A.P.-C.

A-6. Substitutes for Coal. EMILIO DAMOUR. **Chimie et Industrie,** v, 11-7 (Jan. 1921). The main characteristic common to wood, peat and lignite which are named as substitutes for coal, is the high content of moisture or combined water, which may reach 85 to 90 percent in the case of freshly extracted peat. This greatly decreases the "industrial calorific value" (defined as the calorific value obtained by means of a constant pressure bomb calorimeter in which the air is introduced at 15° Cent. and the products of combustion taken out at 100° Cent.) and the temperature of combustion; so that in many cases under ordinary conditions it is not possible to obtain more than 40 percent of the utilizable energy of the fuel. The most obvious remedy is to dry the material. Methods are discussed for gasifying and recovering by-products. Though the problem of the utilization of these lower grades of fuels cannot be considered as completely solved, very appreciable progress has been made, and several plants in France are now working quite satisfactorily without any coal. By combining scientific forestry and cutting methods with modern furnace equipment, the saving effected can be raised from 10 to 15 percent to 40 to 50 percent.—A. P.-C.

A-12 Elastic Properties of Gelatin Jellies. S. E. SHEPPARD and S. S. SWEET, **J. Am. Chem. Soc.,** xliii, 539-47 (March 1921). Measurements of the rigidity of gelatin jellies are given, showing that the jellies follow Hooke's law nearly up to the breaking point. —A. P.-C.

A-15. Action of Dilute Mineral Acids on Cellulose. A. WOHL and K. BLUMRICH. **Z. angew. Chem.,** xxxiv, 17-18 (1921). **J. Soc. Chem. Ind.,** xl, 158 A (March 15, 1921). The insoluble residue (hydro-cellulose) remaining after prolonged heating of cellulose with dilute acids is of the nature of a reversion product rather than an intermediate degradation product; such residues are often more resistant to hydrolysis than the original cellulose, and unsuitable for fodder owing to their indigestibility. In the hydrolysis of cotton cellulose by 0.5-3 per cent hydrochloric acid at 100° Cent., the cupric reducing powers of the residue and the solution were determined at different stages. When, after a certain period of heating, the solution was separated from the residue and both were further heated separately with acid of the same concentration, more total reducing sugar was formed than when the heating was continued without any such separation. It is concluded that reducing sugars which have already passed into solution interact, on continued heating, with the residue in the colloidal phase, and form reversion products.—A.P.-C.

B-4. Gasification of Wood and Wood Waste in Producers. GWOSDZ. Bremstoff-Chem., ii (1920; **J. Soc. Chem. Ind.,** xl, 137A (March 15, 1921). It is necessary to remove moisture from wood gas to secure high flame temperatures, and tarry matter if the wood gas is to be used in gas engines. The latter is specially important and the methods employed in gas producers of English, French and American types are described in more detail. One consists of a producer into which air is below a horizontal grate, and fitted with a ball and charging hopper. Cooling and partial separation of tar and dust are effected in a vertical tower fitted with a water spray. Purification is completed in a centrifugal gas cleaner followed by an impact tar separator. The charge of wood waste must be well mixed if the degree of coarseness varies, and a proportion of fines is advantageous. Another producer has superposed a tall distillation shaft and is capable of dealing with wood waste above 20 mm. size if containing not more than 25 percent of water.—A. P.-C.

E-2. Extraction of Sulphite Waste Liquors with Ether and Benzene. B. HOLMBERG. **Svensk. Kem. Tidskr.,** xxxii, 56-67 (1920); **Chem. Zentr.,** ixc, IV, 753 (1920); **J. Soc. Chem. Ind.,** xxxii, 113-4A (Feb. 28, 1921). The extraction of sulphite liquor with ether yields a tarry substance and a white, crystalline compound, termed sulphite liquor lactone $(C_9H_4O_2.OCH_3)_2$. The latter forms square plates or flat prisms, melting-point 250-225° Cent., soluble in ether, alcohol, and methyl alcohol, very soluble in acetone, but only slightly soluble in water. Sulphuric acid converts the lactone into a monosulphonic acid; on subsequent treatment with water a hydroxy-acid is formed. The lactone is only slowly dissolved by sodium carbonate solution, but is readily dissolved in sodium or potassium hydroxide, from which it is precipitated by carbon dioxide —A. P.-C.

E-2. Action of Sulphurous Acid on Fermentation by Yeast. R. HAGGLUND. **Biochem. Z.,** ciii 299-305 (April 15, 1920); **Chimie et Industrie,** v, 158 (Feb. 1921). The toxic action exerted by sulphurous acid on the fermenting power of yeast must be attributed to the undissociated portion of the acid. The inhibitory power reaches a maximum for a 0.007 normal solution of SO_2 for 1 Gm. of yeast in 25 Cc. of liquid. At a concentration of 0.001 normal fermenting power of the yeast is increased. The inhibitory action of sodium sulphite is comparable to that of potassium sulphate. The inhibitory action exhibited by sodium sulphite when added to yeast is but temporary. Potassium

sulphate favors fermentation, which increases 25 percent in a 0.2 normal solution of potassium sulphate. According to Euler, there is an adsorption phenomenon (Euler and Cassel, **Z. Physiol. Chem.**, lxxxvi, 122, 1913).—A. P.-C.

E-5. Uniform Digester Chip Charges. Paper, xxviii, 1 (March 9, 1921); **Chem. Met. Eng.,** xxiv, 612 (April 6, 1921); **Pulp and Paper,** xix, 382 (April 7, 1921). Data obtained in a mill-scale study by the U. S. Forest Products Laboratory indicate that the digester charge is, in most instances, a reliable unit for pulp mill operations, provided the operation is uninterrupted and the soundness and species of wood do not vary.—A. P.-C.

E-0; F-0. New Wood Digestion Process. Dr. BRUNO POSSANER. **Wochenblatt fur Papierfabrikation,** lii, 26 (June 30, 1921). (Translated by West in **Paper Trade Journal,** Aug. 18, 1921.). Possaner in a lecture mentioned a large number of patents which have lately been secured with a view to protecting new features in pulping operations for the preparation of pure fiber for use in the manufacture of cellulose esters, photographic paper and textiles. Lignocellulose and similar compounds are colloidal absorption entities which do not obey the laws of simple chemical compounds and these views are at the bottom of new processes for the digestion of wood by step-wise processes and by the successive use of specific solvents and chemical reagents. One group of investigators suggests the alternate action of alkalies and acids and in this way more dilute solution can be used and better cellulose results and larger yields are obtained. Step-wise digestion with dilute and then with concentrated solutions has been tried and also the digestion of wood with mild reagents with either a preliminary or simultaneous treatment with hydrolyzing reagents. Both organic and inorganic reagents have been used. Fifteen percent of the impurities in pulp have been removed by treating the pulp with enzymes; acid chlorides have also been employed as well as oxidizing reagents as hydrogen peroxide, oxigen and air. Mention is made of bagasse as a source of fiber as well as of a by-product which may have some value as a foodstuff for cattle. In the preparation of fiber for textile purposes, fibers of less than 10 mm. length are useless, and the fiber must be of uniform length. Consequently the digestion process must be carefully carried out and a mild treatment is necessary. Mention is made of the impregnation of wood with dilute sulphuric acid. The wood retains the acid but the bast of the wood may be freed from the acid by washing and is not injured. A process which may be applied to the linen industry, in place of the present strong alkaline treatment may be beneficial. Many plants, as hemp, contain only a small percentage of bast fiber suitable for spinning, but a large proportion of fibers fitted for papermaking. In some instances, the short fibers have been separated from the long.—H. E. W.

F-4. Uniform Cooking Acid. Paper, xxviii, 1 (March 9, 1921). Very brief description of a series of satisfactory controls for obtaining a uniform cooking acid: Crandon melted sulphur feed attachment for rotary sulphur burners, automatic draft control for the prepention of sublimation of sulphur, Crandon acid control.—A. P.-C.

F-5. Improved Process for Cooking Sulphate and Soda Pulp. HERMANN GEVERS, U. S. patent, number not given. **Paper Trade Journal,** Sept. 1, 1921, page 34. The direct injection of steam into the digesters in the soda and sulphate process dilutes the liquor. The objection is avoided in the indirect method of heating, but the heat of the steam is not as efficiently utilized. In the present process, the digestion liquor is heated in a direct fired boiler. Chips and a part of the liquor used for the digestion are introduced into the digester and the rest of the liquor, preheated in the boiler, is forced by its own steam pressure either into the top or bottom of the digester. Steam from the boiler is used to cook the chips. The improved process and apparatus avoids the necessity of employing a water fed boiler to supply steam for the digestion. The cooking liquor is concentrated by the heating in the boiler and can be introduced as a dilute solution. The liquor in the digester can be kept at such a concentration that expensive steam evaporation and extra fuel are not required for the recovery of the alkali from the resulting black liquor. The introduction of highly preheated liquor into the freshly charged digester reduces the cooking time. No circulating pump is required as the liquor can be forced into the digester by means of the steam pressure in the boiler.—H. E. W.

G-8. Decker Rolls for Pulp. German patent 338,699, class 55D; **Wochenblatt fur Papierfab.,** xxxiii, 2674 (August 20, 1921). In the case of some rolls used for pressing the water from pulp, the canals which have been inserted with a view to aiding in removing the water, have allowed it to run through and again moisten the pressed sheet. The roll which is the subject of the aforementioned patent is said to be free from this disadvantage, for it is provided with flanges which hold in place several rings separated from each other by him disks of a diameter smaller than that of the rings. There are thus slits between the rings and the slit is deeper than it is wide. The pulp does not become pressed into the slit and the water which is pressed out of it is carried away from the seat of pressure as the roll turns. —H. E. W.

H-0. Notes on Bleach and Bleaching. FRANK D. LIBBY, **Paper,** xxvii, 26 (March 2, 1921). Brief outline of the development of the use of chlorine as bleach-agent in the pulp and paper industry, with a description of the method of use of bleaching powder, liquid chlorine, and electrolytic bleach, and the comparison of th bleaching of rags and of sulphite.—A.P.-C.

K-6. Recovering Newsprint. CHARLES BASKERVILLE and RESTON STEVENSON, **J. Ind. & Eng. Chem.** xiii, 213-4 (March 1921) **Paper,** xxviii, 4 (March 30, 1921). For every ton of old newspapers to be treated about 60lb of caustic soda or 200lb of soda ash with about 100lb of American fuller's earth, are placed in the pulping machine and heated to 50° Cent. The paper should be perfectly pulped, and thoroughly washed, requiring about one-fourth less water than for bookstock. The product may be bleached by treatment with a solution of SO_2, which gives a product as white as, if not whiter than, the original unprinted paper. In practice the bleaching has been accomplished in fifteen minutes in the cold with a consumption of 20lb of SO_2 per ton of old papers.—A. P.-C.

K-6. Regenerating Book Paper. CHARLES BASKERVILLE and C. M. JOYCE, **J. Ind. & Eng. Chem.,** xiii, 214-5 (March 1921); **Paper,** xxviii, 4 (March 30, 1921). In reclaiming bookstock an alkaline solution is required to saponify the saponifiable oil in the vehicle of the printer's ink; certain solvents, such as kerosene or gazoline tend to loosen the ink by dissolving the binder, and a solvent, e.g., pine oil, for the rosin used in sizing the paper. The authors use borax (10lb),

(Continued on page 1032.)

CHEMICAL CONTROL FOR DE-INKING PAPER.

By C. M. JOYCE.

(Reprinted from Chemical and Metallurgical Engineering, Vol. 25, No. 6.

During the past fifteen or twenty years, numerous methods for de-inking waste paper have been proposed. Many of these have been tried on a large scale involving great expenditure for equipment and materials. The net result of all this effort, however, may be expressed by saying that most mills are just where they started. The paper maker of today has little faith in new de-inking processes; he is not inclined to spend any time or money trying them. For this reason he is called narrow and unprogressive.

A careful study of the causes of these failures would justify the paper maker in his attitude. Many of those who have proposed de-inking methods have never seen a mill at all, do not have the working knowledge to take account of the interrelations of the market for raw materials and finished paper, cost of chemicals, and special mill conditions. There is no need for extra refinement in de-inking newsprint when the only use for the finished pulp is box board and cardboard filler. There is no use in recommending chemicals worth more than the pulp.

A valuable process for recovering newsprint, discovered by Baskerville and Stevenson[1], has not received the attention it deserves because it has not provided for the mill difficulties in handling slack sized paper. Mill superintendents immediately raised the question whether newsprint can be used successfully in quantity on account of its rapid absorption of water and tendency to form bunches difficult to disintegrate. A mass of newsprint introduced rapidly into a de-inking bath accumulates near the top, forming an unwieldy wet mass which will obten break a paddle before it disintegrates. Without waiting to see how this trouble may be overcome, mill men, with recollections of previous failures, do not care to consider the process. So the old soda boil, followed by washing of the resultant steaming, bad smelling, yellow mass, persists while chemists look on with disgust at the primitive mill methods which are being used.

After such a pessimistic beginning, the reader of this paper will not expect a solution of this important problem and the writer will not be sanguine enough even to attempt to propose one. However, a few general principles have been developed out of years of wide effort with small results, and these will be set forth in the hope that they will suggest improvements which some mill men may find adapted to their conditions.

Apparatus and Treatment.

In preparing book stock and newsprint, it is highly desirable to loosen the ink before subjecting the stock to any pulping process which imbeds the ink in the fiber in such a way that its removal is impossible. It is also desirable to use the mildest possible chemical treatment, best accomplished by adjusting the amount of soda ash to a minimum quantity. A temperature somewhat less than boiling is an undoubted advantage as it makes it possible to turn out a pulp less tendered and less yellow.

Had the outside chemist not already discredited himself by proposing chemicals whose price is out of reason, and apparatus too expensive or unwieldy to handle, he might make a real improvement in the average mill by painstaking adjustment of the factors mentioned.

For de-inking bath, a boiler can be fitted up for external circulation by connecting it at the bottom to the intake of a rotary pump which discharges tangentially near the top of the boiler. By means of a Y-valve connection, the contents of the boiler can be pumped to the washer with de-inking chemicals in an ordinary beater used with the roll lfted clear of the bed plate (so that the ink will not be ground into the fiber), with a steam supply to raise the temperature of the contents nearly to boiling. If the beater has been used only for cold water previously, the wooden filler between the roll knives should be treated to withstand hot water. For removing the loosened ink a Lancaster washer has been used successfully by many mills.

Chemical Control Required.

The form of apparatus used is less important than the careful chemical control of the process. To obtain the desired quality of product, maximum production and minimum cost of chemicals the following factors must be considered: (1) Ratio of water to weight of paper treated, (2) amount and kind of chemicals used. (3) rate of circulation of alkaline bath, (4) temperature, and (5) time. Increasing proportions of water make the pulp flow more freely so that the ink is more readily loosened by the chemical treatment. The amount is of course limited inasmuch as too large a proportion of water curtails the production. The more freely the pulp flows and the greater the agitation, the smaller the amount of chemicals required, because they will more readily come in contact with the pulp. It is important to have perfect circulation in order to avoid the possibility of a bunch of paper lodging somewhere until the chemical treatment is ended and then becoming free and distributing ink specks throhghout the whole mass. Not infrequently excess chemicals are added to overcome defects in reality caused by poor circulation, a practice which adds to the expense and tenders and yellows the fiber. The adjustment of the temperature is also important as too little heat impairs the chemical action and too much heat degrades the fiber. The time of treatment should be determined by taking samples every 15 minutes and washing them on a screen and continuing the treatment until no more ink specks appear.

The success of the chemical control depends on the intelligent co-operation of the chemist with the mill superintendent, a condition which now seems to exist only in the largest mills.

The completion of the trial run of the Premier Paper Mills at Klip River, Germiston, near Johannesburg, marks the inception of paper manufacture in the Union of South Africa. At present the production is confined to wrapping paper, but it is intended to manufacture other grades of paper as the position of the enterprise becomes consolidated. (S. Afr. J. Ind., June 1921.)

The Town Council at Iroquois Falls is planning a public market. The one at Haileybury has proved such a great success, both as giving farmers a chance to market their products efficiently, and housekeepers to buy fresh goods at fair prices that the big paper town wants to do the same. The townsite Office has announced prices of stove wood for the winter as $9.00 per cord for tamarack and $10 for birch, all cut 16 inch lengths.

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[1] J. Ind. Eng. Chem., Vol. 13, No. 3, p. 213 (1921).

PULP AND PAPER NEWS

As stated editorially last week, the year, 1921, will be remembered as a bad fire year. It was brought out at a meeting of the Dominion Fire Prevention Association held in Ottawa, on Thursday last, that the fire loss in Canada to the end of August last was about $6,000,000 in excess of last year. This is a highly discouraging fact, in view of the earnest effort that have been made to bring the vital importance of fire prevention before the community at large. In Ontario, by the way, the loss showed no increase.

Commencing the 1st instant, the Spanish River Pulp and Paper Mills, Ltd. has effected a general reduction of wages. According to a statement made, last week, at the annual meeting of the Company, by the president, Mr. George H. Mead, it has been decided that all those on the pay-roll, from the president downwards, shall accept a ten per cent. reduction in salaries or wages, as the case may be. There is, no doubt, that this is the right way to go about a wage reduction. When mill hands are asked to accept a cut, and find that high-salaried company officials are not asked to make a similar sacrifice, they, not unnaturally, regard the proceeding as inequitable and high-handed. But, when the reduction is made universal, as the Spanish River Pulp and Paper Mills, Ltd., is making it, the mill workers have no reason to complain or unfair or discriminating treatment.

We have been asked by Mr. C. E. Macdonald, secretary of the Engineering Alumni Association, University of Toronto to announce that preparations are under way for the third annual gathering of School of Science men, which will be held in Toronto on the 4th and 5th of next month. Arrangements, this year, are being made on a much larger scale than in previous years, and it is expected that, among the long list of distinguished guests, will be some of international reputation. The graduates are coming from all parts of Canada and the United States, and it is anticipated that upwards of 1,000 will attend the reunion. The program embraces the opening of the new Science Building at the University of Toronto, a dinner dance at the King Edward Hotel, many class reunion luncheons, a Queens vs 'Varsity Rugby game, and finally one of the long-famous "School" dinners on Saturday night. At the annual meeting on Saturday morning, broad questions relating to University policy, technical education and professional matters will be discussed.

The faculty of Forestry at the University of Toronto is next in line on the building and extension scheme of of that organization, according to a statement made, last Saturday, by Dr. Howe, the dean. The converted residence at present in use on Queen's Park is now insufficient to meet the combined needs of the faculty and of the department of botany which share in the space there. Further, the greenhouse is now quite inadequate to meet the demands made upon it, while the experimental garden was recently cut in half, to make space for the new Psychiatric hospital. Several sites have been considered for the Forestry department added Dr. Howe, but no action has been taken so far.

As has been stated previously in this column, the striking printers in Toronto are disposed to be very active in the forthcoming general election. They seem now to be exhibiting a very critical spirit with respect to the contention that a tariff results in high wages and satisfactory employment for the working-man. In fact, Mr. Andrew Gerrard, the president of the local Typographical Union, made the statement last week that the only benefit which could be derived from the tariff was by the employers. He said that his Union had never taken a stand on the tariff, but that, if the empoyers were insistent upon the open shop or free trade in labor, the Union would also insist upon free trade. In this connection, Mr. Gerrard, addressing one of the daily meetings of the striking printers at the Toronto Labor Temple, the other day, told a story of Sir Henry Drayton and a remark that he made when the Tariff Commission was sitting, and the employers appeared before it in search of protection for their industry. "I remember," said Mr. Gerrard, "that Sir Henry asked the employers what wages were being paid in Toronto, and what were the wages in cities in the United States. He was told that the difference was as high as $10 or $12 a week. His answer to the employers was: 'What do you want a tariff for ? ' "

The Riordon Company, last Friday, secured an order from the Bankruptcy Court staying proceedings which have been taken against it on two judgments in the Superior Court. This will prevent further steps by the Brunett Saw Mills, Ltd., of New Westminster, B.C., to realize on a judgment of $3,939, and by the W. A. Marshall and Company, of Montreal, for $8,794. The contention put forward by the Company was that, at the meeting of the creditors a month ago, an extension was granted by the majority of the creditors, and, despite this, the two companies named took action. It is reported that another meeting of the Riordon creditors is scheduled to take place soon.

A propos of the Riordon Company, a good deal of comment is going on in the press just now with regard to the fact that its published balance sheet showed it as owing $858,419 Dominion Government and business profits tax, income tax and interest, while, as it is being forcibly pointed out the average individual is closely watched and threatened should he fall behind in his income tax. "The complaint in regard to the Riordon Company," comments the Toronto Globe, on its financial page, "makes the worse showing because of the serious financial position of the Company at the present time, when strenuous efforts are being made with a view to saving the Company from liquidation. The Riordon Company had a long and enviable career as an industrial, and during the years 1917-20, and, in fact, until the 15th February last, paid a dividend of 10 per cent, on common and 7 on preferred."

It is expected that an announcement as to the resumption of activities at the plant of the Kaministiquia Pulp & Paper Co. of Port Arthur, Ont., will shortly be made.

A federal charter of incorporation has been granted to MacDonald and Conyers, Ltd., a new company with headquarters at Ottawa. The new company is authorized to carry on a lumber, timber and pulpwood business, in all its branches. The capital stock is $100,000.

(Continued from page 1029.)

soap (10lb), kerosene (2 gals.), and pine oil (2 gals.) to 2,000lb of bookstock in water to make a 3 to 6 per cent pulp. The stock is soaked and gently pulled apart in a beater thus reducing the mechanical injury to the fibers to a minimum. Time is saved by heating up the mixture to 75° to 90° Cent. by introducing live steam. After pulping, which requires one hour or less, depending upon the machine used; the ink and chemicals are washed away by one of several well-known washers. The pulp may then be bleached or tinted as desired. A selected combination of the chemicals may be used instead of all four with selected lots of waste paper when the composition (including ink and binder) is known. A superior product of desired strength, length of fiber and cleanliness has been obtained by this process. (U.S. patent No. 1,351,092.)—A. P.-C.

K-7. Papermaking from an Engineering Point of View. T. D. NUTTALL, **Paper,** xxvii, 26, (March 2, 1921). Description of the development of the beating engine, with a brief discussion of the advantages of a good circulating hollander, of the effects of cutting and rubbing action, and of power consumption of beaters.—A. P.-C.

K-8. Ultramarine Blue in Papermaking. LOUIS P. SCHWEITZER, **Paper,** xxvii, 26 (March 2, 1921). Brief description of the composition and properties of, and methods of testing ultramarine.—A. P.-C.

K-10. Preparation of Highly Sized Paper. German Patent 339,594, addition to 338,395. **Papierfabrikant,** xxxii, 849 (August 12, 1921). The patent covers the use of products prepared by condensing alpha and beta naphtols and other naphthalene derivatives with formaldehyde as in the case of phenol and cresol, in acid or alkaline solution. The products are soluble in alkalis and are excellent sizing materials. Naphtols is an indifferent solvent, as acetone, is treated with 1 percent concentrated sulphuric acid and formaldehyde is then added, the resin being precipitated. In sizing with this product, a solution containing 10 to 50 grams per liter of the resin is added to the stock in the beater and alum or other acid product is then introduced. It has been shown that an addition of 2 percent of a 35 to 40 percent solution of the alkaline naphthol-formaldehyde resin is sufficient to size paper completely and 3.5 percent rosin size containing 60 to 70 percent rosin must be used to obtain results similar to those secured with this resin.—H. E. W.

K-12. Ventilation of Machine Rooms in the Paper Mill. H. S. TAYLOR, **Pulp and Paper,** xix, 183-8 (Feb. 17 1921); **Paper,** xxviii, 1 (March 9, 1921). Address delivered at the meeting of the Technical Section of the Canadian Pulp and Paper Association, Montreal, Jan. 20, 1921. Discussion in **Pulp and Paper, xix, 299-300** (March 17, 1921). The problem of the ventilation of paper mill machine rooms consists essentially in first removing the volume of moisture-laden air rising from the machines and repacing the volume removed from outside sources, and, secondly, insulating the under side of the roof slab with air of a temperature that will be above its dew point. Two methods can be used for removal of the air; natural draft and positive exhaust. The former is serviceable in machine rooms where production is low, but has not the capacity for the removal of large volumes required under modern practice. Two methods can also be used for supplying replacement air: through doors, windows or other specially designed openings, or else through a properly designed blower system. For raising the temperature at the under side of slab, roof structure, and walls, there are two methods available: through direct radiation suspended from theslab, or through heating the replacement air. The relative merits and estimated cost of installing and operating (in a 2-machine, 100 t. room) positive removal and replacement system with heat supplied through the incoming air and from direct radiation, respectively, are discussed, and the superiority of the former is shown. For the proper removal of the moisture-laden air a hood of proper design is absolutely necessary. For a room housing more than two machines, vertical uptakes must be used; and even with a two-machine mill the vertical uptakes are preferable as the discharge is direct and cost of installation less. Each hood should have three uptakes, each 6 ft. in diameter, the two nearer the wet end of the machine being provided with fans, while the one at the drier end of the hood can be designed for natural draft. The exhaust and replacement fans should be so adjusted that the latter furnish a little more air than the former eliminate, so as to keep the machine room under a slight pressure. In this way openings in floor and walls cannot in any way cause any interference with proper operation of the ventilating equipment, whereas, should this condition of pressure be changed to one of partial vacuuc, through the capacity of the exhaust fans being greater than the capicity of the delivery fans, a rush of air through any opening will result. This inrushing air during the winter season will be of extremely low temperature if from the outside, and if from the basement will be laden with moisture in addition to its low temperature. The more insulated the building structure itself is against outside temperature, the less steam is required from the ventilating system, and the lower the cost of operation. With a system of blowing heated air directly within the drier section, the volume of air distributed by such a system can be deducted from the volume required for machine room ventilation, as the volume of replacement air is simply a total of that distributed through a simple or multiple system.—A.P.-C.

K-22. Characteristics of Cigarette Papers. LOUIS SCHWEITZER, **Paper,** xxvii, 27 (March 16, 1921). Brief description of the different varieties of cigarette papers, of the properties required of a good paper (nature of rags to be employed, appearance, combustibility) and of the methods of increasing the combustibility of the paper.—A.P.-C.

M-1. CO_2 and Combustible Gas Recorder. ROLAND MOELLER, **Paper,** xxvii, 24 (Feb. 16, 1921). Furnace efficiency, as distinct from boiler efficiency, can be properly tested only by continuous gas analysis which not only measures the excess air present at all times, but also promptly detects and measures the presence of combustible gases in the flue whenever they appear. It is important to have not only a record of the CO_2 content of the flue gases, but also a means of detecting combustible gases practically as soon as they form. The Duplex Mono Gas Analyzing Instrument, by means of which this object can be obtained, is described, and the accuracy and value of the records are discussed.—A.P.-C.

P-4. Prompt Care of Minor Injuries. National Safety News (Jan. 24, 1921); **Paper,** xxviii, 2 (March 16, 1921). Suggestions for an intensive campaign showing the necessity for the men to come to the hospital or first aid room with minor injuries, which in many plants is more difficult to impress on the men than accident prevention.—A.P.-C.

SPANISH RIVER OUTLOOK GOOD.

Toronto, September 28.—An encouraging statement of the condition of the Canadian paper industry was presented at the annual meeting of the Spanish River Pulp and Paper Mills, Ltd., held here today. This statement, which was offered by President George H. Mead, brought good cheer to the meeting of shareholders and was supplemented by Mr. Mead later when he stated that the Espanola mill, which had been closed only temporary, resumed operations on Tuesday.

It was also announced at the meeting that, conforming to the tendency of the time, the company had made a reduction of at least ten per cent. in the remuneration of all salaried employees from the president down.

Another question as to whether he considered the price of newsprint as nearly stabilized Mr. Mead answered by saying: "I think it is very rapidly getting to a stable condition. Costs may not be down to bed rock, for we feel that there will be continual reduction in this direction."

Regarding market conditions, Mr. Mead said: "I think the consumption of newsprint is on the upgrade, and with a gradual return to normal conditions such as we are having in the United States, which appears to be on the way in Canada, the newsprint industry is reflecting that improvement. The newspaper is the best medium for bringing to the public attention the sale of any commodity or article, and, therefore, I think, as business conditions improve the newspapers must automatically obtain a reflection of that improving business. United States paper mills that turned from special kinds to making newsprint when business became dull in their lines are now returning to their own specialties, and thus improving the position of the mills that make newsprint alone."

In his remarks to the shareholders Mr. Mead made this general reference to the industry as a whole: "I have been astonished at the lack of confidence that seems to have been displayed by the public in the paper industry of Canada. To my knowledge there has been no paper company in Canada or up to the present time in the United States that has found any difficulty in meeting all its obligations. The paper industry of both countries has been operating upon larger percentage of production than perhaps any other industry of anything like the same magnitude that we have. I consider that Canada is very fortunate in having for one of its greatest and one of its basic industries the newsprint paper business.

"Through a time of exceeding depression, perhaps greater than any before known by the present generation, the newsprint industry has been operating on a production of approximately 80 per cent. of capacity and any industry that can operate upon such a basis, if the plants are properly managed, and the business is given the right amount of care by a conscientious board of directors should be able to meet every fair and proper obligation."

Temporary Shutdown.

Concerning the shutdown of the mill at Espanola for the past week Mr. Mead explained that there had evidently been a misunderstanding as the management merely took occasion in a time of operations under capacity to close down for a few days to carry out some improvements. The company's plants had operated at practically full capacity during July and August following the shutdown from labor troubles in May and June. Owing to low stocks of customers, the demand had been increased for some weeks after the end of the strike, and operations now were around 80 per cent. of capacity.

The directors were authorized whenever they may see fit, to purchase or acquire shares or other securities "in any other corporation or corporations having objects or in part similar to those of the company, or carrying on any business capable of being conducted so as directly or indirectly to benefit the company, and to use the funds of the company for such purpose." President Mead explained that the passing of this bye-law merely restored to the company the right it possessed under its charter as a provincial company until two years ago, when that right was removed from all companies by an amendment to the general law. "It is necessary in the carrying on of our business," said Mr. Mead, "that certain driving companies and river companies and pulpwood companies and sometimes others be held in a small or larger interest, by the Spanish Company."

Mr. Scott commented on the fact that he had recently returned from Australia and New Zealand, and, while in the South Pacific he had seen the business efforts of competitors, he had heard nothing of the Spanish.

President Mead replied by saying that in the export trade from Canada the Australian field was cultivated by the mills with the lower freight charges, while the mills in the interior looked after the market in the middle states which was the largest consuming area.

A hearty vote of appreciation to the directors was passed at the meeting and the former board was re-elected as follows:

George H. Mead, president; P. B. Wilson, Thomas Gibson, C. E. Read, T. Watson Sime, G. R. Gray and T. H. Watson.

The former officers were also re-appointed as follows: President, George H. Mead; vice-presidents, P. B. Wilson and Thomas Gibson; secretary, J. G. Gibson; treasurer, A. H. Chitty; manager of manufacturing, C. H. L. Jones; and manager of woods, G. R. Gray.

THE PAPER INDUSTRY IN LATVIA.

The output of the five chief paper mills in Latvia prior to the war was 27,468 long tons of paper, including 21,774 tons of best and medium-grade paper, of which 85 per cent was exported to Russia and Poland. The most important mills were at Ligat and Sloka, the former making writing and drawing paper from rags and the latter stained papers for albums, envelopes, etc. Both mills suffered during the war, but reconstruction is in progress and it is anticipated that the Sloka mill will soon restart operations, thereby obviating the need for importing cellulose from Finland, Esthonia, and Germany. There is a large mill, owned by E. Bruhns & Co., on Lake Jugla, and brown wrapping paper is made at Staizele and Litene; the Staizele mill alone can supply the Latvian requirements for wrapping paper (about 4000 tons) and at Litene about 1613 tons of mechanical wood pulp can be produced and made into printing paper. The entire paper consumption of Latvia amounts to about 6613 tons per annum, and if further wood pulp machinery were installed, the country would be capable of exporting in large quantities. (U.S. Com. Rep., May 1921.)

Until you fill the job you now have, it will be hard to convince the boss that you can fill a bigger one.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 1st Oct.—The improvement, which has been noted the last few weeks, in most lines of the paper industry, is still being maintained. In fact, in many branches of the trade, business done during the last week or two has been very satisfactory. And not only has the business been satisfactory, but the enquiries that are coming along in steadily increasing volume seem to presage still better things in store. The general tone, in short, is one of increasing firmness.

An adverse factor is the continuance of the long-drawn-out printers' strike in Toronto. This has had, during the four months which it has already lasted, a detrimental effect, of both a direct and an indirect kind, on the paper business generally. One hears it frequently said by paper men that, were this dispute satisfactorily terminated, business would take a sharp turn for the better. It is because of the detrimental effect that the strike has had, and is still having, on business — a detrimental effect of a more pronounced kind than might have been previously anticipated— that an attempt has been made, in these columns, to keep readers of the Pulp and Paper Magazine very fully informed alike as to the merits of the struggle and as to its developments, from time to time. Unhappily, thus far such developments as have occurred have been rather in the direction of widening, than of closing, the breach between the employers and the strikers. The progress that has hitherto been made has been all in the wrong direction — if such an Irishism may be pardoned. On the most important phase of the dispute the issue has been definitely joined and the lie given, without any necessary beating about the bush, by each side. The men claim that the master printers promised that the forty-four hour week should come into operation on the 1st June, 1921, and that they have gone back on their word. On the other hand, the organization of the master printers, through Mr. Sutherland, its secretary, and the Rev. S. W. Falis, chairman of its Defence Committee, flatly denies that the promise of a forty-four hour week was made.

While it is generally thought that logging operations in the woods this season will be on a much more restricted scale than usual, and while the market for pulpwood at the present time is unusually listless, there are, of course, much reduced, for whereas, last year, a significance a little later, of a stimulation in the production of lumber. The Riordon Company is still cuttings logs in the vicinity of Hawkesbury, though its operations may soon cease by reason of low water. The mills at Kenora and Thessalon are still operating, those at the latter being on a twelve-hour shift, with prospects of continuing until quite late in the fall. A lumberman with important interests in Northern Ontario, said, last week, that his Company proposed to operate actively in the woods during the coming winter. He has secured a good market, he added, in Great Britain and United States. Operating costs in the woods are, of course, much reduced, for whereas, last year, a man could command $70 and $75 a month with board, this year he is glad to get anything over $26 a month and board. Announcement is made that the Shevlin-Clarke Lumber Company, Ltd., in order to provide against unemployment in the Rainy River district, during the coming winter, has come to an arrangement with the Crown, relative to certain matters in dispute, which will ensure its cutting on its limits this winter.

PULPWOOD.—Notwithstanding what has just been said, however, it is generally believed that operations in the woods this winter will be on a greatly reduced scale. In the matter of demand for pulpwood, there is no improvement to chronicle. Most of the mills are so stocked up with pulpwood that they will not need to come into the market, to an appreciable extent, till this time next year. Moreover, the fact that the price of newsprint was on the toboggan has introduced an added element of caution into their buying.

NEWSPRINT.—On the whole, the newsprint outlook must be pronounced to be satisfactory. Quite a few mills are running at 80 per cent. capacity and over, with the majority of them running at 75 per cent. capacity. A good fall demand for newsprint is anticipated, but it is fairly certain that the demand for some time yet is not going to be equal to the full capacity of the mills. It must be remembered that several mills have, within the last year, very largely increased their total newsprint capacity. At the present moment, there seems some doubt as to whether the price of newsprint which has been set at $80 a ton for the current quarter of this year will actually prevail during the whole of the period named.

BOOK PAPERS.—There can be little question but that the recent reductions in book, writing and bond papers has encouraged buying. Orders are coming in satisfactorily as regards number, and — what is not less gratifying — they are showing a tendency towards becoming larger in individual bulk. These reductions were a distinct surprise, and there are "wise guys" who say that they will be followed by further reductions yet in the near future. This, however, is stoutly denied by manufacturers, who say that prices are now on a definite basis which will hold for the remainder of the year.

KRAFT.—The representative of one of the large kraft mills told the writer today that the business done in September considerably exceeded that in August which, in its turn, was a good deal in excess of the July business. He added that, as regards the future, "The outlook is very promising." Moreover, he mentioned that far more enquiries were being received from Great Britain, and this fact he considered, when taken in conjunction with the reports of improvement which were being received as regards the kraft possibilities in that country, augured well for the prospects of export trade.

WASTE PAPERS.—The market in waste papers has been lifeless and listless for a very long while. But, within the last two or three weeks, demand has substantially increased, and, in response, there have been some few advances in price. Orders for domestic rags are coming in more freely, and there is a prospect of an increase in prices in this line, before long.



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BOX BOARDS.—Owing largely to the increased demand of the paper box industry, there is a gratifying increase of activity in the movement of board which is keeping the mills busier than they have been in a long while.

TOILETS AND TISSUES.—Business in toilets and tissues continues to be of a satisfactory kind.

NEW YORK MARKETS.

New York, October 1.—(Special Correspondence).—All indications point to continued growth in activity in the paper industry. Demand for practically all grades of paper is on the rise, with both consumers and jobbers buying in appreciably larger quantities. Jobbers are once again filling their shelves with paper, indicating that they are of opinion that prices have about touched bottom, and that supplies acquired at prevailing market levels will soon prove to be a profitable property.

A pleasing development of the week in New York is the settlement of the difficulty in the printing trades locally. Up to last Thursday it appeared as if another strike would occur in the book printing branch of the trade, but the printers' union has agreed to arbitrate the question of wages to prevail over the coming year and all danger of a walk-out seems past. Printers are asking for an increase of $5 per week in wages while employing printers have proposed a cut of $10 a week, arguing that whereas virtually all other industries have this year reduced wages, the pay of printers has advanced, an increase of $5 a week being granted last January. It has been agreed to submit the matter to arbitration, and in the meantime the wage scale will be continued unchanged.

Some of the reports received in connection with the newsprint trade are fairly bullish; others tend to have a depressing influence. An official of one of the large newsprint producing concerns in this country contends that there is a possibility of higher prices on newsprint by the end of the year.

Other reports, of a bearish character, say that interests representing Hugo Stinnes, the German industrial magnate, will invade the United States market with 2½-cent newsprint. The paper to be sold at this price basis is said to be of standard specifications and will be delivered c.i.f. Atlantic or Gulf ports on 30-day terms. Offerings are expected to be made at once in New York by a representative of the German paper interests, the price mentioned being 1½ cents a pound under the prevailing domestic price and one cent per pound below the present quotation of Norwegian, Danish and Finnish manufacturers.

The newsprint market locally is fairly active. Publishers are buying in comparatively good volume, and the movement of supplies into contract channels continues at a regular pace. Consumption of newsprint is certainly on the rise. Newspapers in New York are printing large issues almost every day, advertising picking up at a rate necessitating larger-sized papers. Today inaugurates the new contract price basis of 4 cents per pound, or $80 per ton, f.o.b. mills on standard newsprint in rolls, and expectations in the trade are that the lower price will serve to stimulate demand considerably.

Figures compiled by the Federal Commission in its August report on the paper industry go to show that matters are appreciably improving in the paper trade. A total of 442,519 net tons of paper of all grades was produced by United States mills in August, showing an increase of 72,090 tons over the July output. Despite this sharp increase in production mill stocks decreased during August, amounting to 274,009 tons at the end of the month in contrast with 279,544 tons at the beginning of August. This indicates that manufacturers are shipping out much larger quantities of paper and that they are gradually liquidating a part of their holdings notwithstanding that they are enlarging their output. Doubtless the figures for September will show an even more encouraging statistical position because it is freely acknowledged that business in paper of various kinds showed greater improvement during the past month than relatively in any month thus far this year.

Wrappings are firm in price and are moving in in- offering up to 3 cents a pound for Scandinavian kraft kraft wrapping mills have enough business to keep them engaged for two months or longer, and prices are trending upward as a result of the larger demand and the strengthening of raw material costs. Tissues are steady and under good inquiry. Fine papers are moving in better amounts every day, with jobbers taking a good portion of supplies for stocking-up purposes. Box boards are in a healthy and fairly lively market position and prices are firm. Plain chip is $42.50 to $45.

GROUND WOOD.—An indication of the strong statistical position of ground wood can be had from the Federal Trade Commission's report of August, which shows that production during that month was below that in the preceding month, amounting to 73,666 net tons, against 75,405 tons in July, and that mill stock decreased sharply, totalling 166,601 tons at the end of August, compared with 196,088 tons at the beginning of that month. The probabilities are that mill holdings

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have been further reduced in September, as reports generally state that grinders have been unable to increase their operations owing to low water in mill streams.

The market is quite firm in tone and most of the ground wood being offered out is finding ready buyers. Demand is general in character, coming not alone from newsprint mils but also from tissue, wrapping and board manufacturers, who are absorbing relatively large amounts of mechanical pulp. Prices hold steady at an average quotable basis of between $29 and $30 per ton f.o.b. producing plants, with some sales reported figuring out at as high as $40 a ton delivered consuming points.

CHEMICAL PULP.—There has been a sharp advance in kraft pulp prices. Sales of Scandinavian kraft on the spot in New York have been recorded at 2.75 cents a pound ex dock or warehouse, denoting a rise of fully half a cent from the low levels touched by the market recently, and buyers are now reported offering up to 3 cents a pound for Schandinavian kraft for spot shipment without finding pulp available. Indications are that spot stocks of foreign kraft have been completely liquidated by importers, and higher prices are named by manufacturers for pulp for forward shipments from primary sources, around 2.75 cents being the minimum quoted by the Swedes at present.

The advance in kraft is viewed in a very bullish light by members of the pulp trade who say that the increased demand and higher prices for kraft are forerunners of greater activity and better prices on sulphite. Prices on the latter are firmer in tone and display an upward tendency though no actual advances have been noted. Demand appears to be slowly but surely expanding and the market is characterized by more trade activity than has been evident in some time.

RAGS.—The rag market is at last beginning to evince a stronger tone. Dealers are holding rags with considerable more firmness and the prices quoted are mostly on higher levels than have been prevailing. In fact, sentiment is so strongly in favor of a rise in values that a majority of dealers and packers are holding off in selling, being satisfied to wait for a while in anticipation of higher prices. Roofing rags are moving upward in value in a fairly spectacular manner. Sales in the Middle West have been reported at as much as 1.25 cents per pound at dealers' points, while mixed satinets of No. 2 roofing stock have sold in New York at 85 to 90 cents a hundred pounds f.o.b. this city. Old whites are higher, with dealers quoting 4.50 to 4.75 cents a pound on No. 1 repacked, 3.75 to 4 cents on No. 1 miscellaneous and 2.25 to 2.50 cents on No. 2 miscellaneous whites. Old thirds and blues are firming, with sales of repacked material reported at 2 to 2.25 cents a pound at shipping points. New cuttings are very firmly held. Packers want 9 cents and more for No. 1 white shirt cuttings, 5.25 cents for fancy shirt cuttings, 3.50 cents for No. 1 washables, 5.75 cents for blue overall cuttings and 7.75 cents for unbleached muslins.

PAPER STOCK.—High grades of old paper have scored further price advancement this week and are still going strong, with demand from consuming quarters quite brisk and with dealers complaining of difficulty in locating all the supply wanted. No. 1 soft white shavings have sold at 3.25 cents per pound f.o.b. New York, hard white shavings of No. 1 quality at 3.85 cent, old book stock at 1.50 cents, overissue magazines at 1.75 cents, ledger stock at 1.75 cents, old kraft paper at 2.15 cents, folded newspapers at 65 cents and No. 1 mixed at 50 to 55 cents. Mills have let up in their buying of low grades to an extent but this has had little influence on prices, packers viewing the quietness as a temporary affair and not pressing matters. On the other hand, demand for the better grades is steadily expanding, with an especially strong inquiry for soft shavings and book stock.

OLD ROPE AND STRINGS.—Old rope is firm at a market basis of around 4.25 cents a pound for domestic manila rope of No. 1 grade. Old bagging is quiet but steadier in tone, with dealers asking 75 cents per hundred pounds for No. 1 scrap.

SAY IT WITH PUBLIC JOBS.

(Editorial from Engineering and Contracting, Chicago, Sept. 7, 1921).

In his Labor Day address Secretary Davis of the Department of Labor urged an immediate increase of public works expenditures. Pointing out that fully six million workers are jobless he said: "This year Labor Day must be dedicated first of all to meeting this imperative human need of the idle."

Many newspapers have been using the headline, "Say It with Jobs," in urging employers to give work to ex-army men. But the advice can not be folowed by many employers, without danger of bankruptcy, until there is assurance that there will be a demand for the products of the men they hire. However, there is one class of employer than can and should act upon the "Say It with Jobs" slogan. We refer to cities, counties, states and the Federal Government. The governments are employers who need fear no bankruptcy, for it is not necessary that their products be sold. Roads, streets, waterworks, sewers, school buildings, and all that class of construction known as public works, are the products of the employing public. The economic demand for these products are never filled, for the public is never as alert to meet economic demands as are the private corporations. There have been six years of subnormal construction of public works in America, folowing centuries of inadequate appropriations for public works.

If the last clause is questioned, consider the significance of the fact that scarcely 15 per cent of the total mileage of country roads have a surface that is graveled, macadamized or paved! More than half the streets and alleys of our cities remain unpaved, and, of those that are paved, fully half hould be repaved in order to reduce the wear and tear on automobiles and motor trucks. Only a small fraction of our city water supply is filtered. We have next to no sewage disposal plants. Our waterworks pumping plants are largely obsolete and inadequate in capacity. Our schools are crowded to a disgraceful limit. Our city children lack adequate playgrounds and our city adults have almost have almost no playground at all! These are but a few of the outstanding facts that indicate the woeful inadequacy of our public works.

We mention such inadequacy because there are many local complaints whenever increased taxation for public works is proposed. It is, in fact, this never ceasing opposition by taxpayers that has always resulted in less than adequate expenditures for public works. We believe the time has come to brush aside all such selfish

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opposition to public improvements, not merely because the improvements are needed but because there are millions of idle men who need the work that can be given them by the public. It is cheaper, in fact, to support men by giving them work than to support them by giving them charity. In any event they must be supported.

Let it not be overlooked that every man thus given a job automatically creates a job for at least two more men. Work begets work. The wages that are paid to the construction worker, quickly are passed along to the textile worker, the food producer, the moving picture actor, etc. Yes, we include the "movie man," the producer of pleasure—and why not? Why do we work but to add to our luxuries? There are many men of such myopic vision as to things economic that they see no useful work save that adds "necessities." Heaven help their shortness of sight! It is more than 120 years since Americans ceased working merely for necessities. In Engineering and Contracting of August 3 it was shown that the buying power of the average worker is five times as great today as in the year 1800. But in the year 1800 our forbears were not without the "necessities." They had their log houses, their homespun clothes, their "three squares," and—precious little else.

On day's work in a week would now buy all that a Daniel Boone earned in five days, and with 8 hours' work instead of 12, at that. So, four-fifths of all that we buy is purely luxury, measured by the standards of early nineteenth century.

It is true that all the men and women now out of jobs form only 15 per cent of the total number of income earners and this is about the maximum percentage of idle that every "hard times" since 1893 have produced; but, like Mercutio's wound, "It is enough" —enough to kill happiness for three times six million people. Happiness for these idle people and their families is fortunately to be had at no distant day and at no ultimate cost, if the public will rouse itself to its duty. Bonds for all needed public works can be sold in every American city, provided the newspapers and magazines will support such a project as whole-heartedly as they supported the Liberty Bond issues. Let us call these new loans Prosperity Bonds, and let us throw all our enthusiasm into the campaign to sell enough of them this fall and winter to insure a general revival of business.

MOISTURE TESTING ; WHAT ABOUT THE MAN ?

By T. LINSEY CROSSLEY.

In seeking to establish a standard for moisture testing, are we not focusing too much on the method and too little on the man ?

Can it not be truthfully said that most of the troubles in moisture testing have arisen because the work was left in the hands of unqualified persons? First, persons in mills with no idea of the importance of their office, and employed by people who had no idea of such importance, and, secondly, persons with scientific training, but no idea of pulp mill conditions, suddenly asked to act as referees.

Recent trend toward excessively finicky detail is not likely to improve the conditions.

The form of test that can be made in the simplest and quickest way, and get correct results in the shortest possible time should be the aim ,not the perpetuation of any particular form of test.

The idea of limiting the making of referee tests to individuals with certain qualifications is good, but among those qualifications should be that of actual experience in mills.

The attitude should be that of the surgeon approaching an operation for which there is a well known technique, but which is always governed by the circumstances and by the idiosyncrasies of the patient. No surgeon would agree to standardize an operation, and no referee should be required to make standardized tests, but all referees should be informed as to previous work on the subject and the circumstances of the present case, otherwise they become mere machines, and the mills would save by employing any honest handy man.

The case is different where no referee is called in, but in these again the facts are wanted and may be obscured by a dictum as to the use of this or that form of test. In such a dispute the agreement in result of two differing forms of test would tend more to a satisfactory settlement than concordant figures obtained by repetition of an identical procedure.

An instance in each case can be cited.

In the first example, that of an unqualified referee, the material was in 500-pound bales of dry sheets. They were tested by the usual man and found short. The mill's chemist then tested in a different way with the same result. A claim was made and the shipping mill sent a man from a firm of analysts who had no mill experience. He arrived without notice in the absence of the chemist, broke a number of bales over the room, cut wedges with bases four to eight inches wide, and, ignoring the fact that the pulp had been shipped two months before and had stood for some weeks in a well ventilated ware-room, did not reweigh any part of the shipment but based his calculations on the shipper's gross and claimed to have confirmed the invoice. The consignee accepted his results and paid his fees and expenses to avoid further trouble because the referee had made a "standard wedge test." If the chemist's advice to fight it out had been taken, it would have been brought out that the wedge method was not standard for dry pulp in sheets, and had been found faulty for this work by one of its originators,* who had devised the method for a very different class of pulp and package.

In the case in point the referee prejudiced his whole case by not weighing his test bales or reweighing the carlot, which had stood in an open room for weeks in which case the bases of his wedges would represent the portion most likely to be affected, as being the exposed edges of sheets.

A case of the other kind can be cited in which two mills made tests in the same way and were quite satisfied until a third mill made the test in a different way and was able to demonstrate the weakness of the test made by both other mills and incidentally made good on a heavy claim.

By all means let us get at the facts regarding the moisture test, and put them on record for guidance, but let us not be in too great a hurry to shackle our referees.

*R. W. Sindall, "The Sampling of Wood Pulp," pamphlet, published by Thomas Poulter and Sons, London. On page 10, referring to tests on dry pulp in sheets, is the following: "It was found that the first method, of cutting wedge-shaped pieces, invariably gave too low a percentage."

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., October 13, 1921. No. 41

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New York markets 1058

Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

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H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

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Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

Subscription to any address in Canada, United States and British Empire, $5.00 yearly. Other Countries Postage Extra. Single copies, 15 cents.

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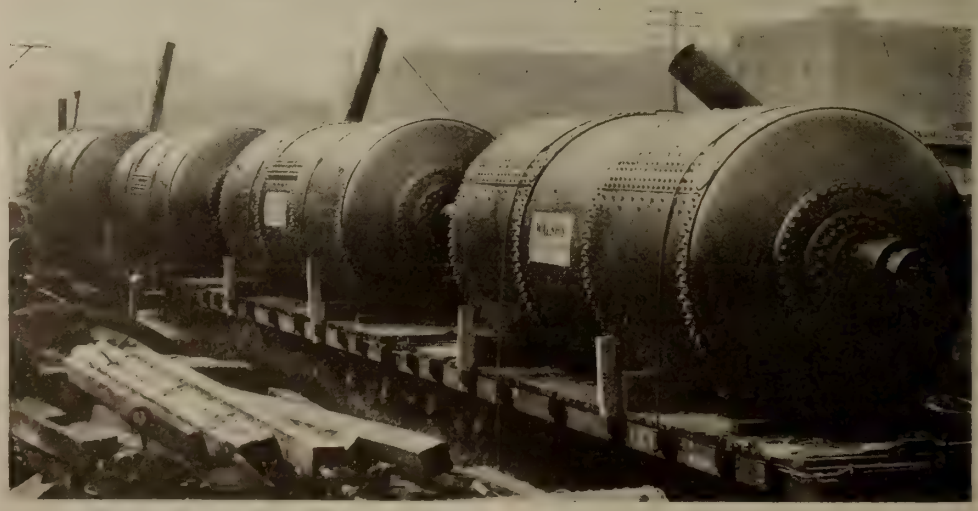
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EDITORIAL

KNOCKING OUT THE PROPS.

The export of pulpwood from Canada is knocking the props from under the pulp and paper industry in the Dominion. In the first place it is reducing the reserves in Canada while at the same time tending to lengthen the life of present stands in a country to which the wood is exported and providing a cover under which reforestated areas will have an opportunity to arrive at a productive age. Our forest, then, may be likened to a tree which is being chopped at on two sides. The tree will fall just that much sooner and our forest industries will collapse prematurely because of the undermining influence of excessive exports. It is quite obvious that, by shortening the productive period of our standing forests through excessive exports, and at the same time assuming that our neighbours are awake to the necessity of reforestation, there will necessarily come a time when they will be producing pulp from conveniently situated areas in competition with the product that we shall have to make from wood cut and transported at an expense that will have continually grown greater until its cost will be a serious disadvantage to the Canadian mill. We are not argueing for an artificial situation that will falsely encourage dependence on present stands of timber for future operations. The fact is, that the present stand is no more than we require to keep our mills going until properly protected re-growth becomes available. By cutting into this margin we are simply inviting a period of inactivity for our wood using industries.

The importance of some protective measure becomes apparent when one stops to consider the character of the country that is producing the timber used in our mills today. The larger proportion of land logged over is purely non-agricultural forest soil and must be maintained as a forest, not only to maintain timber growth but to prevent the disappearance of the very soil itself.

Doubtless most of the wood which is exported is taken from land which is properly classified as agricultural and which will in time be cleared and cultivated. It is very likely that some of this wood is taken from non-agricultural lands and it is possible that some of it is sold by settlres who have taken it from lands which they did not intend to settle or which border on their own establishments. The wood which is so marketed does not contribute through taxes, stumpage or assessments to the expense of protecting the standing forest and incidently the homestead of the settler. It is time that the million cords or so which we export should bear its share of this necessary burden. In fact, this wood should contribute enough to bring our forest protective agencies practically to a 100 per cent efficiency basis. We are very far from that at the present time. The wood which is cut from crown lands and necessarily used in Canada pays not only for the protection of what is left but has to cover also the protection of the wood which is permitted to be freely exported. The situation is not fair to the domestic consumer of Canadian wood. He is paying fire insurance on his competitor's property, as it were.

Another point which might be mentioned in this connection is that the cutting of the wood which is exported contributes probably a larger proportion of the fire hazard than the lumbering of wood on crown lands and, as has been remarked, without contributing to the expense of protection.

The troubles outlined above could be at least partly corrected by an export tax, the proceeds of which should be expended entirely in the protection and conservation of the forest. There are several possible effects of such action to be considered. First, but not necessarily most important, is the effect on the American manufacturer. Such a tax will undoubtedly make his wood cost more and might result in a slightly less volume of exported wood. If this volume is decreased it will very likely be because the extra cost to the mill will permit a greater haul of wood harvested in other parts of the United States or possibly even brought from other countries. This of course, would prolong the life of our own forests. It might bring in a little less United States money temporarily, but in the long run would result in a greater aggregate of payments to the Canadian producers. It would mean a little more mining of American wood and a little more conservation of Canadian wood. There would doubtless be fewer fake settlers who squat on an area with the sole purpose of clearing and selling the timber. There would be more wood sold by farmers and settlers to the Canadian mills. The demand by the Canadian mills is unquestionably sufficient to use the wood that a settler could take from as much land as he can clear and cultivate in any season.

The complaint of the settler will be heard to the effect that an export tax will restrict his market and put him at the mercy of the pulp wood buyer for the Canadian mill. A moderate tax however, would still leave sufficient demand for export wood to assure him of a compeitive market and a fair return. There is no doubt but that the farmer can produce wood more economically than the mill. In the first place by doing his own work he works most efficiently. He does not have to maintain a camp, he has no expensive overhead, administration, and supplies and for the most part he is consuming his own produce and has an opportunity of using his own labor that would otherwise be wasted.

There is no doubt but that in times past the mills having a monopoly of certain districts have squeezed the farmer until he did not get a decent day's wages for his wood cutting operations and it is the duty of the mills in their own interest, to give fair treatment, even generous treatment, to the settler.

With provision protecting the settler against unfair exploitation, there seems no question but that an export tax of pulpwood will result in better protection and conservation of our forest, which is a problem which deeply concerns every Canadian citizen and which is a factor of greatest importance in the future development and prosperity of the Dominion.

TRADE MARKS WANTED.

There seems to be a lack of appropriate and distinguishing trade marks for individual makes of Canadian pulp and paper. A few firms are using distinctive marks on some of their product, but there are many which do not even present their name on the individual package. If the purchaser is patriotic enough to ask for a Canadian product and most of them will at least be attracted by some token that the article is a Canadian product, we should think it worth while for the manufacturer to use a label which would convey the idea in attractive form. An instance came to the attention of the editor not long ago when in purchasing some paper napkins the clerk was asked whether they were made in Canada. The clerk did not know and there was nothing on the package to indicate the country of their origin. To one who did not know the name of the mill, which fortunately did appear, the chances are at least even that a customer not particularly interested in the Canadian paper industry would have taken the imported napkin, shown by the side of the Canadian product.

It is noticeable also in the shipping rooms of the paper mills that the trade mark of the Association is not as much in evidence as it should be, but even with the Association mark on the outside of the package there should be some way of knowing the manufacturer of the paper. In the case of a watermarked product, it is possible for one knowing the manufacturers of the paper to tell at once whether it is Canadian paper and in probably the majority of our watermarked papers there is now to be found the words "Made in Canada" but the outside of the package usually does not carry such a message.

We do not often see an unopened package of wrapping paper but the chances are that a good deal of it is not labelled, either as to the country or mill of origin. In the case of most toilet papers there is generally a name for the particular type of package but nothing to indicate the manufacturer.

A short time ago the editor attempted to get some information on the origin and significance of trade marks but we succeeded in getting replies from only a very small percentage of Canadian mills. This would indicate that some companies do not attach much importance to the trade mark. It may be that they are turning out a product that they are not particularly proud of or it may be simply a matter of indifference. We know one concern that has spent some money and a lot of thought on the design of an appropriate trade mark and one which would carry not only a message as to the origin of the product but of confidence in the quality. It is a matter that is certainly worth consideration and a problem which every mill will have to meet if we are to get the fullest benefit from the distribution of our pulp and paper. It will mean then that each package is a salesman and considered in that light it is just as important that the package carry a trade mark as that a salesman carry and present his card.

A GOVERNMENT RAILWAY GIVING GOOD SERVICE.

At this time when so much is heard of the general inefficiency of Government operated services, an opportunity for complimenting such organizations should be improved. Last week the editor had occasion to travel Iroquois Falls by way of the Grand Trunk to Toronto, the T. and N. O. to Iroquois Falls and back by the same road to North Bay and then by the Old Canadian Northern to Ottawa and home from there by Grand Trunk. The return was made on the Continental Limited and anyone who thinks the Government cannot give as good service as will be found anywhere, has a surprise in store by taking a trip on this excellent train. For easy, comfortable riding, accurate schedule and general courtesy and thoughtfulness of the service, there is really nothing left to be desired.

BUYING CANADIAN PULP IN THE UNITED STATES FOR CANADA.

A curious situation is coming to light with regard to the purchase of pulp from certain Canadian mills for Canadian consumption. It appears that some manufacturers have offices on the other side of the line and an order for pulp must go through that office, and, to add insult to injury, payment is demanded in American funds. This is certainly a very curious arrangement and a policy which we should call shortsighted to say the least. At a time when it is urged with good reason that Canadian mills should quote in Canadian dollars in foreign markets, it seems almost unbelievably ridiculous for a Canadian mill to ask its neighbor to go to New York or some other American city for its own product. We should hardly call that the acme of co-operation.

The experience of the past summer has shown the futility of trying to fight a fire that has gained headway. Slash debris adds to the hazard of fire and the difficulty of getting at and fighting it. The rebate on stumpage the Quebec government is making to encourage employment in the woods will pay for slash disposal.

Now is the time to begin.

A Trip to La Loutre---The Gouin Dam.

Seldom has the editor more greatly enjoyed a few days respite from work at the desk, than was the case a few weeks ago when, in company with Mr. F. J. D. Barnjum of Annapolis Royal, N.S. and a few other friends, a trip was made to the Gouin Dam at La Loutre on the St. Maurice River. Few people realize the enormous importance of the potential influence of this dam on the industrial possibilities of the Province. But this is getting a little ahead of our story and will be referred to again later on.

Things often happen quickly. In this case a telegram from St. Johns asked for an immediate reply as to whether the editor could join the party the next day in Quebec ready for a trip to the woods. An affirmative reply was dispatched in a very few minutes. Leaving Montreal on Friday morning, the afternoon, was spent visiting the Quebec Industrial and Agricultural Exposition where a surprising variety of products of the industry of the Province were shown. It seemed however, that more attention might have been given to the Pulp and Paper Industry, and with the exception of the success of the Brompton Pulp and Paper Company in their carrying away prizes with their Belgian and Clydesdale horses, the pulp and



Venetian Methods adopted by Indians.

paper companies were not in evidence. It might be worth while for the Association to consider the preparation of an educational exhibit which could be shown on such occasions in order to acquaint the thousands of spectators with the importance of the principal features of our industry.

Leaving on the evening train of the National Railways on which an excellent dinner was served, we were able to get a few winks of sleep before being deposited at two in the morning at the wrong station. Our tickets read to Manouan where the local engineer of the Streams Commission is located, but as Manouan is a flag station and Sanmaur, the next preceeding station is a regular stop, the colored gentleman removed our baggage and assisted us to alight at the wrong place. The porter gave the signal for the train to stop and pick us aboard again but no attention was paid to it and the train rumbled on. With the aid of a flash light, we made our way up the track towards Manouan station which fortunately was but three quarters of a mile distant and as it was no longer raining, the journey was not as unpleasant as it might have been. It cannot be said however, that we entertained particularly friendly feelings for the conductor and engineer of that train.

It might be remarked that we met a stranger, while waiting at Manouan for the train home, who had been served with about the same treatment as ourselves by the train crew, only in his case, instead of being put off at Sanmaur, he was carried past Manouan and dropped in the middle of the night in the middle of the



Old Hudson Bay Post at Weymontachigue.

woods and was incorrectly advised that his station was still further along the line. We trust that this kind of treatment is not typical of the usual service to be expected from the Government railways but such incidents certainly do not improve the reputation of the road nor the desire of people to patronize it. While commenting on the railway, it might be suggested that a buffet service between Montreal and Hervey Junction would be greatly appreciated by travellers and ought to be a paying proposition.

Mr. L. M. Mathis of the Quebec Streams Commission had been expecting us and was good enough to come down the track with a lantern and escort the party to his house where a cordial reception and most hospitable entertainment was accorded us. It is a very important although probably little appreciated asset of a Government department to have such generous and good hearted people in their employ and we wish to emphasize the kindness of both Mr. and Mrs. Mathis



An Indian Family in their Canvas Home.

in the trouble they took to make our visit pleasant and worth while.

A friend of Mr. Mathis, Mr. Angus Hodgson of Montreal, who is known to a good many pulp and paper men went up on the same train to spend a few days hunting and in the morning two of us went along with



Full Blooded Indian Building Log House.

Mr. Hodgson and his guide when our host took them part way up the Manouan River to start him on his journey. This was on Saturday morning. On Saturday afternoon we all went over to the Indian Settlement at the Hudson Bay Post and some of the sights we saw are shown in the accompanying pictures. Perhaps the most interesting was the method of conveying a hay stack from the meadows several miles up the Manouan River. A raft was made by constructing a platform across two canoes and towing this with its burden of hay by means of a motor boat. The operation seemed to be very successful. The Hudson Bay Post is considerably more than 100 years old and the old headquarters are shown in one of the pictures. Quite a number of Indians make their headquarters at the post but most of them at the time of our visit had left for the fall hunting. While there are a number of substantial wooden houses, some of them very comfortable and attractive, there are also a number of tents in which the families live the year round. The idea of a canvas wall for shelter with the thermometer 50 below, did not appeal to us as the height of comfort but the Aborigines seem to thrive on their mode of living if plump and cheerful children is any indication. There is a Catholic Church at the Post, apparently large enough to accommodate the entire settlement and services are held periodically. The Indians make excellent bark baskets and some mocassins which are disposed of through the store at the post and the store at Manouan. There seemed to be almost no gardening at the Indian village.



From the Papoose up.

Through the courtesy of the Brown Corporation, a special trip was made up the river on Sunday. It is about fifty miles from Sanmaur to the dam. The first thirty miles are covered by an excellent motor driven scow which has a capacity of about 7 tons of freight. The cargo space was pretty well taken up with stores for the Brown Company's camp and the canoes and luggage of Indians going up the river. The start was made about 9 o'clock and the journey up this swift flowing stream was a most interesting experience. Both sides of the river had been logged off for saw timber and pulpwood and after repeated fires, contain now practically nothing but hardwood growth, although there are evidences in patches of a struggling undergrowth of young conifers. Here and there we could see dead spruce and fir, victims of the bud worm, and there was an occasional Jack Pine which was being attacked by an enemy unrecognized by us. Quite a number of trees have been blown down, particularly in places where there is only from 6″ to 1 foot of soil covering the ledges. This shallowness of soil makes it particularly imperative that logging operations along



Unloading Works at Rail Head.

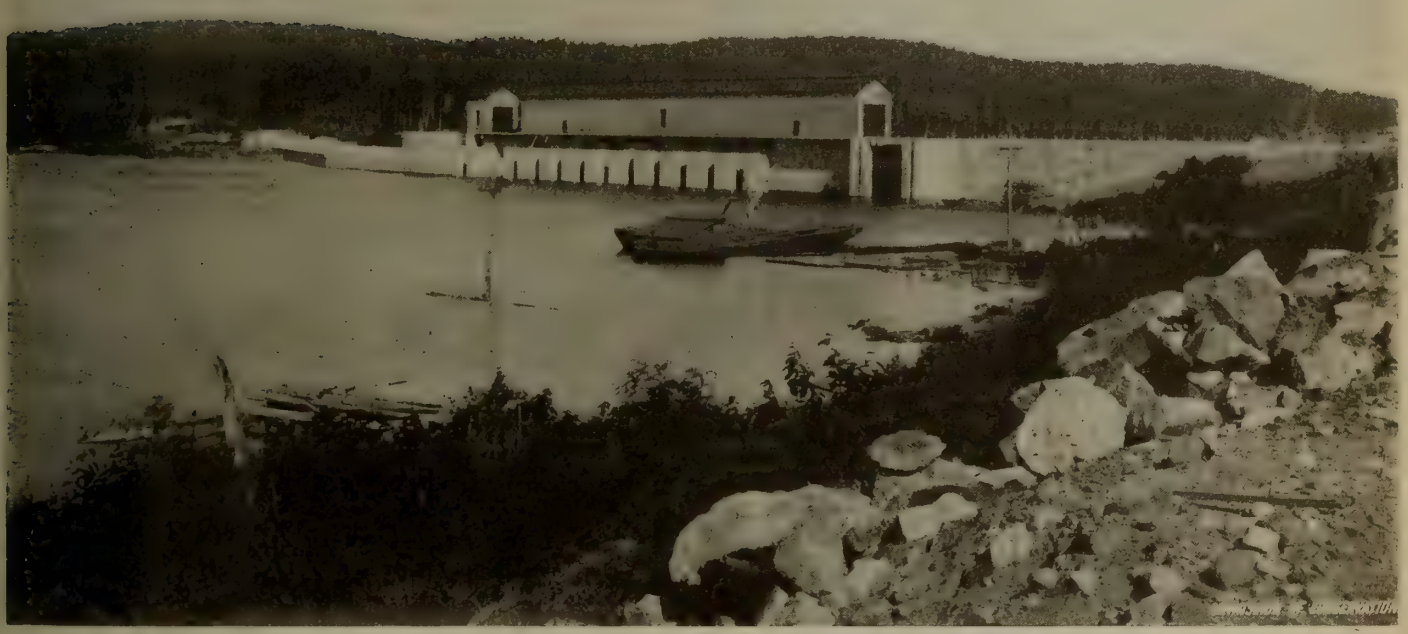
our Canadian streams be carried on with the utmost care in order that the ground shall not be laid bare and thus exposed to the sure and certain erosion that will follow and wash the ledges completely bare.

Several rather swift rapids had to be negotiated and at one place we found an Indian family awaiting the approach of the boat and signalling to be taken aboard. When this had been accomplished, our journey was resumed and the Indians landed further up the river, where a camp site had been picked out and some of their luggage previously deposited. This family furnished a rather novel bit of entertainment in the ability of a young brave of about 3 or 4 years of age who exhibited considerable ability as a dancer and showed a clever little step which none of us were able to imitate. The nickels he gathered in have probably since bought him some allday suckers or perhaps some bright trinket to store away in his pocket. We should also mention that on the boat was the owner and driver of the dog team that won the big race at Berlin, N.H. last winter.

The landing was reached about three in the afternoon and there we found the woods trolley waiting. The huge derricks used for unloading the tons of supplies required for building the dam were not required to get us ashore. We were soon on our way in the

novel conveyance shown in one of our pictures along the 20 miles of rail to the dam. We travelled in a Ford truck fitted with flanged wheels and capable of making about 12 miles an hour. For heavier goods there is a huge Knight car which is equipped with a trailer. This was used for transporting the Indians and their supplies. It should be stated that there is an arrangement between the Brown Corporation and the Quebec Streams Commission whereby members of the latter and their guests are transported over this route without charge, an arrangement and a convenience which was greatly appreciated by our party.

We have not yet seen the famous Toonerville trolley credited with some events related and witnessed on our trip. The skipper who guided the car and who is also in charge of the Brown Corporation's fleet of scows and tugs, told of chasing a moose for more than a mile along the track without being able to overtake



The Big Dam, up-river side, showing gate house and sluice house.

him except to get a blurred snap shot with the camera. We noticed under the seat of the conveyance, crow bars, axes, jackscrews, etc., for replacing the car on the track as de-railing is by no means an infrequent occurrence. The wonder is in some places why the car stays on the track at all. A close approach however, to the roughness of the journey can be had by travelling by trolley in Canada's second largest city over certain parts of the lines.

On arrival at the dam about five we found it a very interesting place. There was time before supper to inspect the dam and the gate house and to have Mr. Mathis explain the purpose of the structure and the operation of the gates. The dam is 1,700 feet wide and 80 feet from the bed of the river below the dam to the water level behind it. A sluice way permits the passage of logs, without damaging the ends, from the lake to the river below. A counterpoise and a system of gears and suspension chains makes it possible to raise and lower the mouth of the chute according to the water level in the lake. A provision is made in the dam for a second log chute if this is necessary, on the opposite side of the dam from the one now installed. When the gates were closed the water began backing up in the valley but the basin was not filled to the overflow level of the dam for two years, during which time the water backed up approximately a distance of 140 miles, thus forming the greatest volume of artificially stored water anywhere in the world. By the opening of the gates any volume of water that may be required can be passed through and at the time we were there two gates were partly open so that water at the rate of 5,000 cu. ft. per second was permitted to escape from the lake. In order to furnish additional water because of the dry season this year, the level in the lake dropped about 18″. If the gates were all opened wide, the rush of water would cause a flood in the valley equivalent to a cloud burst. Even with normal freshets in the spring the river level rises from 5 to 7 feet. The danger of flood is therefore, enormously minimised by the presence of this great mass of concrete which holds back such a vast volume of water. A portable motor, with belt connection to the gate adjusting gears, serves for the raising and lowering of these great steel plates which close the openings in the dam. In addition to these gates, there are recesses for two sets of stop logs in the upper face of the dam. Sometime ago, the editor saw a complete series of photographs which showed the progress of construction as it was carried forward by the contractors, Fraser Brace and Co., of Montreal.

The significance of the dam in the development of the industries of Quebec is but little understood and very imperfectly appreciated by those who have not



Looking South from Indian Village, showing Transcontinental Bridge over the Mannan River near its Junction with the St. Maurice.

come directly in contact with its benefits. The experience of the present summer is but an intimation of the wonderful possibilities of this great project and furnished proof of the foresight of those in the Provincial Government in undertaking this enormous piece of work. We understand that the agreement of the Quebec Streams Commission with the Power Companies at Shawinigan Falls, is that the flow of the St. Maurice River shall be maintained at a minimum rate of 12,000 cu. ft. per second. It was mentioned above that at the time of our visit, the gates were open to permit the escape of 5000 cu. ft. per second This means that the natural flow at Shawinigan Falls would have been only 7000 or 8000 feet per second if the normal volume of the river were available; thus the power output of the hydro-electric stations at that point has been increased this year by practically 70 per cent. Mr. Mathis assured us that a much greater volume of flow could be maintained if required. During some other season possibly a much smaller amount would have to be supplied by the dam to maintain the minimum flow but the rainfall this year has been about as small as it is reasonable to expect. Briefly: 400,000 H. P. is added to the minimum power of the St. Maurice.

While Shawinigan Falls has been mentioned as the criterion for the estimate of stream flow and consequently the calculation of power output, it must be remembered that every power station on the river benefits in the same proportion. It should be remembered also, and this point has not been made sufficiently prominent to the public, that there are probably as great power possibilities yet to be developed as are harnessed on this river and everyone that is established will derive the benefit of the dam. This is now called the Gouin dam in honor of the Premier of Quebec whose foresight was largely responsible for its erection, but which was originally named La Loutre after the name of the rapids at that point of the river.

The time will come when the Trans-Continental Railway will be electrified and the St. Maurice River will probably drive the trains running between Quebec and Montreal and points as far west, possibly, as Amos. The contribution of the enormous water storage reservoir behind the Gouin dam will then begin to be appreciated.

The Streams Commission Engineer has very comfortable offices and quarters and the camp, which is really a little village, has many comforts and conveniences unknown in villages much nearer civilization. It was surprising to find in the heart of the woods a water and sewerage system, bath tubs, electric lights, telephone and even a trolley. The writer is ashamed to record the number of fine trout which he consumed during his stay at the dam, but we would defy any reader to have stopped short of his capacity when confronted with the delicious meals prepared by the camp chef.

On Monday morning Mr. Barnjum and the editor went up into the woods on the ridge back of the dam and measured a few of the trees and stumps to get an idea of the age and the rate of growth. We found a 14 in. and a 9½ in. tree each 140 years old and 13 in. tree 111 years old. A noticeable feature of these trees, which evidently were taken off but a few years ago, was that the rate of growth was fairly rapid and uniform for about 80 years but after that time the annual increment was very slight indeed. In fact, these trees added less than 2 in. in diameter in the last forty years. A measurement of some young growth showed that trees which came up in the shelter of old forest developed very slowly. For instance, a fir 17 years old was only 4 feet in height and a spruce 35 years old was only 6½ feet high and 1½ in. in diameter. The more rapid growth in the early years of the older trees however, will seem to indicate that with the application of proper forestry methods, the St. Maurice valley could be kept in a state of continual production. If however, fire is permitted repeatedly to burn up the young growth as soon as it gets a fair start, there will never again be commercial lumbering along this river or in fact anywhere else in this north country once the original forest is taken off and present methods leave the woods strewn with slash, blow downs and dead timber to invite the first match, cigarette butt, camp fire or lightning bolt to ignite and destroy a township or more.

The start for the return journey was made after lunch on Monday and the twenty mile trip with Capt. Rowell in his flivver was made very interesting by the shooting of several nice fat partridge. The captain's eagle eye spied the birds some distance ahead as they sat on the rails or walked the track and they had not got out of sight before the car was stopped and Mr. Mathis with his one good arm and 28 bore shot gun had blown their heads off. Four partridge with four shots by a one armed man, and that his left, we call pretty good shooting. The editor was especially pleased to be favored with the bag.

The trip down the river was pleasant and uneventful. The next morning at four, we took leave of our hospitable friends and returned to the routine work of getting out a weekly magazine.

In conclusion, if anybody has the notion that Canada's forests are illimitable, or not in every way deserving of minute care **from now on,** he will be converted to a different faith by a trip to what once was woods.



The Woods Trolley—If Henry could see this!

The Structure of Cereal Straws

By FRANCIS E. LLOYD, F.R.S.C. McGill University.

(Continued from last issue.)

COMPARISON OF THE VARIOUS STRAWS BASED UPON STRUCTURAL DIFFERENCES.

External Gross Character.

The four straws under examination may, if entire, be readily distinguished by their stature, thickness, and the shapes of the individual internodes and the minor but nevertheless diagnostic characters offered by the false nodes, by the shape of the upper part of the internode just below the nodes, the sub-nodal constrictions, and claws. The keys given below, as being the briefest methods of description and at the same time most easily usable, present the contrast of structure in summary form. It will be understood that such keys are useful only as descriptive of the four straws included, and would require modification and extension if other straws had to be considered (*). A possible qualification might be forced even by races within the species, and even by the age of the individual. Thus Carrier e.g. bases his classification of grain seedlings on the presence or absence of claws, finding them present

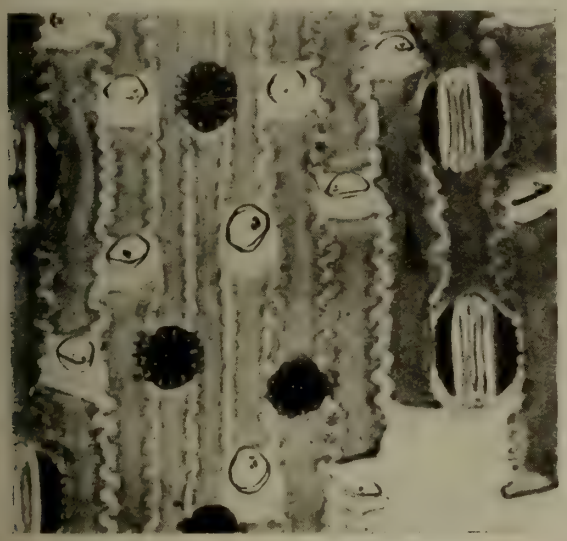


Figure 27. — Epidermis of wheat to show the crown cells. The dwarf cells are also in evidence by the black outlines, due to included air. The cells are somewhat separated from each other by maceration. x 310.

in all the grains but oat. It was difficult to find evidence of claws in the sample of wheat straw supplied for this work, but other samples showed them to be present, but quite irregularly. Thus they may be present on one side only, or totally absent, or, when present, they may show much difference in size on the two sides of the leaf. Rye, in common with wheat, betrays a considerable amount of variation in this respect.

The characters used in the keys are for the most part such as may be detected readily even if the straw is broken, and when the fragments are small. When pulped however, identification must rest upon minute anatomical characters which offer greater difficulties of choice and application. Such characters are the length of fibers, sizes of stomata, the presence or absence of trichomes ("comma cells," Weisner, 1865.) characters of epidermal walls, and the like.

(*) See the bulletin by Lyman Carrier, 1917.

Identification Keys Based Upon External Characters.

Interior face of leaf sheath smooth; ligule long (*ca.* 4 mm.); claws absent; false nodes usually much shorter than broad; terminal internode 2 or more mm. in diameter near tip—oat. Interior face of leaf sheath rough, more or less, with upwardly directed short, stiff trichomes (comma cells); ligules short (1 mm.) Upper part of terminal internode pubescent or hirsute, the internode tapering to slender dimensions (1 mm. diameter)—rye. Upper part of terminal internode smooth thick toward apex. Claws prominent, always present —barley. Claws sometimes absent, small or various in size—wheat.

The dimensions of the false nodes when wet and dry afford a means of identification of some value, though more difficult of application. The following tables are examples of such measurements.

Measurements (diameter and length) of false nodes of barley, oat, rye and wheat in swollen condition, in millimeters.

	Basal		Middle		Top	
	Diam.	Length	Diam.	Length	Diam.	Length
Barley	5	3.5	4.8	4	4.2	5.4
	4.6	4	4.5	5.3	3.7	7
Oats	5.5	2.5	5.5	2.6	5.3	3.2
	4.6	2	4.5	2.7	4	2.6
			5.4	2.8	5	3.5
Rye	4.5	3	4.4	4	3.5	5.2
	4.5	2.5	4.4	4	3.6	4.5
	5.2	3.8	5	4.7	4	4.5
Wheat			4	2	4	4
			4.5	3.5	4.5	3.8

Measurements (diameter and length) of false nodes of barley, oat, rye and wheat, to the nearest half-millimeter, when dry.

	3rd.		2nd.		Top	
	Diam.	Length	Diam.	Length	Diam.	Length
Barley	2.5	3	2.5	4	2	4.5
	2.5	2.5	2.5	3.5	2	4
			3.0	3.5	2.5	4.5
	2.0	2.5	2	3.5	2	4
			2	3.5	2	4.5
Oats			4	1.5	3	2
			4	2	3.5	2
			4	2	3.5	2
			4	2	3	2
			3.5	2	3	3.5
Rye	3	3.5	3	4	2	4
	3.5	2.5	3.5	3	2.5	3.5
	3	2	2.5	3	2	3.5
	4	3.5	3.5	4	3	4
	3.5	3	3	3.5	2.5	4
Wheat			3.5	3	3	3
			3.5	2.5	2.5	3.5
			3	2.5	2.5	3.5
			3	2.5	2	3
			3	3	2.5	3.5

COMPARATVE ANATOMICAL CHARACTERS OF STRAWS.

Comparison of Distribution and Characters of Tissues as Seen in Sections.

1. Transverse section of the terminal internode (figures 16-19). There is little that can be regarded as sufficiently characteristic in the structure as seen in transverse section to serve as diagnostic. Of two rather obvious points, that of size has already been made use of in one of the preceeding keys. It may be added here that the thickness of the wall of the terminal internode near the tip is equally characteristic, and is for the different straws as follows:—

	Thickness of wall	Diameter of straw
Barley	1	6
Oat	1	8
Rye	1	3—4
Wheat	1	4

On this point therefore, rye and wheat may be distinguished from oat and barley.

The second point is found in the number of chlorenchyma spaces which may be counted in the total transverse section. Rye has by far the fewest, namely, about 18 to 20, while the other species have from 30 to 36, barley having 32, wheat 34 to 36, and oat 36 to 38. These numbers are approximately twice the numbers of bundles in the innermost series. The fact that the chlorenchyma spaces may be double instead of in pairs separated by a small bundle may make it necessary to regard a single one as two, or to rely rather on a count of the large bundles which lie free in the parenchyma. Thus, the stem in figure 4 has 37 bundles, which is, however, not a terminal internode.

A third feature is the character of the lining of the fistula formed by the deal parenchyma. It is thickest and pavement-like in the oat (figure 17), well defined in all but the wheat, in which it is loose and ill-defined in texture, not forming a smooth lining.

Summarizing these characters in the form of a key we have the following:—

A. Thickness of wall of fistula (terminal internode, near its apex) one-fourth to one-third the total diameter
  a) Collapsed pith cells forming a clear cut pavement; or
  b) Number of bundles in innermost series about 12 . . . . . rye
  aa) Collapsed pith cells loose, not forming a pavement; or
  bb) Number of bundles in innermost series about 18 . . . . . wheat

B. Thickness of wall of fistula one-sixth to one-eighth that of total diameter.
  a) Pavement formed by pith-cells thick; or
  b) Parenchyma cells large . . . . . oat
  aa) Pavement formed by pith-cells thin; or
  bb) Parenchyma cells one-half the diameter of those in oat . . . . . barley.

The amount and disposition of the fibers (mechanical tissue, bast) is correlated with the chlorenchyma, there being relatively more fibers toward the base of the (top) internode, and relatively fewer toward the apex. In relation, however, to the area of the transverse section the fibrous tissue is greater toward the apex, this being apparently correlated with the mechanical conditions associated with the reduced diameter. Concerning the character of the fibers we shall speak beyond.

2. Transverse section of basal internode. If anything, the lower internodes offer less to seize upon for purposes of identification than the terminal. Bearing in mind the difference of structure as between the upper and nether parts of the internode, the middle portion has been taken as a standard of comparison. Of the four straws, the oat stands out clearly on account of the small number of parenchyma cells, and of their large

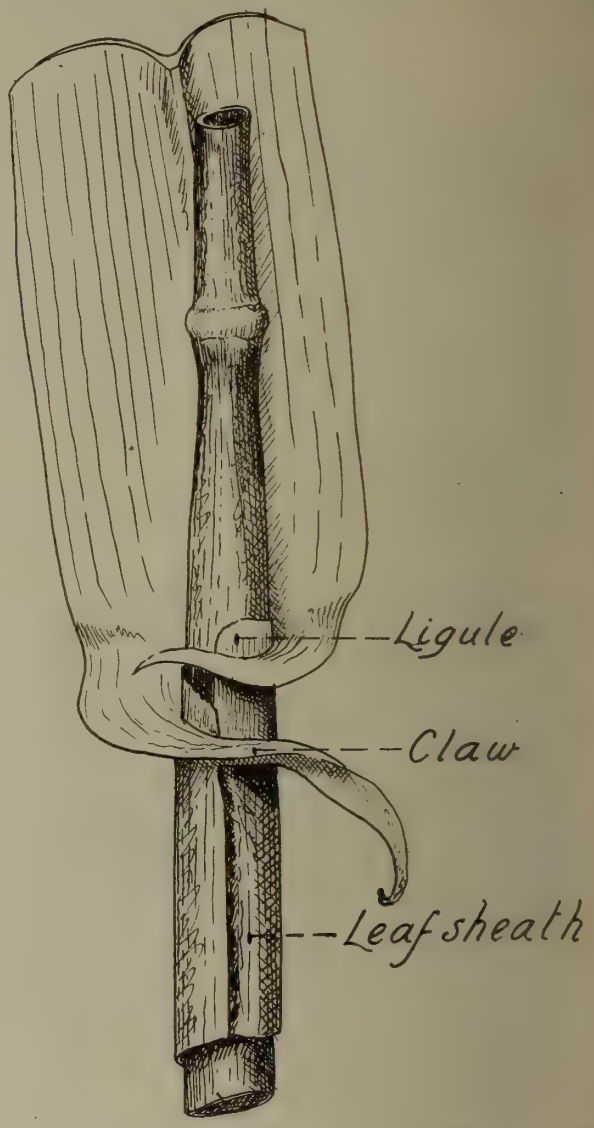


Figure 28. — Barley. Juncture of the leaf sheath and blade. to show the claws and ligule.

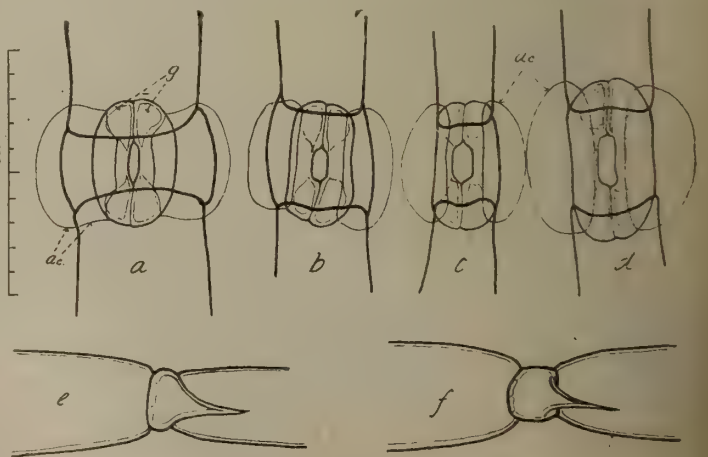


Figure 29.—Stomata and trichomes inner (upper) epidermis of the leaf sheath of (a) barley (b) oat, (c) rye and (d) wheat; also the trichomes of (e) rye and (f) wheat; g., guard cells; ac., outline of accessory cells. Drawn to the accompanying scale

size. As in the terminal internodes, the collapsed pith cells make a thick pavement lining the fistula. In the oat also there are only about 20 large bundles free from the fibre layer, while in the others the number is greater, from 24 (wheat, rye) to 28 (barley).

Comparison of the individual tissues and of their elements. Epidermis (figures 6-13). Of all the tissue systems, the epidermis lends itself most readily to identification, since it is more distinctive of the genus.

Wiesner's (1900) findings are of interest at this point. He says that the bast cells of the four cereal straws (here under consideration) are so similar as to afford no characters for certain differentiation, while the size and form of the epidermal cells are quite distinctive. Those in rye, wheat and oat he continues, have a pretty regular rectangular general outline. Those of rye have strongly sinuous limiting outline, while those of wheat are straight. Oat on the other hand has epidermal cells with a gently wavy outline. Those of barley are rhomboidal or trapezoidal in contour. The writer in view of the facts below presented feels that Wiesner's description is quite inadequate.

Fragments of the epidermis, or at least individual cells are easily found in paper pulp, and since they of all the elements show the least amount of distortion, their characters can be seized upon with corresponding readiness and certainty. Of the individual elements (cells) it is difficult or impossible to find those of stomata and the dwarf cells in bleached papers, since in these the treatment complete dissociates the cells in question, while their small size allows them to be washed away. In unbleached papers, on the other hand, fragments of epidermis sufficiently big to carry all the kinds of cells composing it can be found, thus permitting identification.

The epidermis of the outer surface of the leaf-sheath differs from that of the stem in certain details, and, inasmuch as for constant length of straw there will be more leaf epidermis present in pulp, it is quite as important an element to be considered as the stem epidermis, if not more so. The leaf blades are in minor quantity and are almost negligible in this respect.

As has already been said above, the epidermis is not uniform in structure, but consists of alternate longitudinal zones; those roofing over the chlorenchyma spaces, and recognizable by the stomata (stomatal zones), and those underlaid by fibrous tissues, devoid of stomata (non-porous zones). The latter, except in wheat, do not afford readily differentiable characters. The component cells are straight-walled (except in the leaf of wheat) and narrow, roughly about one-half the transverse diameter of the cells of the stomatal zones. These alternate, in a longitudinal sense, with the minute dwarf cells, which are either single, or in pairs. In the former case the dwarf cell is from the point of view of morphology a trichome of small size. When two are present, the upper (distal) one is a trichome. In the wheat in addition to the dwarf cells, there is a peculiar cell, roughly circular (*ca* 30 microns in diameter) in outline *en face*, and round or quadrangular in the stem, which, on account of the large amount of unmodified cellulose present, take up stains (magenta, Bismarck Brown, safranin, etc.) more readily than the remaining epidermal cells, excepting only the accessory cells of the stomata. By their consequent darker staining reactions, they are more readily seen in suitably stained preparations, as seen in figures 9 and 13, and especially in figure 27. In the leaf they assume the form of trichomes.

On account of their shape I call these cells *'crown' cells*. Since they are absent from the other grains which we are considering, the presence of crown cells definitely identifies wheat.

In barley wheat and rye, trichomes are present. They are especially developed on the terminal internode of rye, and, in fragments of epidermis, their bases are seen as large oval cells in the positions of dwarf cells. Smaller ones sometimes occur on the leaf sheath (outer surface) in wheat.

They are absent from the oat excepting only that they are present on the upper surface of the leaf-blade and its margins. Their form is such that the sharp claw-like end lies for the most part parallel with the leaf-surface and so the roughness produced is not marked. This permits their recognition with some certainty. In the epidermis of the stem and outer (lower or dorsal) surface of the leaf sheath, we note the following:

The cells (exclusive of stomata and dwarf cells) have much more strongly (1) wavy or sinuous longitudinal walls in the leaf-sheath. In the stem they are only slightly undulating, or, in oat, straight, or nearly so. Arranged in series based on waviness both in leaf-sheath and stem the four straws are as follows: Wheat=rye; barley; oat.

It is difficult to judge on this point as between wheat and rye, since the walls are thinner in the latter and so the waviness is masked. The waviness is most irregular in wheat and least so in oat, the four straws falling, as regards this feature, in the same order as the above.

The waviness and irregularity in the wheat are very characteristic, and enable one to identify it with considerable ease. The oat is equally distinctive by virtue of the relative or entire absence of undulations from the cell walls of the middle of the stomatal zones of the upper region of the leaf-sheath (3) the sinuosities increasing in amplitude toward the non-porous zones and toward the base of the sheath. When isolated, the straight walled cells are indistinguishable from the epidermal cells from the inner (upper) surface of the leaf-sheath and from the outer surface of the papery leaf margin, so that, unless leaf-fragments of sufficient size are available, positive evidence can be gained only from the sinuous cell-walls. The character of these sinuosities is well shown in figure 11, which however is from a part of the leaf sheath which does not show the straight cell walls, that is, approximately, the middle region.

Rye and barley can be distinguished readily enough from wheat or oat, but not easily as between themselves, if the character of the undulations is depended upon (figures 11, 13). They are however easily separable by the absence or presence of trichomes at least as far as the lower part of the leaf-sheath is concerned and by the character of their walls, which are much thicker generally in the wheat.

The character of the undulations is more difficult to judge when the cells are isolated, since the lateral processes of the cell, corresponding to the undulations but lying below the surface, are much more pronounced. It is therefore necessary to obtain a microscopic image of the outline of the upper face of the outer cell wall, (see figure 14) that namely to which the cuticle is applied.

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(1) That is as to depth, but not as to the number of undulations per unit of length.

(3) Wiesner's description of the epidermal cells of oat has already been cited. It is evident that he had regard only to the epidermis of the stem. The waviness of the walls of the leaf-sheath epidermis is so evident, and it is so certain that the leaf-sheath contributes largely to the fiber in paper that it is quite necessary to

have regard to the character of its epidermal cells.

An effort has been made to base distinctions upon the thickness of the epidermis cell walls, but this is difficult. The thickness varies with the level, the extreme thickness being found at the base (6 microns for oat), where the amount of fiber is also greatest, and the least thickness (2 microns for oat) just below the ligule. This character varies also with the maturity of the plant. In general however, the series seems to be the following, in order of thickness of cell wall.

ITALY'S PULP AND PAPER IMPORTS.

From the Anglo-Italian Review for September, 1921.

Ever since 1919 paper intended for newspaper has been exempted from Italian import duty. The period of exemption has been lengthened from time to time and a recent law has again granted exemption up to the 1st December 1921.

Were it not for this exemption the import duty would be L. 12.00 per quintal.

In regard to the paper imports into Italy, the following details are worthy of study:

Imports in Metric Tons (2204.6 lb.) during	1913	1920	1921
Rags, chiefly from France, 2,158 T in 1920, Hungary 725 T, Switzerland 667 T, Tripoli 236 T, but only 23 tons from the United Kingdom	7,400	5,950	950
Pulp and Cellulose (dry weight) chiefly from Sweden, 39,500 T in 1920, Norway 9,300 T, Austria 7,155 T, Czecho-Slovakia 3,600 T, whilst in 1921 Austria takes first place, 4,000 T in 3 months, followed by Sweden 3,400 T and Germany 3,200 T	95,950	70,000	12,600
Plain paper chiefly from Austria 3,000 T in 1920, Germany 3,000 T, Switzerland 1,200 T, Czecho-Slovakia 1,000 T, United States 600 T, whilst for 3 months of 1921 Germany stands first with 3,600 T, Austria 1,600 T and the United States 420 T.	3,600	9,900	6,600

The points of interest to our merchants are the absence of Canada from this list of countries that sell pulp and cellulose to Italy and the great increase during 1921 of the Italian demand for manufactured paper. During the first quarter of 1921 Italy imported much less than one-quarter of the 1920 whole-year imports of the raw materials for paper, but she imported two-thirds of the quantity of paper which she had imported during the preceding twelve months. The present would seem, therefore, to be a favorable moment for offering British pulp from Canada to the Italian paper makers. The local production of mechanical pulp (chiefly poplar) is only about 10,000 T short of the local requirements, but Italy is backward as regards the home production of cellulose.

The customs duty on pulp and paper, other than paper for the press, is, per quintal (220.4 lbs): Wet pulp, containing at least 50 per cent water, L. 1.00, dry pulp, L. 2.00, cellulose, L. 2.00. Paper, white or dyed in the pulp, and not sized: not ruled, L. 18.75, ruled, L. 22.75, envelopes L. 33.75. Paper, white or dyed in the pulp, sized, L. 42.00.

A point of interest to our own makers of high-class paper who use Tripoli esparto grass as their raw material, arises from the closure of the Government Special War Department for the supply of paper to the daily press. This department made a profit, which is being spent on setting up experimental esparto pulp machinery.

Imported during the Year 1920 and the First Quarter Of 1921 (Amounts in Metric Tons Except Where Otherwise Indicated)

Amounts Imported From	All Countries.	British Empire.
Rags (except wool)	6,900	152
Pulp, cellulose	82,907	x
Paper, not ruled	16,500	201
Paper colored, gilt painted	619	82
Wall Paper	561	105
Photographic Paper	500	134
Cardboard: Ordinary	13,534	269
Glazed	796	51
Fine	500	87
Prints, Lithographs, Show Cards	589	68
Paper and Cardboard Goods	414	38
Books	194	46

x The volume of trade with the British Empire is small, therefore figures are not published separately.

CORRESPONDENCE.

17th September, 1921.

Editor Pulp and Paper Magazine,
Gardenvale, Quebec.

Dear Sir,—I was interested in the discussion of Long Prices in your Sept. 15th number, partly because I have had so little experience with anything that might be considered a short price.

An experience of my own came to mind when I saw something about printers making a profit on paper used in their work.

The last lot of letter heads, on one of which this letter is written, were billed to me at $18.20 a thousand.

When I recovered my breath I asked if there had been any mistake, and this is what came back,—

"Replying to your enquiry regarding our charges for your recent order of letterheads would say that the cost of stock was $9.81 plus a 1 per cent tax. When you add to this the cost of printing the order of $4.00 we think our charge of $18.20 is quite fair."

Now his overhead was taken care of in the $4.00 because that was what he quoted me to print from die if I supplied the paper, so he made $4.30 on ordering and trimming the paper.

My paper cost me $14.20 and as it is 20 lb. stuff that was $1.42 a pound, which is I should say a very long price, pretty near the elastic limit.

Yours very truly
"The Short of It."

The new motion picture service of the American Paper and Pulp Association had its first try-out recently in Margaret, Ala., a small mining town. The purpose of the service is to distribute films on the paper industry.

A Contribution to the Study of Rosin Size.*

Translated by JESSIE E. MINOR, Emerson Laboratory, Springfield, Mass.

The following notes are the result of several years of study of the subject of paper sizing both in the mill and in the laboratory. While the experimental results are very interesting, the data given is insufficient to establish or dispute the theories suggested. More experimental work is needed before the subject can receive discussion.

For the sizing of paper there is need of a rosin solution containing at least a part of the rosin in a free state. This may have been left free in the making of the soap or may be the result of the hydrolysis of the sodium resinate when the size is diluted to a milk. From the standpoint of colloidal chemistry, size milk may be considered as a fine suspension of free particles of rosin. Suspensions of this kind are very sensitive to the addition of electrolytes which change the suspension to a two phase system of precipitate and watery liquid, but the details of this process, with reference to rosin size, have not been studied.

In the following experiments pure rosin solutions were used instead of the usual size milk. While the conditions in the two cases are not exactly the same, yet conclusions obtained with the use of a solution of pure rosin may lead to an explanation of the phenomena associated with rosin size solutions.

The first point of interest is the effect of an aluminium sulphate solution upon a free rosin suspension, since this electrolyte and related salts are used exclusively in practice for the precipitation of size milk. In order to study this, the following experiments were carried out: The solutions used were chemically pure aluminium sulphate of definite concentration and a free rosin suspension made by dissolving pure colophony in alcohol and then pouring the solution in a thin stream from a pipette into distilled water. This solution was allowed to stand for 24 hours in order to give the larger particles time to settle. 20 cc portions of this rosin suspension were then put into large beakers and mixed with decreasing amounts of aluminium sulphate solution, in each case maintaining the same volume of liquid. For example, the first beaker contained 20 cc of rosin solution and 20 cc of aluminium sulphate solution, the second beaker contained the same amount of rosin but 10 cc of aluminium sulphate and 10 cc of distilled water, etc. The beakers were covered and allowed to stand for 2 hours at 20°C. From results shown in table I it is apparent that limiting values occur beyond which no precipitation occurs. The lower value is 0.08 millimols, the upper about 0.6 millimols of aluminium sulphate in one liter. In the zone which lies between the two limiting values, precipitation begins during 24 hours and is complete after 36 hours. On the other hand, in the flocculating zone whether upper or lower, precipitation occurs quickly and evenly.

This phenomenon is not limited to any special rosin but can be observed in widely different kinds. Mastic gum, which was studied by Neisser and Friedemann, acts similarly.

This phenomenon may be explained as follows: Free rosin suspension forms a negatively charged colloidal solution, but this charge is discharged by the addition of an electrolyte resulting in coagulation and precipitation. In the lower precipitation zone the charging or discharging of the disperse phase is brought about by the absorption of positively charged aluminium hydroxide which exists in the electrolyte solution as a result of hydrolytic splitting. If sufficient aluminium hydroxide is present, the rosin particles may be completely covered over with a layer of positive aluminium is a positive solution. If now more of the electrolyte is added so that the adsorption of sulphate ions occurs, coagulation again results and we hae the upper precipitation zone.

From these considerations it is apparent that the limiting value is that amount of electrolyte which just removes the charge from the particles in suspension.

Analyses of these precipitates show that for the upper zone both aluminium hydroxide and sulphates are present, but while the aluminium hydroxide content is measurable, amount to from 0.008 to 0.012 per cent, that of sulphate is only a trace. These precipitates are different in appearance from those obtained from size milk, the latter being much more granular in structure.

Table II.

Concentration Millimols of $Al_2(SO_4)_3$ per liter.	Behavior of the Rosin in the Suspension.	Remarks.
20.90	Complete prec.	Upper prec. zone.
10.45	" "	
5.32	" "	
2.61	" "	
1.31	Slight "	
0.653	Very slight "	
0.327	No "	Upper non-prec. zone.
0.163	" "	
0.082	Complete "	Lower prec. zone.
0.041	Slight "	
0.020	No "	Lower non-prec. zone.
0.010	" "	
0.005	" "	

Calculating from these solutions, in order to effect precipitation in the upper zone when using pure rosin solution, there would be needed for 100 grams of pulp 2 grams of rosin and 0.66 grams of alum which is more alum than is required for a rosin milk with 40 per cent free rosin. With the accepted acid number of 11.8, only 0.19 grams of alum are required for the precipitation of 2 grams of rosin.

There is in the literature considerable data as to the effect of other electrolytes upon rosin solution and this would be interesting for comparison. From the valence rule, which apparently does not apply in some cases at all and is only an approximation in the remaining cases, the ability of an ion to precipitate a colloid in suspension depends upon its valence. The larger the valence, the less of it is needed to precipitate the colloid. For a negative colloid, it is the valence of the cation, for a positive colloid that of the anion which is determinative. Since the above mentioned rosin

* The original of this article, by Dr. Rudolf Sieber, Kramsfors, appeared in the April, 1921, number of Zellstoff u. Papier.

suspension carries only negative charges, its behaviour can easily be predicted.

In table II are given the observed limits for different electrolytes. The experiments were carried out in the same way as were those with aluminium sulphate described above.

Table I.

Electrolyte.	Precipitation value in millimols per liter.	Remarks.
NaCl	1100	
KCl	1200	
$CaCl_2$	27	
$CaSO_4$	10	Incomplete.
$BaCl_2$	22	
$MgSO_4$	15	
$FeCl_3$	0.04)	
$Al_2(SO_4)_3$	)	Lower zone.
2	0.04)	

From table II it is apparent that the trivalent ions (Fe, Al,) are stronger than the monovalent ones.

In table III are recorded the results of the varying concentrations of ferric chloride upon rosin size under the same conditions as were used for the work recorded in table I.

Table III.

Concentration Millimols of $FeCl_3$ per liter	Behavious of the Rosin in the Suspension.	Remarks.
50.00	Complete prec.	Upper prec. zone.
25.00	Almost complete prec.	
12.50	No prec.	Upper non-prec. zone.
6.25	" "	
3.12	" "	
1.56	" "	
0.780	" "	
0.390	" "	
0.195	" "	
0.098	Very little prec.	Lower prec. zone.
0.044	Complete prec.	
0.022	No prec.	Lower non-prec. zone.
0.011	" "	

The differences between the series of Tables I and II are not great and both salts approximately follow the valence rule. The precipitation in the lower zone is brought about by the positive hydroxide, which explains why the lower limiting value occurs at about equivalent concentrations, i.e., 0.041 millimols of $Al_2(SO_4)_3$ and 0.044 millimols of $FeCl_3$. For precipitation in the upper zone it is the anion which is effective and the divalent sulphate ion is stronger than the monovalent chloride ion, the former reaching its limiting value at 1.03 millimols, the latter at 25.00 millimols.

The rate of precipitation increases rapidly with the temperature, as can be seen from Table IV.

Table IV.

Electrolyte	Time in Minutes for Complete Precipitation at 18°C	28°C	35°C	40°C
NaCl	120	40	30	30
$MgSO_4$	120	30	20	20
$CaSO$	190	40	30	30
$Al_2(SO_4)_3$	100	20	20	15
$FeCl_3$	90	20	20	15
Average time required	124	50	24	22

The greatest change in the velocity seems to occur between 20° and 35°C. An examination of the precipitate in each case showed that both cations and anions were present.

A few experiments were carried out to determine the effect of the addition of several electrolytes at the same time. The effect of the simultaneous addition of several electrolytes to the same suspension was found to be not additive and the total effect is less than the sum of the separate effects. It is interesting to note that hard water can cause coagulation without the amount of any one salt overreaching the limiting value. From the above Table it may be noted that calcium salts cause precipitation at a concentration of approximately 25 millimols to a liter and the corresponding value for magnesium salts is about 15 millimols per liter. These figures would correspond to a German hardness of about 140 or 84° (1° of German hardness is due to the presence of gram or 17.8 millimols of CaO in 100 liters of water.) It is, therefore, apparent that a pure rosin suspension is stable to a very hard water.

In conclusion it might be said that the use of a free rosin suspension, with reference to the amount of alum required for precipitation is not more favorable than is the rosin size which is now used, but that with reference to precipitation through hardness of water it would be very much safer.

GENERAL CHEMICALS.

Current Wholesale Prices in New York Market, Week of October 5, 1921.

		Carlots	Less Carlots
ACID, Acetic 56%	100 lbs.	5.50-5.75	6.00-6.50
" Glacial 99½% carboys	100 lbs.	10.50-11.00	11.25-10.50
" Hydrochloric	100 lbs.	1.25-1.50	1.60-1.75
" Sulphuric, 66% carboys	ton	....-....	....-....
" Sulphuric, 66% drums	ton	21.00-22.00	22.50-23.00
ALCOHOL, Ethyl	gal.	....-....	4.65-4.90
" denatured 188 proof	gal.	....-....	.35-.36
ALUMINIUM Sulphate, commerc.	lb.	.02-.02¼	.02¼-.02¾
" sulphate, iron free	lb.	.03-.03¼	.03½-.04
AMMONIUM Chloride, granular, white salamoniac, normal)	lb.	.06-.06½	.06¾-.07
AMMONIUM Chloride, granular (gray salamoniac)	lb.	.06¾-.07	.07¼-.08
BARIUM SULPHATE (precip.) (blanc fixe)	lb.	.04-.04¼	.04½-.05
BLEACHING POWDER (see (Calc. hypochlorite)			
CALCIUM hypochlorite (Bleaching Powder)	100 lbs.	2.75-2.80	2.90-3.50
CAUSTIC SODA (see Sodium hydroxide)			
CHLORINE, gas, liquid cylinders	100 lbs.	.08-.09	.09½-.10
GLYCERINE, C.P., drums extra	lb.	....-....	.14½-.15
LITHARGE	lb.	.07½-.08	.08¼-.09
SALT cake	ton	....-....	20.00-25.00
SODA ASH, light	100 lbs.	2.10-2.15	2.20-2.50
" " dense	100 lbs.	2.35-2.40	2.45-2.70
SODIUM Borate (Borax)	lb.	.05½-.06	.06½-.07
" Carbonate (Sal Soda)	100 lbs.	1.90-2.00	2.10-2.40
" hydroxide (Caustic Soda)	"	4.00-4.10	4.15-4.75
SULPHUR, Crude	ton	18.00-20.00	....-....
" Dioxide, liquid, (cylinders extra)	lb.	.08-.08½	.09-.10

In the New York Chemical market, several of those close to the pulse of trading believe that the last quarter will prove to be the brightest of the year, and that the improvement in business will be gradual until after New Year's, when it will be brought to its former normal state.

There has been very little heard of imported soda ash during the past few weeks. A stiffening market in cyanide of soda, prussiate of soda and soda ash has been the principal factor in the week's activities. There has been a marked shortage of supplies on the two latter items, especially from importers.

There have been reductions made by manufacturers of sulphuric and nitric acids.

British Trade News

(Special from our London Correspondent.)

London, Sept. 27th, 1921.

"Shocking!" This simple word—though with a dreadful meaning—sums up the state of trade in paper and pulp circles in the United Kingdom. People say there is a good outlook at times and things cannot last as they are going at present; but the fact remains business is in a "topsy-turvy" condition and the rates of exchange, amongst other elements, are blamed for trade's discord. This is not new history; it is old. As far back as April 1st, Mr. Stanley Cousins, who wrote a sensible and business-like letter to the London "Times", warned the Government and the paper makers that depreciated currencies were responsible and would be responsible for bad trade unemployment, and cheap dumped goods in England, and it is only today the Government in "tackling" the unemployed question have laid the root of all evils on the predictions of Mr. Cousins. Readers of the "Pulp and Paper Magazine" will recollect that I gave considerable attention to the dictum laid down by Mr. Cousins in April and one may ask where are his opponents to-day, who at the time told him, practically, that he was talking nonsense. Depreciated currencies undoubtedly prevail, British pulp and paper are down in exports and imports, unemployment is startling and now we have set up a committee under the Safe-Guarding Industries Act ("Key" industries Act) before which papermakers will have the opportunity of applying for protection—as advocated by Mr. Cousins in April last. The more one looks into the present economic and industrial position the greater become the problems. Therefore, I have selected the name of Stanley Cousins as a theme, because, as far back as March last he predicted what was to be expected. We are now in the midst of the trouble and the only recompense is to fly to the Board of Trade and see what their figures show as a barometer of trade past and present.

The Pulp Imports For August.

The latest figures are for August. All kinds of pulp was imported to the extent of 101,689 tons, compared with 55,971 tons in July—due largely to large shipments from Sweden—but the figures for the 8 months, January to August, are poor reading as they show only 336,252 tons compared with 742,324 tons for the same period in 1920—less than one half. These returns tell a story; they relate the facts that the British mills are not making their full supplies of papers and that "all is not well" with them in this trying post-war period. Turning to the countries of supply an eight months comparison is interesting for 1921 and 1920:

Groundwood: From Sweden, 5,138 tons (60,824 tons in 1920); Norway, 120,305 tons, (223,248 tons); Canada, 58,560 tons, (47,193 tons); other places, 6,342 tons (12,489 tons)—a total of 190,345 tons, as against 343,754 tons in 1920. The increase in the Dominion figures should be noted and, if possible, maintained.

Unbleached Chemical (Dry): From Finland, 3,564 tons, (30,915 tons in 1920); Sweden, 91,955 tons (220,288 tons); Norway, 26,416 tons (67,329 tons); Germany, 4,604 tons (4,200 tons); other places, 6,843 tons (26,606 tons)—a total of 133,382 tons as against 349,338 tons in 1920.

Bleached Chemical (Dry): From Finland, 51 tons (nil in 1920); Sweden, 1,190 tons (2,919 tons); Norway, 6,967 tons (11,464 tons); Germany, 140 tons (505 tons); other places, 895 tons (5,185 tons)—a total of 9,243 tons as against 20,073 tons in 1920.

Taking all raw materials into account, rags, esparto and pulp, the total for the eight months reached 391,664 tons, as against 879,061 tons for the same period in 1920. This falling-off is a very serious matter and is indicative of the trade passing.

Exports of Papers.

The exports of paper, boards, bags, playing cards, etc., for August are below those of July—a month that was hampered by the coal crisis. August figures are 84,957 cwts (932,180 cwts for the eight months as against 1,377,821 cwts in 1920) and for July 94,616. The countries exported to during January to August were as follows:

Printings: To France, 5,855 cwts (58,594 cwts in 1920); U.S.A., 5,496 cwts (4,456 cwts); other foreign places, 88,508 cwts (170,933 cwts); South Africa, 51,005 cwts, (40,550 cwts); India, 67,312 cwts (154,824 cwts); Straits Settlements, 7,080 cwts (8,002 cwts); Ceylon, 9,983 cwts (13,146 cwts); Australia 194,141 cwts, (60,331 cwts); New Zealand 32,470 cwts (19,212 cwts); Canada 1,855 cwts (1,119 cwts); other British Possessions 23,705 cwts (36,883 cwts). Total 487,410 cwts, as against 568,030 cwts in 1920. The increased supplies to Canada should be noted.

Writing paper: To France, 1,312 cwts (17,752 cwts in 1920); U.S.A. 591 cwts (766 cwts); other foreign places 16,158 cwts (25,908 cwts); South Africa, 5,159 cwts (4,909 cwts); India, 20,508 cwts (40,194 cwts); Straits Settlements 2,160 cwts (3,391 cwts); Ceylon, 1,086 cwts (2,546 cwts); Australia 22,804 cwts (25,476 cwts); New Zealand 10,293 cwts (7,330 cwts); Canada 894 cwts (411 cwts) other British possessions, 6,015 cwts (7,675 cwts). A total of 86,980 cwts as against 136,358 cwts in 1920.

In August packing and wrapping paper was shipped to the extent of 10,280 cwts and in July 11,243 cwts. Tissues are down to the lowest ebb.

Imports of Paper.

The imports of paper for August were 696,303 cwts compared with 522,724 cwts in July. For the eight months they are about one-third those of 1920. The principal imports are for the eight months:—

Printing paper: From Sweden, 362,486 cwts (321,985 for 1920); Norway, 156,437 cwts (446,066 cwts); Germany, 40,545 cwts, (84,505 cwts); Belgium 52,506 cwts (11,880 cwts); U.S.A. 5,064 cwts (54,504 cwts); Canada, 5,203 cwts (130,126 cwts); Newfoundland, 410,150 cwts (629,305 cwts); other places, 690,284 cwts (557,384 cwts). A total of 1,722,675 cwts, as against 2,235,645 cwts, in 1920.

Packings and Wrappings: From Finland 104,920 cwts (340,440 cwts in 1920); Sweden, 300,400 tons (1,502,000 cwts); Norway 145,062 cwts (732,343 cwts); Germany, 91,661 cwts (151,500 cwts); Belgium, 49,726 cwts (68,072 cwts); Canada, 10,863 cwts (93,270 cwts); other places 85,517 cwts (177,332 cwts). A total of 788,149 cwts as against 3,065,159 cwts in 1920.

The imports from Newfoundland show an increase over July. Packing and Wrapping papers from Canada also increased above July.

Judging by the imports they are more healthy looking than the exports and the supplies from Germany and Finland increased during August.

Paper Mills Close.

A notice has been issued stating that the paper mills at St. Paul's Cray, in Kent—close to London—have closed for an indefinite period. Arrangements have been made to pay the workers unemployment benefit on the premises. Depression in trade is attributable for the closing down of the mill, no orders coming in to keep the machinery and hands going.

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. Estimation of Cellulose in Wood. J. Ind. & Eng. Chem., xiii (April 1921). Johnson asserts that Dore's statement to the effect that "all processes involving preliminary hydrolysis result in a diminished yield of cellulose as well as total cellulose processes" (**J. Ind. & Eng. Chem.,** xii, 264, 1920), and Mahood's statement to the effect that "modification of the Cross and Bevan method proposed by Johnsen and Hovey appears to be of doubtful value since the cellulose, as well as the hemicelluloses and furfural-yielding constituents, are attacked" (**J. Ind. & Eng. Chem.,** xii, 873, 1920), are not backed by convincing experimental data, are based upon insufficiently analytical data and upon statements which are misleading and partly incorrect. Mahood retorts that "Johnson offers no new experimental data in support of this rather sweeping statement," and proceeds to prove that his results and conclusions are in agreement with those of most other investigators with the exception of Sieber and Walter and of Johnsen and Hovey. Dore maintains his original contention that "all processes (for the determination of cellulose in woods) involving preliminary hydrolysis result in a diminished yield of alpha-cellulose as well as total cellulose," that the total cellulose and alpha-cellulose are destroyer in the same proportion, that at most only a trifling reduction in furfural yield of the cellulose obtained is accomplished by the Johnsen and Hovey method, and that the method is unsuitable for scientific investigations on the chemical nature of woods or other cellulosic materials.—A.P.-C.

A-3. Phragmites Reed for Pulp. Cellulosechemie, i, 7 (Nov. 12, 1920), 8 Dec. 10, 1920), 9 (Dec. 24, 1920); **Paper,** xxviii, 1 (March 9, 1921), 2 (March 16, 1921), 3 (March 23, 1921). Abridged translation by CLARENCE JAY WEST. Detailed report of a complete laboratory scale and semi-commercial scale study of the use of reed for the manufacture of paper pulp. The soda process of cooking was used, and the pulp could be bleached to a good white; but the process is as yet too complicated for practical purposes. Handmade sheets prepared from the pulp indicated a satisfactory strength. Further investigations are under way relating to the botanical properties and it is hoped to systematically solve the many problems which have arisen during the course of the present work.—A.P.-C.

B-2. Conservation of Timber in British Columbia. R. W. HIBBERSON. **Pulp and Paper,** xix, 325-7 (March 24, 1921). An analysis of the timber supply of B.C., showing the danger of its exhaustion in a relatively early future, and of the urgent necessity of conservation and of adopting less wasteful methods of logging. —A.P.-C.

B-2. Planting for Pulp and Lumber. Pulp and Paper, xix, 193 (Feb. 17, 1921). Brief description of the planting of loblolly oldfield, and longleaf pines seed by the Great Southern Lumber Company on a 2,800 acre tract of cutover land.—A. P.-C.

B-9. Tax or Embargo on Canadian Pulpwood. FRANK J. D. BARNJUM. **Pulp and Paper,** xix (March 3, 1921). A "partial picture of destruction" wrought by the budworm and fires in Quebec and New Brunswick, with a discussion of the resulting imminent shortage of pulpwood to show the necessity of the government's putting a heavy export tax or embargo on fee land wood.—A. P.-C.

B-0. Canadian Woodlands Section. Pulp and Paper, xix, 209-14 (Feb. 24, 1921). An account of the meeting held in Montreal, January 19, 1921, including address by O. M. Porter, representative of the American Woodlands Section, and papers by G. H. Anson on the organization of a woods experiment station, and by G. C. Piché (chief forester of the Province of Quebec) on the establishment of a forest rangers' school.—A. P.-C.

C-7. Thorne Barking System. Pulp and Paper, xix, 174-6 (Feb. 10, 1921). The barker consists essentially of three trough-shaped pockets made of steel plate. In the bottom of the pockets are slots through which the wings of the double-ended cams act on the logs to give them a rolling and rubbing action on each other, which effectively removes the bark. A heavy spray of water is played on the logs in the pockets, which washes the loose bark out of the machine through the cam slots into troughs below which carry it away. By feeding at the normal capacity of the machine the percentage of overbarked logs is negligible, and those which are discharged before being fully barked are dropped through a gap in the conveyer carrying them from the barkers and returned for another passage through the machine. The machine was developed with the following ends in view, (1) to eliminate as far as possible manual handling of the logs from the time they are placed on the haul-up until they are delivered to the chippers; (2) to abolish slashing and avoid the needless loss in sawdust; (3) to bark the logs clean without loss of pulpwood and at the same time avoid brooming the ends; (4) to stock-pile the logs in such a way that the maximum drying effect could be obtained. A feature of considerable importance is the exceptionally low maintenance cost on the machine. (This system is covered by Can. patent No. 201,846, July 13, 1920. Abs.)—A.P.-C.

E-2. Alcohol and Fuel from Sulphite Waste Liquor. N. E. CLEMENTSON, representative in Canada and the United States for A. B. Ethyl, Stockholm, Sweden. **Pulp and Paper,** xix, 317-22 (March 24, 1921). Description of the new methods of the Ethyl company for the recovery of alcohol and solid fuel from waste sulphite liquors, of the extent to which the process is used in Europe and America, and of the uses to which the alcohol can be put. Comparative analytical data are given to show that the quality of sulphite spirits is equal to that of grain or potato alcohol. The cost of production in a 70-ton sulphite mill would be 21.4 cents per gallon of 95 per cent alcohol and $5.13 for an amount of sulphite "coal" having a heating value equal to one ton of the best steam coal (6,500 kg. Cal.).—A.P.-C.

E-4. Calcium Analysis of Fresh Sulfite Liquors. RUDOLPH SIEBER. **Zellstoffchemische Abhandlungen,** i, 7 (June 15, 1920); **Paper,** xxviii, 3 (March 23, 1921). Translation by Clarence Jay West. The

results of a comparative investigation of the well-known methods of analysis of the sulphite liquor and the Sander's method as used by Dieckman are given. Sander's method is briefly as follows: The original solution is diluted tenfold and 10 Cc of the diluted solution are titrated in the usual manner with tenth normal iodine and starch to blue color; then 5 Cc of 3 percent potassium iodate (KIO_3) solution (an excess must be present) is added, and the iodine which is liberated is titrated with tenth normal thiosulphate solution. The method has proven entirely suitable for practical use and will give correct values for the lime content of the liquors. It appears to be independent of those factors which influence the results obtained by Winkler's and Hohn's methods, and it is believed the method will prove suitable for general introduction in the industry.—A. P.-C.

H-5. Liquid Chrorine for Bleaching. L. N. GOEBEL, **Paper,** xxvii, 2 (March 16, 1921). Description of the containers used for the transportation of liquid chlorine and of the equipment used for the preparation of bleaching solutions from liquid chlorine.—A. P.-C.

H-0. Electrolytic Bleach in India. R. SITARAMA RAO. **Pulp and Paper,** 276 (March 10, 1921). Brief analysis of the possibilities of making electrolytic bleach in various parts of India.—A.P.-C.

K-10. Chemical Reactions in Sizing Paper. W. E. BYRON BAKER. **Pulp and Paper,** xix, 215-6 (Feb. 24, 1921). See **Pulp and Paper,** xix, K-10 (April 7, 1921).—A. P.-C.

K-12. Electrical Association Discusses Paper Machine Drive. Pulp and Paper, xix, 247-8 (March 3, 1921). Brief outline of paper by F. G. Warburton on the Harland Speed Inter-Lock as applied to paper machine (Cf. **Pulp and Paper,** xix, 59-64, Jan. 2, 1921) at the meeting of the St. Maurice Valley branch of the Canadian Electrical Association, Feb. 23, 1921, and of the ensuing discussion.—A.P.-C.

K-14. Accessory for Newsprint Rewinders and Calenders. E. MARGUET. Papeterie, xlii, 691-3 (Aug. 10, 1920); **Paper;** xxviii, 2 (March 16, 1921). Translation by A. Papineau-Couture.—A.P.-C.

K-0. Papers used in China. J. W. ROSS, Canadian Trade Commissioner. **Paper,** xxviii, 3 (March 23, 1921). Brief discription of the various kinds of papers required by the Chinese trade.—A. P.-C.

K-0. Cotton Linters for Papermaking. H. A. LINDENBERG. **Paper,** xxviii, 2 (March 16, 1921). Outline of the future outlook for cotton linters in the paper manufacturing field, with special reference to their utilization for the manufacture of bond papers, roofing felt, and fiber board.—A.P.-C.

K-0. Paper Standardization. Paper, xxviii (March 9, 1921). Discussion emphasizing the need of standardization of sizes in the manufacture of paper.—A.P.-C.

K-0. Paper Standardization from Printer's Standpoint. H. J. WERNER, **American Printer** (Feb. 1921); **Paper,** xxviii, 2 (March 16, 1921). Reasons are given in favor of the following sizes: 19 x 27 for writings, bonds, etc.; 22.5 x 32 for writings, bonds, cardboards, etc.; 27 x 38 for book papers and double size writngs; 38 x 54 for double size book papers; 45 x 64 for double size book paper; and of the gradual elimination of the undesirable sizes so as to cause the fewest manufacturing changes.—A.P.-C.

M-4. Belt Transmission for Paper Machines. VINCENT HAZARD, **Paper,** xxviii, 1 (March 9, 1912). A description of the power transmission features of the fourdrinier book machine illustrated in **Paper,** for November 10, 1921.—A. P.-C.

M-0. Laboratory Thermometers. W. D. COLLINS, **J. Ind. & Eng. Chem.,** xiii, 240-1 (March 1921). Specifications proposed by the Committee on Guaranteed Reagents and Standard Apparatus of the American Chemical Society for three standard thermometers (20° to 150° Cent. in 1° intervals; —10° to 360° Cent. in 1° intervals; —5° to 105° Cent. in 0.2° intervals) are given, together with a few comments on the reasons which prompted the choice of these thermometers as standard apparatus and on a few of the details of the specificatins.—A. P.-C.

M-0. R-13. Canadian Mechanical Standards, Paper xxvii, 26 (March 2, 1921). Report of the Committee on Mechanical Standards of the Technical Section of the Canadian Pulp and Paper Association, presented at the annual meeting at Montreal, January 19-20 1921,,—A.P.-C.

N-5. Safe Storage of Coal. H. H. STOEK. **Paper,** xxviii, 3 (March 23, 1921). Hints on the proper methods of storing coal as given in the U.S. Bur. of Mines Technical Paper 235.—A.P.-C.

R-5. Reasons for a Cost System. T. J. BURKE, **Paper,** xxvii, 26 (March 2, 1921). The two main reasons for which a cost system should be installed are (1) to ascertain true manufacturing costs to serve as a basis for fixing selling prices; and (2) to eliminate waste by finding where it occurs.—A. P.-C.

O-3. Water Purification by Continuous Blow-off. G. PARIS. **Chimie et Industrie,** iv, (December, 1920); **Pulp and Paper,** xix (April 7, 1921). Description of the continuous blow-off method of boiler water purification and of its merits and advantages over other processes. The method consists essentially in allowing a certain proportion of the water in the boiler to blow off into a steam separator. The separated steam is made to bubble up through the raw make up water which has been mixed with sufficient soda ash to precipitate the noncarbonate-incrusting solids in the water, while the separated blow-off water travels slowly enough to allow the sludge to settle out, and then mixes with the raw water which also travels slowly enough to allow the precipitated incrusting solids to separate out. The principal advantages are low consumption of purifying chemical, high temperature for the feed water, and small and compact equipment which can easily be made practically self-regulating.—A. P.-C.

R-1. Japanese Pulp and Paper Industry. Pulp and Paper Association and the Technical Section of the C.P. status of the Japanese pulp and paper industry and of some of the contemplated developments, more particularly of greater utilization of the forest resources of Manchuria and Korea.—A.P.-C.

R-11. Use of Microscope in Pulp and Paper Mill. I. L. GARTLAND, **Paper,** xxvii, 26 (March 2, 1921); **Pulp and Paper,** xix (March 31 and April 7, 1921). General description of the construction and uses of the compound microscope (lenses, accessories, types of instruments, etc.), followed by a few comments by H. N. Lee, Hammermill Paper Company, Erie, Pa., on specific uses of the microscope in the pulp and paper industry.—A. P.-C.

UNITED STATES NOTES

A great future for the timber and allied industries of the Philippine Islands is predicted by W. Cameron Forbes, former Governor-General of the Islands, and General Leonard Wood, the new Governor-General. General Wood, following a recent tour of the archipelago, stated that there is enough timber in the Philippine Islands to take care of most of the lumber and wood using industries of the Far East. He said that nearly 230,000,000 feet of lumber was cut in 1920, of which in the neighborhood of 15,000,000 was exported. Gen. Wood favors the immediate initiation of wise forestry measures so as to assure replacement of trees cut. The Philippine forests, he pointed out, are full of the most valuable woods, and there is a possibility of great development in the production of rubber. camphor, etc., also an enormous amount of other forest and jungle products. A. F. Fischer, director of forestry of the Philippines estimates there are 72,224 square miles of standing timber in the islands, and that on this area the stand of timber is 200,000,000,000 board feet. This timber, which is owned by the government, is estimated to be worth $400,000,000.

The Hummel-Ross Fibre Corporation, Hopewell, Va., manufacturers of Kraft pulp and paper, announce that Walter Clifford has been engaged for the place of general superintendent of their plant. Mr. Clifford resigned as head of the sulphite department for the Champion Fibre Company at Canton, N.C., to go with the Hummel-Ross company. During the two and a half years he served the Champion Company, Mr. Clifford rebuilt the sulphite mill from 25 tons per day to a daily capacity of 75 tons of bleached sulphite pulp.

Despite the efforts of a huge force of fighters, flames from a forest fire near Los Angeles, California, last Saturday swept into San Francisquito canyon and threatened to destroy much property in that section of the mountains. The most dangerous of several fires near Santa Barbara were reported under control after they had burned since early in the week. Fires that caused considerable damage were raging in several localities in Colorado toward the early part of this week and, according to latest reports, are not yet under control.

The ambitious forest acquirement project planned in the main by Gifford Pinchot, Pennsylvania State Forester, was halted, and probably side-tracked for at least four years, when Pennsylvania voters rejected recently to the proposal for a convention to revise the State constitution. The convention, if one had been held, would have considered the authorization of a state bond issue of $25,000,000, the money to be used for the acquirement of denuded lands by the commonwealth for reforestation purposes. This proposition might have been rejected if other issues had not been involved in the calling of the constitutional convention, as it was apparent that sentiment in favor of the forest bond issue was rather widespread. Authorization of the bonds must now be sought through amendment to the old constitution, a time-consuming business.

For some time it has been a rather open secret that Forester Pinchot contemplates resigning his state office in Pennsylvania at no very distant date and concentrating his energies on national conservation work, which he had to suspend to a large extent when Governor Sproul persuaded him to give his services to the commonwealth. He recently closed his private offices in Philadelphia and opened quarters in Washington. When he retires as state forester he will leave a department thoroughly reorganized, in good running order, with a definite program of work and manned by competent people.

Of approximately 6,000,000 acres of land in Pennsylvania suitable only for the growing of timber, the state now holds slightly more than 1,000,000. Another million acres at the headwaters of the Alleghany river in the northwestern part of the state eventually will be taken over by the United States government for a national forest, the creation of which has been authorized. This leaves 4,000,000 acres which the state may take into its forest system still to be acquired.

The Bag and Textile Products Corporation was incorporated at Springfield, Ill., recently with a capital stock of $50,000. The company will engage in the manufacture and jobbing of paper and textile specialties, bags, etc., Company offices have been opened at 68 S. Dearborn street, Chicago. The incorporators are: James C. Mastin, M. M. Foehringer and B. Vrooman.

The amount of envelopes used yearly in advertising is staggering, according to officials of the Orgler Envelope Company, New York City, who put the number at several billions. The efficacy of the envelope as an advertising medium has been fully demonstrated and septics to zebra hides. The folding envelope containing a printed story on the inside is a particular favorite and combines economy with efficiency.

In a current number of "The Nation's Business" is contained an interesting article bearing on paper made from grass and several unheard of raw materials for pulp. It recounts the endeavors of the Imperial Insittute of Great Britain, which has had more or less success in paper making from grasses and trees indigenous to Africa and India. More than thirty plants on which thousands are used to sell every commodity from anti-experiments have been made in the last eight years are listed in a recent publication of the Institute, says "Nation's Business." Rice straw and husks, linseed stalks, sunflower stems, these are familiar sounding, and baobab and bamboo, are not entirely novel, but what of mugugyboya bark or tambookie grass? Not much of mugugyboya, but of tambookie we are told that "it is well adapted for paper making and in normal times the crude material would be worth about $20 a ton in the United Kingdom." Our grocer born in Greece or Italy may yet wrap our tea grown in China in paper made from grass grown in South Africa.

C. F. Dutcher, who for many years has been the executive head of the Interstate Tablet Company, Chicago, has sold out his active interest in the firm. Mr. Dutcher was the founder of the company, and while he will no longer be interested financially, he will continue in its employ as general manager.

PULP AND PAPER NEWS

The Dominion general election will, it has now been definitely decided, take place on the 6th instant. This will give time for an unusually long electoral campaign, in the course of which it should be possible for the issues to be put before the electorate both extensively and intelligently by the spokesmen of the three parties that are contending for power. The position of the three respective parties on the vital questions of the hour will be impartially summarized in an early issue of the Pulp and Paper Magazine. Meanwhile, it is of direct interest to the trade to learn that the electoral campaign, besides being unusually lengthy, will be on an exceptionally elaborate scale. Posters, pamphlets, newspaper advertising, augmented newspaper circulation—all will make an increased, and assuredly a welcome, demand on the products of the industry.

While touching on matters political, mention should not be omitted of the action that has been taken by the Hon. H. H. Stevens, the new Minister of Trade and Commerce, in connection with the detrimental effect on the newsprint export branch of the Canadian paper industry by the recent establishment by the Australian Government of a duty of some $15 a ton on newsprint paper entering the Australian Commonwealth from all other countries than Great Britain. Reference has been made in these columns, before now, to the apparent supineness hitherto exhibited by the Dominion Government in this matter. But Mr. Stevens—acting, perhaps, on the principle that "new brooms sweep clean" —has now announced that his department is making special efforts to have the Australian preference tariff, accorded to Great Britain, on paper extended to Canada. Since assuming office, the new Minister has opened up fresh negotiations with the Australian Government in behalf of improved trade relations between the two countries. May his efforts in this direction—and especially in the matter of newsprint—be crowned with success !

After being shut down for quite a while, the plant of the Bathurst Company at Bathurst, New Brunswick, has resumed operations with the result of affording employment to some hundreds of hands.

Fire losses during last month, according to the Monetary Times estimate, reached a total of $2,410,300, which is almost $600,000 less than the total of August, and $70,000 less than that of September in last year. But, although there are three months yet to go in this year, the total fire loss for the nine months of this year that have so far elapsed, is only $3,000,000 short of the entire total of last year's fire loss. So that it is practically certain that the total fire loss for this year will exceed the 1920 record.

The plant of the Nipigon Fibre and Paper Company, of Nipigon, Ont., has resumed operations, after being closed down for a short time. A large increase in capacity and, later the erection of a newsprint mill are in contemplation. Indeed, it is anticipated that the daily capacity of the plant will shortly be increased from fifty tons to a hundred tons of groundwood pulp.

The Board of Governors of the Allied Printing Trades is to meet in Toronto this month. It so happens that the meeting will take place while the United Typothetae of America is in session.

The distribution of a supply of coal, or a bonus in lieu thereof, to the striking printers in Toronto, and elsewhere in Canada, was decided upon, several weeks ago, by the headquarters of the International Typographical Union which possesses a strike fund greater than is requisite for the financing of the strikes in progress in Canada and the United States. Arrangements have now been made by the Strike Committee of Local 91, International Typographical Union, for the distribution of fuel to the married men among the Toronto striking printers, or, in cases where the members may reside in apartments, to grant them pecuniary allowances equal in value to the bonuses being distributed in coal to other members.

At a recent meeting of the striking printers of Toronto, Superintendent E. J. Hopcroft, of Donlands Methodist Church in that city, quoted a reference to the Union made by the Rev. H. D. Moyer, Methodist Minister at Goderich, Ont. The latter's remarks commended the action of the Toronto Typographical Union at a meeting, a short while back, which resorted to prayer for the Divine blessing on the striking printers' cause. "When we consider," he said, "that the typographers of Canada and the United States have added ten years to the lives of 50,000 people, have established a home for the sick and aged, raised wages, shortened hours, raised $1,000,000 for old age pensions, and maintained a great system of education, whether they realize it or not, they are making a valuable contribution to the building of God's kingdom and something definitely spiritual in character. What is more natural than that, sooner or later, they should seek the conscious fellowship of Him Who gave His life for the Kingdom? Were Jesus Christ to come back to earth today, I think He would feel more at home in some of the Labor Unions than in some of our churches." The fact that both the Ministers who spoke in this sense are Methodist Ministers gives a certain emphasis to the situation in Toronto, in view of the circumstance that the Rev. Dr. S. W. Fallis, who is chairman of the Defence Committee of the Toronto Typothetae, is also the steward of the Methodist Bookroom.

The master printers in Montreal, by the way, have followed the example of the master printers in Toronto in establishing a school for the training of compositors.

Action has been entered by the Ontario Provincial Government against W. H. Russell, of Port Arthur, Ont., in respect of reimbursement of timber alleged to have been illegally taken by the latter. It is alleged that large quantities of pulpwood have been taken off mining locations, without compliance with the provisions of the Mining Act, and that quantities of pulpwood have been wrongfully cut from Crown lands.

The most needed equalization is not that of the rich and the poor, but that of the over-eaters and the under-eaters.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 8th Oct.—While the general situation in the industry is unquestionably improving, it is yet not without special difficulties of its own at the moment. In conversation with various men prominent in the industry, it has been borne in upon the writer that these difficulties are greatly accentuated and aggravated by the fact that jobbers, in practically every paper line, are going in for price-cutting. It is possible that the extent to which this practice is going on may be magnified by some who conceive themselves to have been injuriously affected by one or two particularly glaring instances which one hears of. But, at the same time, it is notorious that this price-cutting is going on, and those who suffer thereby—or some of them—have, more than once, told the writer that, in their view, a little judicious publicity would be beneficial in stopping, or, at any rate checking, the practice. It is certainly one which strikes at the root of proper method and system. It hampers and hinders due stabilization. For the situation could be stabilized a good deal more readily and easily of this undercutting of prices—and, in one or two recent instances within the writer's knowledge, it has been of a rather indiscriminate kind—were non-existent. The truth probably is that individual jobbers need to have more confidence in each other than they always evince. The manufacturer is certainly doing his part. He is endeavoring—and, in most cases, to the utmost of his power—to co-operate with the wholesaler with the object of stabilizing prices. And it is beyond dispute that if all wholesalers would do their part—which, in certain individual instances, they are not doing—and would be loyal to re-sale prices, much good, in the direction of stabilization, could be accomplished.

The recent improvement in the demand for many kinds of paper continues to be maintained. This, no doubt, is part of the general improvement in the tone of business conditions. According to so high and well-informed an authority on the subject of business as Lord Shaughnessy, "the business outlook in Canada" can be regarded as "promising." This is partly due, as he indicated, to the fact that "the greatest crop, about 275,000,000 bushels, is the greatest ever harvested." This has had a very favorable stimulus on Canadian business generally. It is especially fortunate, in this connection, that, as Lord Shaughnessy pointed out, the United States tariff against Canadian wheat has had no unfavorable effect—in fact, wheat is even moving into Canada from that country.

Altogether, there is no doubt that there is a tone of distinct, if tempered, optimism to the industry. In these colums, the recovery, which is process, has several times been predicted as almost certain to occur at the time at which, as events have transpired, it did, in fact, commence to take place. And it may, with equal confidence, be prophesied that, from now on, there will be a progressive betterment pronounced in nearly all lines. Particularly is optimism pronounced in the West.

PULPWOOD.—There is little change in the pulpwood situation. Nor is there any to be anticipated as has previously been stated in these columns, for a considerable time. Canadian mills, for the most part, have large stocks on hand. And the same thing is true of many mills in the United States. Consequently, logging operations will be on a much more limited scale than usual. As regards prices, there is not likely to be much change for some long time yet.

PULP.—The market for pulp has been showing some improvement in the last week or two. But it is the contention of manufacturers that prices are still very low.

NEWSPRINT.—There is a distinct increase in the demand for newsprint. A good many contracts have been closed up at the fixed price of $80 per ton. But many attempts are being made to secure newsprint at less than that figure, and it is likely that a number of prospective purchasers are, for the present, postponing the closing up of contracts in the hope of being able to do so a little later on. It is somewhat of a detriment that a considerable amount of uncertainty as to whether or not the set price of $80 a ton will obtain for the full current quarter still seems to prevail. Why there should be such uncertainty is not very readily explicable. If trade has now turned the corner, and is on the up grade, as the best informed opinion undoubtedly inclines to think, then there would seem no reason for apprehending that a price less than $80 a ton is likely in the current quarter.

MANUFACTURING STATIONERY. — There is a very encouraging improvement in the demand for manufacturing stationery. Orders are coming in in greater volume and of larger size than had been the case for a long while.

WRAPPING PAPERS. — Business in wrapping papers continues to pick up. Prices are now at rock-bottom. Such, at any rate, is the very general concensus of opinion among manufacturers.

WASTE PAPERS.—As was mentioned last week the demand for waste papers has substantially increased., and this improvement in conditions is still maintained. In fact, the situation, as regards both rags and waste papers, is visibly strengthening—a result which was really inevitable from the fact that many mills had allowed their stocks to become unusually depleted.

BOOK PAPERS.—The situation in book papers continues to afford considerable ground for gratification. The demand appears to be on a really progressive scale.

TOILETS AND TISSUES. — As with wrapping papers, manufacturers generally are agreed that prices are now definitely at rock bottom in toilets and tissues and paper bags.

PARCHMENT.—In this line also business is satisfactory, and here, too, manufacturers assert that there is no prospect of a diminution in price.

NEW YORK MARKETS.

New York, October 8—(Special Correspondence).—Increasing activity continues to characterize the paper market. Reports from all directions tell of business picking up at a satisfying rate; manufacturers are busier than they have been in months and are booking orders involving large amounts of paper, while jobbers in New York and various other centres tell of con-



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sumers consistently broadening their buying, with the obvious result distributing concerns are finding more to do than in a long time. The situation as a whole is quite gratifying. Consumers are buying carefully though in heavier volume, showing that consumption of paper is on the rise, thus making for a healthy tone to the market. Prices are becoming well stabilized. Instead of the trend being downward, as it has been for a period of a year or longer, most grades of paper exhibit an upward tendency, as prices are strengthening under increased trade activity.

A feeling of confidence permeates the trade that the improvement thus far scored will continue. It is more or less proverbial that the fall of the year is a lively period for the paper industry, and producers and dealers believe that the improved demand that has set in will not react during the next several months. Opinion is general that the situation will steadily grow better, and that between now and the first of the new year will prove a busy time for the paper trade.

Newsprint demand is gradually expanding. Mill representatives are practically a unit in reporting a larger movement of supplies to publishers, and anyone watching the daily newspapers in New York City alone can readily see the reason for this. Local publishers are printing larger issues almost every day. Department stores in this locality are making a drive to stimulate retail buying and are using an immense amount of printers' ink and advertising space in the morning and afternoon papers to help along the good work. What is happening here is being duplicated all over the States, which means that consumption of newsprint is sharply on the increase.

Prices on newsprint have steadied perceptibly since the first of the current month, when the new contract basis of 4 p.c. per pound on roll news went into effect. Publishers are freely entering commitments on this basis, and are also purchasing considerable tonnage in the open market. Spot prices are steadier than in some time at around 3.50 to 3.75 cents per pound, with some mills demanding and receiving the same price on spot deliveries as on contracts. Were it not for the influence of offerings of imported newsprint at low prices there seems little reason to doubt that spot prices would rise beyond the contract level—where they rightfully belong—and indications are that if present market conditions continue to obtain, spot prices will assume their normal position a little in excess of the contract basis.

Improvement in book paper demand is quite marked. Since the patching up of the wage difficulty between employing printers and their employes activity in the printing trades has shown a steady increase, and the consumption of book papers is improving accordingly. Trade publications, magazines and other periodicals are getting back to normal size and are requiring more paper, which situation is reflected by a broader demand for book paper. Prices are steadied though generally unchanged, with machine finished book bringing an average of 6.25 cents per pound f.o.b. New York and super book around 6.75 cents.

Wrapping papers are enjoying a good demand and are firm in price; in fact, kraft wrappings display a decided upward tendency at a quotable basis of around 6 to 6.25 cents f.o.b. delivery points on No. 1 domestic kraft. Tissues continue active, and the rising trend of ground wood seems likely to carry on coarse tissues up in the near future. Fine papers are moving in larger volume right along, the improvement in business generally being clearly reflected in this branch of the paper market.

Boards are firming and are moving well. Some mills in the East are quoting $40 a ton f.o.b. New York on plain chip and $45 on news board though the bulk of business at present is being consummated at slightly lower figures, around $37.50 on chip and $40 on news being prevailing market values. A majority of board plants are reliably said to have enough orders on file to keep them engaged for two months and longer, and substantial improvement in the paper box industry is a strong factor.

GROUND WOOD.—The ground wood market is firm and characterized by considerable trade activity. If anything, demand is expanding, there being numerous buyers among newsprint, tissue and other paper manufacturers and board producers in action, and offerings of pulp are finding ready takers. Many grinders seem disposed to ask higher prices. Quotations of domestic manufacturers range as a rule around $30 per ton at grinding plants, but higher figures are named in some quarters, up to $35 being asked in certain cases. A strong feature of the situation is that European producers are naming higher quotations, it being stated that about the lowest at which mechanical pulp can be bought on the other side of the Atlantic now is $30 landed here, with offerings even at the advanced level of smaller volume than recently. From all indications stocks of domestic mills are declining, which adds to the market firmness.

CHEMICAL PULP.—There is a fairly good demand for most kinds of chemical pulp and quotations either are holding steady or are gradually working upward, yet it is said that paper mills are still absorbing in the aggregate but a comparatively small tonnage of pulp. Evidently the anti-dumping agitation is causing some

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consumers of pulp to remain aloof as buyers owing to the uncertainty that this factor naturally gives rise to. Importers in New York held a meeting on Thursday at which the subject of dumping was discussed at great length, following which it was announced that proof of a documentary character was submitted showing that none of the European countries is dumping pulp into America. This proof, it was said, would not be made public at present, but, it was stated, when it is made known will show that the anti-dumping agitation is unfair and uncalled for and that its origin is practically entirely among a handful of domestic pulp manufacturers who take a selfish view of the situation.

Quotations on foreign sulphite are hardening, and bleached sulphite of imported variety is generally held at a minimum of 4 cents per pound on the dock for No. 1 grade, and No. 1 unbleached at from 2.75 cents upward. Kraft pulp is quotably firm, with but small supplies offered at 2.75 cents a pound, both domestic and Scandinavian kraft being held at this price basis. Domestic news grade is steady at around 2.50 cents a pound at pulp mills, and soda pulp at 4.25 cents.

RAGS.—While signs point to paper manufacturers buying rags in rather limited volume, the tone of the market is steadily growing stronger, and dealers view conditions in such a bullish light that many of them are not endeavoring to effect sales at present, choosing to hold stocks for higher prices which they contend will be obtainable in the near future. Roofing rags are decidedly firm in price. Felt mills in the Midle West are buying actively and have paid up to 1.35 cents a pound at shipping points for No. 1 roofing stock, while eastern mills are beginning to evince more interest and are offering around $1 per hundred pounds f.o.b New York for No. 1 packing and between 85 and 90 cents for No. 2 satinets. Dealers assert that roofing rags are held in light supply and that they are coming in from collecting sources in small amounts, and predict a steady rise in prices. New white shirt cuttings also are a firm item. Bids of 9 cents a pound for No 1 cuttings at shipping points frequently are turned down by dealers, who want a half cent or more higher. Old whites are strengthening in price, as are old blues.

PAPER STOCK.—Waste papers continue to mount in price and there is no sign of any impending easiness in the market. Instead, dealers and packers are repeatedly naming higher figures to mills, and are flatly refusing to book orders for large tonnage while claiming to be having much difficulty in locating usual amounts of material. On the other hand, prices have shot up with such rapidity that mills are letting up in their buying to an extent and there does not seem to be as large a demand for some grades as recently. No. 1 soft white shavings, which are especially wanted by mills, are held at a minimum of 3.25 cents a pound at shipping points, and some dealers are asking higher than this price. Hard white shavings are quoted at between 3.75 and 4 cents a pound, old No. 1 heavy books and magazines at 1.50 to 1.60 cents, white blank news cuttings at 1.90 to 2 cents, old No. 1 kraft at 2.20 to 2.30 cents, folded newspapers at 65 to 70 cents a hundred, and No. 1 mixed papers at 50 to 55 cents. Such grades as new kraft and manila cuttings are said to be practically unobtainable in sizable amounts in New York and vicinity.

OLD ROPE AND BAGGING.—Prices on old manila rope have strengthened to a point where dealers are insistent on at least 4.50 cents per pound for rope in No. 1 condition. There is a good demand, with available stocks of rope appearing light. Old bagging is quiet but displaying a firmer tone at a quotable basis of around 75 cents per hundred pounds at shipping points on No. 1 scrap bagging.

MEETING OF SECTION OF CELLULOSE CHEMISTRY.

The New York Meeting was the fourth consecutive meeting at which a special time and place has been set apart for the consideration of the chemistry of cellulose. The first two were symposia under the auspices of the Industrial Division and the other two regular meetings of the Cellulose Section. The interest at the present session was well sustained and the discussions free and valuable. There seemed to be general appreciation of the fact that in view of the very considerable amount of work on cellulose chemistry which is being done abroad we in this country will have to put special emphasis on this important field if our many cellulose industries are not to be left woefully behind in the race.

In an interesting paper Dr. Hibbert, chairman of the Section, outlined the results which have appeared since the last meeting bearing on the constitution of cellulose. Dr. Hawley of the Forest Products Laboratory told of some of the research of that institution which has considerably increased the yield of methanol in wood distillation. The paper by Dr. Tingle on the "Alleged Absorption of Alumina from Solutions of Aluminium Sulfate by Cellulose" aroused much discussion, both among paper men and manufacture of aluminium sulfate.

Professor Hibbert presented the report for the Committee on the Preparation of Standard Cellulose. At the recommendation of the committee it was voted that Dr. Johnsen be requested to present for publication a proposed method for the preparation of the standard sample of cellulose and that a copy be sent by the Secretary to each member of the Section with the request that criticisms be sent direct to Dr. Johnsen, c/o Hammermill Paper Company, Erie, Pa.

The report of the Committee on Viscosity Standards was presented by Dr. Esselen, Chairman of the Committee. By means of a questionnaire sent to the manufacturers and users of cellulose ester solutions the Committee had found that the number of laboratories using the falling ball method for determining viscosities was in large majority. They therefore recommended that they be authorized to proceed to draw up a set of standard conditions for carrying out this method. A vote of the Section authorized that this be done.

The paper by Professor L. E. Wise on the Requirements of a Brief Critical Monograph on the Chemistry of Cellulose excited much discussion. It was finally voted that a copy of the paper be sent to Dr. John Johnston and that he be advised that it was the opinion of the Section that a textbook on cellulose should be first prepared, to be followed after by monographs on specialized phases of the subject.

The Section voted to petition the proper authorities to form the Section into a regular Division.

The same officers were recommended for appointment for another term.

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UNCERTAIN ADVANTAGE OF CHEAP FOREIGN PAPER.

Canadian production of newsprint paper increased from 150,000 tons in 1909 to over 850,000 in 1920. Today the Canadian newsprint mills are equipped to produce about 1,000,000 tons of paper a year. They are supported by what is admitted to be the greatest potential pulpwood reserves in the world.

About 80 p. c. of the output of these mills is marketed in the United States. During the twelve months ended August 31st American newspaper publishers purchased and used no less than 637,266 tons of Canadian newsprint, exceeding the record of the preceding twelve months which included the period of the greatest demand for newsprint ever known.

Contracts for next year's supplies of newsprint are now being negotiated. They show no diminution in the American demand for Canadian paper.

The Canadian newsprint manufacturers, while appreciating fully these evidences of confidence and goodwill upon the part of their American customers, realize at the same time that it would be impossible for them to hold this confidence and goodwill if it were not to the advantage of the American publisher to buy his paper in Canada.

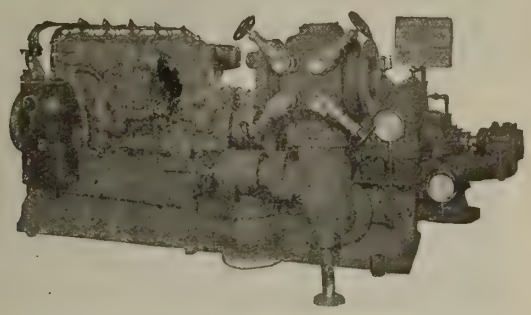
They believe that the quality of the paper they supply, the service they are able to render to their customers, the advantage they are able to offer through the proximity of their mills to the American publishing centres, their fair dealing and reasonable prices, are the factors which have brought them and will continue to bring them their American trade.

They take pride in the fact that their long connection, with and intimate knowledge of the American publishers' requirements enable them to supply paper best adapted to their needs and with a variation in weight and quality not greater than ½ of 1 p.c. They maintain expert traffic departments to control shipments from the mills to the customers' warehouses, which obviate irritating delays and other shipping annoyances. Their situation enables them to ship at short notices, relieving their customers of the necessity of maintaining large reserve stocks and of tieing up large amounts of capital, a distinct advantage in a market whose normal reserve stocks do not exceed 70 days' supply and frequently drop to less then half that amount. They recognize that the exigencies of the newspaper publishing business require the elimination, so far as is humanly possible, of all risks of non or uncertain deliveries. They believe it is of benefit to the publisher to be in close communication with his source of supply so that errors may be checked up and reparations secured, when due, without delay.

The Canadian newsprint manufacturers are confident that these factors outweigh in the long run the mere question of cheapness, and particularly so when cheapness is dependent upon the accident of a debased currency which, at best, can only be of temporary duration. They do not doubt that sensible American newspaper publishers realize fully their dependence upon a permanent supply of newsprint, produced on the American continent, whatever temporary advantage may be offered by a transient supply of low priced paper which will disappear with the causes that now alone make it possible.

They give the American publisher full credit for the ability and the willingness to examine the newsprint question on its merits in its broadest aspects both as to immediate expediency and future requirements and they entertain no apprehension as to his ultimate and intelligent judgment.—Canadian Pulp and Paper Assn.

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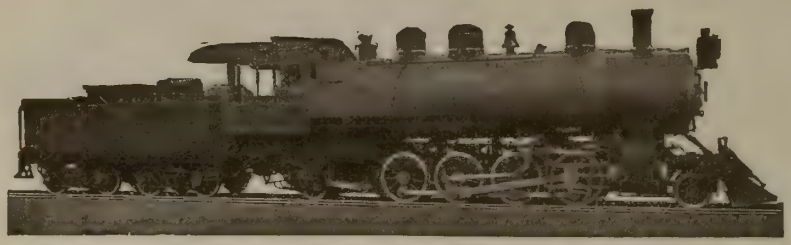
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VOL. XVIX. GARDENVALE, P. Que., October 20, 1921. No. 42

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

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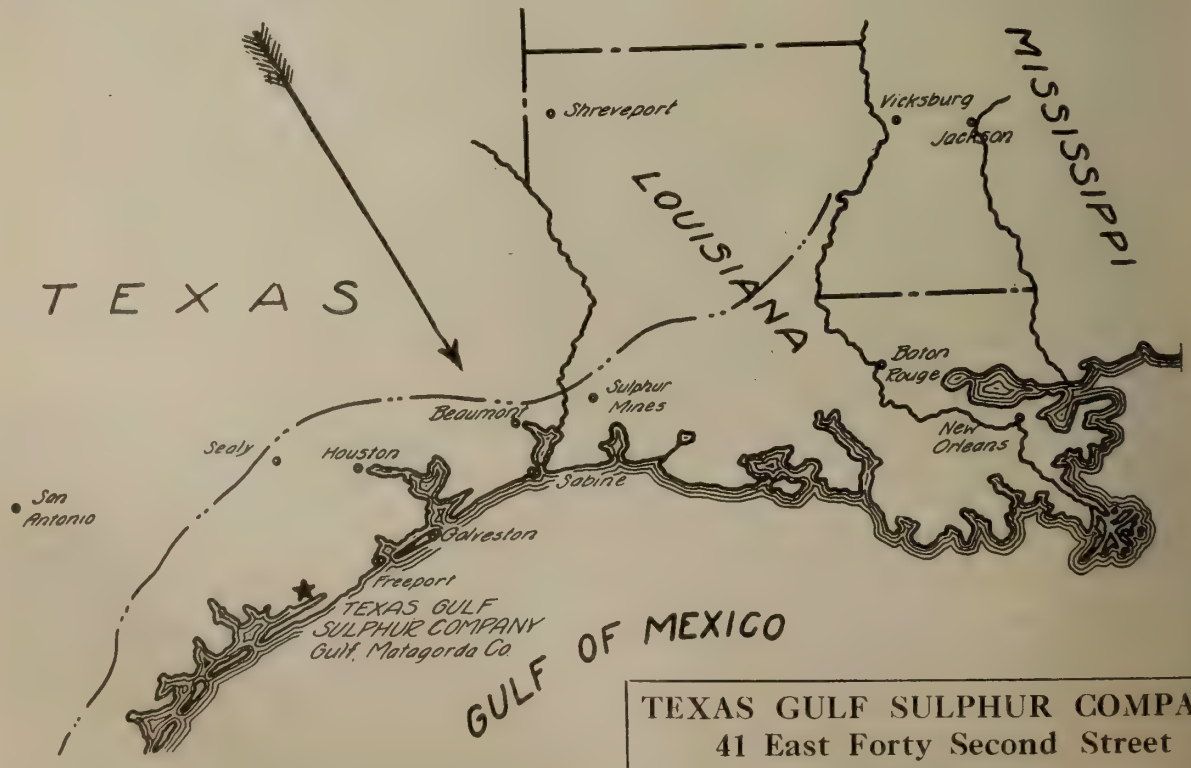
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EDITORIAL

WHAT IS PROSPERITY?

One of the expressions most frequently heard during the past six months, is, "normal times," or "normal conditions." President Harding has attempted to describe the whole situation by coining the word "normalcy." There is a little uncertainty as to just how this word would be defined but it evidently represents a condition of affairs which people generally are hoping will develop. It can hardly represent something to which we are going, in the sense of an approach to an established place or condition, nor can there be such an event as a return to conditions which existed in times past. The clock cannot be turned back nor can the wheels of progress be reversed. Business, society, politics and individuals are continually going forward and what is to come is not something that has gone before but something which we are building, shaping, and developing, every day and every week. We believe that **prosperity** is a better expression for the condition that we hope and work for than the word normalcy; it matters not whether the circumstances which are to surround us are like or unlike those in which we have lived and worked.

To bring about again, even were it possible, such conditions as we had two years ago or six years ago, would not bring any great degree of general satisfaction. Every set of conditions brings with it its own opportunities for happiness as well as its own difficulties and problems. The principal thing is that we should enjoy our opportunities generously and that we should meet our problems bravely and tackle our problems confidently. It is by making the best of the circumstances in which we find ourselves each day that we are prepared for a better tomorrow.

We do not want to go backward, we must go forward. We do not want the big earnings, the artificial living, the wasted opportunities and profits of yesterday, we want the happiness and prosperity that awaits us tomorrow. Prosperity and not normalcy is the object of our efforts and our hopes. The question then, is, "What is Prosperity?"

Prosperity cannot be expressed in terms of wages, nor in terms of profits, nor in terms of dividends. It can be expressed in terms of work for everyone with a sufficient return to provide for all of the necessities and a fair share of what may be called luxuries. The relief from worry which comes from the assurance of a steady job, thus bringing the opportunity to labor without anxiety, brings enjoyment and satisfaction to all who labor for those they love. This is the essence of prosperity. No matter what wages may be nor what profits may be, a nation, a community, or an individual is not prosperous in the true sense of the word unless there be satisfaction of accomplishment. An idle population cannot have this satisfaction. Profits taken at the expense of employment cannot bring this satisfaction.

It is, therefore, a matter of great concern that, especially at this time, every possible step be taken to maintain production on a basis which will give the widest possible employment. It seems a mistake and a pity that, as soon as there is evidence of greater demand for a product at this time, the situation is made an opportunity for increasing the price of the article rather than extending activities of production which by all the laws of economics should result in decreased unit cost and therefore, approximately the same gross profit in the long run as is obtained by the perhaps quicker and easier way of immediate boosting of the price.

There are apparently two reasons why prices are boosted under such conditions as we find today. One is that such a course may bring investors a higher profit in dividends, somewhat commensurate with the frequently unusual earnings of the past couple of years, and the second is that some concerns are so financially pressed that every opportunity must be taken to convert their products into the maximum amount of cash in order to liquidate their obligations. On the other hand, a little reasoning will show that apart all together from the concern's obligation and responsibility to maintain working forces at maximum strength from a purely humanitarian point of view, it is good business to sell the greatest possible volume at a fair profit.

One of the puzzling situations which confronts our industry at the present time, is competition with countries that are selling at a lower price than it may be possible to meet. This may be because other countries are satisfied with a smaller margin of profit or it may be that their costs are enormously lower than manufacturing costs here. Our point is that by keeping the selling price at such a point that but a fair margin of profit is obtained and with the confidence of the consumer that this is the case, there will be a constantly increasing demand and a consequently firmer hold on the market by manufacturers who follow such a course To follow such a policy will mean that many firms will be obliged to make rather drastic cuts in the value of raw materials. Such action has been fairly widely taken by many manufacturers already and no doubt

the figures used at the present time are fairly near the cost of replacement at current values. For a number of years some of our mills were prevented from marking up the prices of their product in harmony with increased costs of production and there is some question as to whether when the opportunity came to do so, they took sufficient advantage of it to completely recover the ground previously lost. This handicap was suffered principally by one branch of the industry while other branches should have benefited enormously by the unusual circumstances. If the present were a case of ordinary slackness of business, there would doubtless have been more prompt reflection of lowered costs and a wider drop in prices than has taken place.

The period of inactivity has, in some cases, it is stated, completely wiped out the profits made during the period of high prices. But even taking that unfortunate circumstance into consideration it seems that the best and perhaps the only way of developing a prosperous condition of affairs is to readjust prices to present costs, to reduce prices still further as cost of production may be lowered and thus while making a fair margin of profit, maintain the maximum production and consequently the maximum employment. By thus employing the greatest number it means that a greater number of people are spending and there is no doubt but that there would be a more immediate reflection on business conditions by distributing a large proportion of money received from goods among the employees who will immediately spend it for necessaries than to distribute a larger share of a smaller total return from limited production to a few stock holders who will be less likely to give such money an immediate re-circulation.

Mr. MILLEN IS 83.

Four years ago the editor first met Mr. George H. Millen, President of the E. B. Eddy Company. From Mr. Millen's keen observations and his bright, interesting conversation and the unusual activity with which he was known to carry on the affairs of this great company, we took him to be a man in the early seventies; in fact, many a one with fewer years appears older, but as Mr. Millen wears the little bronze button that marks him as veteran of the American Civil war, we knew he must be at least as old as the editor's father who had been his comrade-in-arms.

It is, however, not so much Mr. Millen's marked ability as a great industrial leader which marks his position in Canada, as the kindly character of the man which endears him to all of those with whom he comes in contact. This happy faculty of his for kindliness and cordiality was shown by an incident of our first meeting when, on remarking how much one of the little samples of Eddy's fibre wash boards, noticed in the office, would please the editor's niece, Mr. Millen's eyes immediately lighted up with appreciation of the pleasure that such a gift would bring and proceeded to have one of those little boards wrapped up.

When Mr. Millen wakes on Sunday to begin his eighty-fourth year, he will be able to look back on a life longer than the average by a good many years and a far more active one than of many younger men. He can, if his natural modesty permits him, recall many kindly words and acts and worth while accomplishments and he will certainly be assured of the friendship, the fellowship, the respect and the love of thousands who have come in contact with him and under the influence of his kindly personality. But Mr. Millen will probably not look back on the years past but will look forward, planning keenly for tomorrow's work and the developments to be accomplished in the years to come.



OTHER FOLK'S GERMS.

May get on you if you wipe your hands and face on a towel that they have used. Trachoma, gonorrhea, syphilis, and many serious diseases of the eyes and skin are often spread in this way.

Get a towel for your own use, keep it in a clean place, and do not lend it to others.

Paper towels are safe; beware of the roller towel.

FIRE !

Most fires are caused by lack of care. Scraps of material—wood, paper, cloth, etc.—should not be allowed to accumulate.

Oily waste or rags should be kept in metal waste cans with self closing covers.

No smoking! Clean up or report conditions which may cause fires.

Fundamental Chemistry in Paper Making*

By J. L. A. MACDONALD, D.S.O., D.Sc.

The Present Position of Chemistry in Papermaking.

What part does chemistry play in the paper industry to-day? Is there a field for fundamental chemical research, or is there none?

It is true that chemistry is doing much for papermaking, but it is no less true to say that the industry is a realm largely unexplored by the chemist, mostly for lack of incentive or opportunity. It is only natural in an industry that that side of it which is of obvious importance should receive a greater part of the attention of the manufacturer. In papermaking, the principal process being the formation of the web, it is only to be expected that the lion's share of thought and energy should be devoted to development of the engineering or physical side of the industry. This is just and right, but it is altogether unfortunate that the latent possibilities of other sciences should have been overlooked as they undoubtedly have been.

The view is commonly taken that the practical application of chemistry is limited to those cases in which the products are the final result of a series of more or less well-defined chemical reactions. But this is far from being the case. In practically all industries chemical knowledge is of value for purposes of control, and it is probably the case that the causes underlying the majority of the troubles, giving rise to customers' complaints, can be traced in most industries to a "chemical" origin.

There are many directions in which chemistry is of obvious importance in the paper mill. For example, the benefits which result from a knowledge of the "chemical quality" of incoming raw materials as ascertained by analysis are probably so well known as to require little comment. The production of caustic soda and resin size involve processes of chemical change, and even the preparation of alum, bleaching powder, and dye-stuff solutions lose nothing from the attentions of a chemist.

The digestion of rags and esparto, and the bleaching of these and other fibres are chemical processes which have received a considerable amount of attention from the mill chemist, but most of the investigation has been of a directly technical kind, and little progress has been made towards advancement of our knowledge of the ultimate mechanism of the changes which are involved. Up to the present time it has apparently not been worth while to investigate these processes more closely, probably because a sufficiently good result is got without difficulty or much attention to detail. Day by day it is becoming forced upon us more and more clearly that existence upon our export trade. Competition is rapidly increasing in our foreign markets, and it therefore becomes more and more important that no avenue which may lead to the production of cheaper or better quality goods should be left unexplored. I suggest that the papermaker again give his careful consideration to the advisability or otherwise of instituting further scientific inquiry into the many unsolved and controversial problems of digestion and bleaching.

Chemistry recognises two principal types of matter. Matter which cannot be split up into anything simpler except by chemical agency it regards as a compound. Typical examples of such compounds are cane sugar and common salt. On the other hand, two or more "compounds" may be so intimately mixed together as to present all the external characteristics and qualities of a pure simple compound, but yet such material may be separated into its constituent compounds by physical means. Such matter is described as a "mixture." Compounds are built up of atoms of two or more different kinds, the proportion in which the several kinds appear being quite definite for each particular compound. One of the most important functions of chemistry is to ascertain what atoms are present in a compound, and how they are linked up together one to another, since it is these two conditions which largely control the chemical behaviour of the compounded substance.

A very common method of chemical inquiry is therefore to ascertain what is known as the "constitution" of the substances involved. By the knowledge so obtained the chemist is often able to exert better control over the chemical activity of the substance and so produce better yields, purer substances, and new products.

For these reasons it is not a little surprising that there has been so little organised attempt to elucidate some of the many problems of papermaking on a "constitutional" basis. It stands to reason that unless the manufacturer knows something about the chemical structure of the compounds he has to handle, he must be to some extent handicapped in carrying out the methods of his process. Such investigations relating to the atomic structure or constitution of material are typical examples of fundamental research, and in them we have a field of inquiry holding much promise of profit for the investigator.

The basis of a sheet of paper is a film of innumerable vegetable fibres; many kinds of fibres are used and we are content to include them all in the comprehensive term of "cellulose"; it is recognised that different fibres possess different papermaking properties, but we have no very clear idea why this should be so. Here then, surely, we have an outstanding example of a case where investigation into the constitutional character of of the different celluloses should prove of prime importance.

Consideration of the import and production figures only serves to emphasise this view. In 1919 over 1,000,000 tons of crude fibre were imported in various forms, which it is calculated represented at least 600,000 tons of "cellulose." The unofficial estimate of the Papermakers' Association of the pre-war production of paper in Great Britain and Ireland is 1,092,000 tons a year, which means that, roughly, 750,000 tons of "cellulose" are put through the papermaking process annually. Clearly it should be worth while to know something more about the chemical constitution of the celluloses.

The Fundamental Chemistry of Cellulose.

It not infrequently happens that the chemist inquiring into the constitution of a compound finds it more convenient to turn his attention to derivatives of the parent substance in the first instance. Knowledge may often thus be gained which is sufficient to enable the investigator to surmount obstacles which previously barred his direct attack of the problem. Information upon the chemical nature of derivatives of the celluloses is, therefore, also likely to prove of no little value to the papermaker, in spite of the contention that the

* Read at the Edinburgh meeting of the British Technical Section.

basis of paper is cellulose, and not its derivatives. Such knowledge must particularly appeal to the esparto papermaker, because the first step of his process is the removal of the non-fibrous elements of the raw material by a somewhat drastic chemical treatment. It is commonly accepted that if the appropriate amount of caustic soda be used, a sharp separation of the non-fibrous portion by a process of solution takes place, leaving the true fibrous cellulose unattacked. Let us see what light the present state of our knowledge of the chemical constitution of cellulose throws upon this problem.

A considerable number of years ago, Ost and other chemists formulated the opinion that cotton cellulose consisted of a condensed aggregate of grape sugar (glucose) molecules. This conclusion was hardly justified by the experimental evidence available, and the question has recently been reopened by Irvine, who has succeeded in preparing a large proportion of glucose (85 per cent. theoretical on above assumption) from cellulose with full proof of its identity (as glucose). This work received further confirmation no later than last month (Williams). Esparto cellulose differs in several respects from cotton cellulose, a noteworthy feature being that it is not nearly so inert towards chemical change, but there are reasons for believing that glucose or some closely related sugar forms a constituent part of the molecule. It is therefore of some interest to notice the behaviour of sugars towards alkalis such as caustic soda, as it is not unlikely that any reaction between the two may have considerable bearing upon the removal of the non-fibrous materials of esparto grass by caustic digestion. The reaction between alkalis and sugars is a most remarkable one, but it is of so complex a character that I can make no attempt to describe it here. Let it suffice to say that in a long series of fundamental researches spread over his whole life Nef demonstrated that if caustic soda be allowed to react with any one sugar, profound changes take place, and so deep seated is the reaction that more than two hundred different chemical compounds are produced. This is indeed a startling result, and makes it clear that a most careful watch requires to be kept upon the alkaline digestion of all cellulose fibres. In point of fact, we know that celluloses are profoundly modified by the action of alkalis, but it is far from being appreciated in the industry that, not only may serious losses of cellulose take place from this cause, but also that the modifed cellulose so formed may produce effects which persist even in the finished sheet. Further information of the precise effect of alkalis upon cellulose can only be obtained by carefully guided fundamental research, but it is to be devoutly hoped that results may be obtained in a shorter period of time than has been required to establish our present knowledge.

A further problem of paramount interest to the esparto papermaker is the utilisation of the fifty per cent. so-called "non-cellulose" matter present in the grass.

To-day we are content to look upon this as a necessary evil, and in some cases to make use of it to preheat the lye for evaporation or to generate steam. But it seems a pity in a country like our own, which is rich in coal, to use a material which we have taken the trouble to bring all the way from Africa merely as a fuel. Many attempts have been made to extract useful products from this material, but none have proved altogether successful. In the discussion on a paper recently read by Raitt in London on the subject of Bamboo papermaking in India, Sindall raised the question of Rinman's patented method of treating the soda lyes, which apparently aroused some interest. By this method the lyes are concentrated and finally heated in presence of lime, whereby acetone, methyl alcohol and methyl-ethyl-ketone are produced and distil over. These are valuable products, and if obtained in sufficient quantity, might make the process a practical one. I do not think, however, that the problem will be satisfactorily solved as far as esparto lyes are concerned until much fundamental work has been done upon the chemical character and constitution of the bodies composing the "non-cellulose" portion of the "complex"—esparto grass. Once the chemical indentity of these components has been proved, then we shall be ready to go ahead with the recovery of useful by-products on sound scientific and practical lines.

I trust I have produced sufficient evidence to justify my contention that the prosecution of fundamental chemical research merits the early attention of the papermaker. Germany, the United States of America, Canada, and Japan are working tooth and nail to develop the scientific side of papermaking; it is going to be a race for the markets of the world and the winner must inevitably be the vendor at the lowest price and of the highest quality.

A Note on the Chemistry of the Beating Process.

The reactions which take place in the beating engine are conveniently considered under four headings—first, the separation of the fibres by the action of the roll, whereby felting quality is obtained; secondly, the cutting of the fibres to the required length, again by action of the roll; thirdly, the incorporation of water with the fibre, which produces "wetness" or hydration; and, lastly, the treatment of the fibre with resin soaps and dye-stuffs, by which means sizing and colouring the web are effected.

The first three of these reactions are commonly regarded as the result of the mechanical action of the roll and are therefore deemed physical processes, while the fourth is usually considered to depend upon the collodial character of cellulose and therefore to be within the domain of colloidal physics. It is notable that chemistry as such is not held to play any very important part in beating reactions.

If we trace the development of the beating process proper, apart from sizing and dyeing, we find that progress has been in direct proportion to development in beater design, at all events within recent years. As a result, we have many excellent types of highly efficient beaters to choose from, but at the same time we have made comparatively little progress in our conception of "cause and effect" in the beating process.

It therefore appears to be of interest to consider some recent fundamental work and to examine what influence it may have upon our ideas of beating.

In the short space of time available it is not possible to attempt a review of recent inquiry, and I have, in consequence, selected two lines of investigation which well serve (1) to draw attention to the possible value of fundamental research, and (2) as a reminder that beating problems are not necessarily confined to the mechanical sciences.

The first case to which I wish to refer has reference to the mechanism of the sizing process. All papermakers at some time or another encounter mysterious sizing difficulties; either the sheet suddenly becomes too hard or, what is more usual, the hardness no less

suddenly drops away, and nothing that is done seems to have any beneficial effect.

I do not propose to enter into a discussion of the underlying mechanism of the sizing reaction, but I believe all will agree that it is far from being properly understood. With regard to methods, each papermaker has his own preference, but, on the whole, today acid sizes seem to be the most popular. That is to say, sizes which contain a relatively large proportion of free resin are in a majority. The recent work of Dr. Sieber, of Kramfors ("Zellstoff und Papier," 1921, p. 15), is of special interest, since this investigator has re-opened the problem by a study of the behaviour of colloidal suspensions of pure resin, particularly with regard to the effect upon them of aluminium sulphate (—papermarker's "alum"). The details of the work can be obtained from the original accounts, but, briefly put, the experimenter examined the effect of the addition of the aluminium sulphate in increasing amounts upon the resin suspension after the lapse of a certain period of time. Dr. Sieber finds that the addition of very small amounts of aluminium sulphate produces no effects; as the quantity added is increased, complete precipitation of the resin occurs, but, on further increasing the quantity of aluminium sulphate added, no effect is produced, while, on still further increasing the amount of alum, complete precipitation again takes place. (See translation, Pulp & Paper, Oct. 13, 1921.)

The author puts forward one explanation which at least serves as a working hypothesis: those interested should consult the original paper. The author also examines the effect of the salts which commonly produce hardness in water with somewhat similar results, and as the result of experiments conducted to determine the effect of several salts jointly, the conclusion is reached that hard waters may produce precipitation without the quantity of each individual salt present exceeding the minimum (critical) value. On the other hand, he finds that a suspension of pure free resin is stable to even very hard water, which is not the case with the ordinary resin "milks" as used in the paper mill. From further considerations the author argues that the object of the papermaker should be to obtain the largest possible surface area in the free resin portion of his size, which means that the smaller the particles of precipitated resin are, the harder will the sizing be.

Experiments were also carried out to determine how resin is affected by cellulose fibres. Although not directly conclusive, absorption appeared to take place on the boundary surface of the fibre, but the interesting fact appears that the storage of free resin on the fibre does not give the fibre any ink-resisting properties.

Experimental work is apparently still in progress, and one looks forward with interest to the further results which Dr. Sieber may obtain. In the meantime it is too early to attempt any criticism, but it does not seem too much to hope that this fundamental research will lead to results which may do much to clear away the uncertainty and ignorance which still surround the engine-sizing process.

Hydrocellulose and Oxycellulose.

The second instance to which I wish to draw attention concerns our third subdivision of the beating process, namely, the production of "hydration" or wetness.

The view is usually held that hydration is the outcome of the combination of the cellulose with water as the direct result of the mechanical bruising action of the roll. It is well known that certain types of colloidal substances possess the power to take up water in semi-combination to a remarkable degree, and as applied to the beating problem in question such a hypothesis offers a convenient explanation of the production of wetness.

Of considerable interest in this connection are the investigations of Schwalbe. Professor Schwalbe has carried out a long series of researches extending over many years upon the decomposition products of celluloses (particularly wood-cellulose). His results lead him to the conclusion that it is not the cellulose as such which is the direct cause of "wetness," but that products formed by the chemical decomposition of cellulose are the reactive bodies in the production of hydration. This investigator concludes that hydro-cellulose and oxycellulose are chiefly concerned in the process, and he seems to incline to the view that the latter is all-important, since he has taken out a German patent (D.R.P, 1920, 303,305) for the production of wet stock, the basis of which is the formation of oxycellulose by chemical agency prior to the beating proper; by this means he achieves very rapid hydration.

It is important to note that the chemical constitution of hydrocellulose and of oxycellulose is unknown, and also that their relationships one to another and to the parent cellulose are not properly understood. Professor Schwalbe, realising the importance of gaining information upon these points, has undertaken further fundamental inquiry into this problem, and his published results are of considerable interest.

We may also note that on the other side of the Atlantic the hydration problem is also receiving attention. In U. S. A. Seibert and Minor, as the result of their researches upon chemical reactions in the beater, have also reached the conclusion that a substance which they designate "hydrocellulose" is the real medium by which hydration is effected.

We have therefore to face the fact that two independent authorities have both reached the same conclusions—firstly, that hydration of cellulose is not the simple combination of the cellulose with water which is usually assumed, and, secondly, that the effect of the mechanical bruising action of the roll is to produce profound chemical changes of a somewhat unexpected character.

It is too early to attempt useful criticism of this view, but it would appear that in the near future not only may we have to modify seriously our views of the beating process, but that the distinct possibility exists that we may before long have radically to alter our beating practice.

The important point about these investigations, upon which I wish to lay special emphasis, is that they are essentially the outcome of fundamental experimental research. Much further work of the same character requires to be done before technical results can be expected, but the interesting fact is patent that fundamental chemical research may find application in a totally unexpected direction.

Conclusion.

Germany, the United States and Canada are actively prosecuting chemical inquiry into papermaking problems.

If the British paper industry is to maintain its place in the world's markets, it would appear unwise to neglect this avenue to progress.

Prospects Brighter in Belguim

Belgium, September 1921.

The general crisis, which since nearly one year has been causing the utmost inactivity in practically all branches of business, has not been without badly affecting also the Belgian Paper Industry.

The importance of the decline is expressed in the following table of total imports and exports of pulp, paper and board, for the first half of this year, as compared with previous periods since the armistice.

	Imports (Net in gross tons)		Exports	
	6 first months	Whole year	6 first months	Whole year
Wood Pulp —				
1919	14,576	54,979	....	1,475
1920	57,661	117,235	7,388	15,681
1921	15,091	....	2,288	
Wall paper —				
1919	972	1,889	1	533
1920	1,183	2,002	1,033	2,240
1921	1,006	....	1,074	
News Print —				
1919	4,083	8,155	15	99
1920	2,721	5,406	109	960
1921	1,710	....	1,529	
Board and non-denominated paper —				
1919	5,175	15,226	426	3,523
1920	12,604	21,714	8,187	24,612
1921	6,230	....	10,290	
Totals —				
1919	10,231	25,266	442	4,156
1920	16,509	29,124	9,331	27,813
1921	8,947	....	12,894	

The imports of wood pulp for the six first months of 1921 amounted only to 26 per cent of those for the corresponding period in 1920.

In detail they were as follows for the first six months of 1920 and 1921 respectively, in gross tons:—

Imports of wood pulp (total), 57,661 (1920), 15,091 (1921); from Finland, 1,297, 1,286; Germany, 267, 654; Norway, 31,273, 8,436; Sweden, 22,698, 3,241; other countries, 2,125, 1,472.

In the quantities "From other Countries" are included 347 and 214 tons, for the comparative periods of 1920 and 1921 respectively, exported by Canada.

As only relatively small quantities of pulp are manufactured in Belgium, the amount of the pulp imports constitutes a more or less exact indication of the degree of activity in the paper trade. In the present case, it ought to be taken into consideration, that the past year left an excessive surplus of pulp.

Imports and exports of board and paper were as follows, in gross tons, for the first six months, 1920 and 1921 respectively:—

Wall Paper.

Imports (total), 1,183, 1,006; from France, 378, 224; from Germany, 188, 602; from Great Britain, 534, 77; from Holland, 79, 85; from other countries, 2, 16.

Exports (total), 1,033, 1,074; to France, 691, 633; to other countries, 342, 440.

News Print —

Imports (total), 2,721, 1,710; from Germany, 31, 697; from Holland, 2,365, 951; from Sweden, 189, 20; from other countries, 135, 41.

Exports (total), 109, 1,529; to France, 68, 746; to Great Britain, ..., 579; to other countries, 41, 203.

Board and non denominated Paper —

Imports (total), 12,604; 6,230; from France, 1,128, 524; from Germany, 3,823, 3,412; from Great Britain, 2,398, 353; from Holland, 2,501, 1,286; from Norway, 564, 34; from Sweden 1,191, 326; from other countries, 996, 292.

Exports (total), 8,187, 10,290; to Argentine, 34, 568; to France, 3,813, 1,539; to Great Britain, 2,235, 3,644; to Turkey, 51, 404; to United States, 121, 434; to other countries, 1,213, 3,123.

In "to other countries" are included exports to Argentine, Brazil, Egypt, British India, Spain and Uruguay, amounting respectively to 0.3, 0.05, 1.1, 0.9, 0.2 and 0.03 per cent for 1920, and 2,7, 1.1, 2.0, 3.4, 1.7 and 2.5 per cent for 1921, of the total exports.

The fluctuations in the imports and exports during the comparative periods, dealt with in the preceding tabulations, are condensed in the following statement:

Wall paper, imports decreased 14.9 per cent; exports increased 3 per cent. News Print, imports decreased 37.1 per cent; exports increased 13.02 per cent. Board and non denominated paper, imports decreased 50.5 per cent; exports increased 27.4 per cent.

Compared with the average imports for the whole year of 1920 the figures are as follows:—

Wall paper, imports increased 0.5 per cent; exports increased 4.1 per cent; News print, imports decreased 36.7 per cent; exports increased 218.4 per cent. Board and non denominated paper, imports decreased 62.7 per cent; exports decreased 7.8 per cent.

In fact, the import and export trade has been ruled for a great deal by the exchange factors and it is worth mentioning that imports have decreased from those countrits with a favorable exchange (Great Britain, Holland, Sweden and have increased from countries with a depreciated exchange (Germany) while on the other hand exports have been principally directed to countries with a favorable exchange.

Exports to France came practically to a stand-still through two successive increases of the import duties viz. in March and July.

Then, since the second half of 1920 accumulated stocks of pulp and paper, purchased at high prices, have been proving a serious impediment to normal transactions and under the influence of unfavorable circumstances — German cutting of prices, lack of confidence of buyers and their destructive policy of holding back in the falling market in the expectation of progressive reductions to an approximately pre-war level — owners have had to dispose of them at heavy sacrifices, absorbing in most cases the better part of earlier profits. A typical illustration of such financial adversity is the following: the profits of a certain paper-mill amounted for the year 1919 to 601,729 frs. and 418,556 frs. were distributed in dividends; the profits for the year 1920 amounted to 3,294,856 frs., and after provision in the evaluation of stocks of raw materials through a fall in prices, only 266,906 frs. were distributed in dividends.

Some temporary revivals were noticed after the London Reparations Conference. The prospect of the application on Germany of "sanctions", stopped for some time the imports from this country, prices grew firmer, buyers were more decided and even a very satisfactory export trade, especially with England, occurred; but in no one of these periods of recovery did the output exceed more than 60 per cent of the average paper production in 1920. Unemployment has not been very extensive,

(Continued on page 1078)

The Structure of Cereal Straws

By FRANCIS E. LLOYD, F.R.S.C. McGill University.

(Concluded from last issue.)

Leaf sheath, near ligule: wheat = oat = barley; rye
near base: wheat; rye = barley; oat.

Wheat has the stiffest leaf sheath throughout its length, while rye and oat show the greatest change from base to apex. When all is said however, from the point of view here taken, this feature is of perhaps least value.

There are similar but not so great differences in the thickness of the cell walls of the epidermis in different parts of the internode, coupled with the absence, at the base, of stomata and stomatal zones. In all the straws, the thickness of the walls decreases toward the base, their sinuosities are entirely absent, and their caliber becomes much reduced. Indeed, the difference in the lower part of an internode are so slight as to be practically negligible, although, in unmacerated epidermis, the oat can be distinguished from the others by the thicker walls. The series are, in order of thickness of cell wall as follows:

Lower internode: near top: wheat (9 microns); oat (6 microns) = barley = rye.
near base: oat (3-6 microns); wheat (2-3 microns = barley = rye.

The width of the epidermal cells of the stomatal zones affords an additional criterion of distinction which is of some help. The following measurements were made on five different leaves and five different stems, the leaf specimens taken near the ligule, and from the internode correspondingly near its apex. About 150 measurements of each species were made, each measurement being the total width of from five to twelve cells, taken transversely. Two sets of measurements were made several days apart, and they were found to check, this also in the case of the stomatal measurements just beyond.

Minimum, mean and maximum width of epidermal cells (with wavy outlines) of stomatal zones, (in microns):—

	Leaf sheath	Stem
Barley	16 - 20 - 25	15 - 17 - 18
Oat	25 - 27 - 31	19 - 21 - 23
Rye	22 - 24 - 28	18 - 20 - 22
Wheat	24 - 27 - 32	20 - 21.5 - 24

These measurements may not of course be taken as a single expression of unvarying size for each kind of straw, but they appear however to express with fair accuracy the relative values of the different kinds. The order of the series for both leaf and stem is therefor: Wheat; oat; rye; barley, there being less difference for the stem than the leaf. In the former the differences are too slight for practical purposes, and therefor can scarcely be used to advantage.

Measurements of length of the epidermal cells appear to be of less value that those of width. Wiesner (1900) gives the following dimensions determined by him.

	Length (microns)	Width (microns)
Barley	103-224	12-14
Oat	186-448	12-17
Rye	86-345	12-16 (14)
Wheat	152-449	18-24

(14) Hoehnel gives 36-90 as Wiesner's figures (from Wiesner 1867). In Wiesner 1900 they are given as 12-16, as above quoted.

Weisner does not tell us what epidermal cells they are that he measured, and it has become quite evident from my own observations that it is important to know this. That his data are of restricted value appears at once when they are compared with the following made by me on the epidermis which yielded my own measurements of cell width, given above.

Epidermis.— Length of cells in microns.

Species	Stem (lower internode) Upper part	Lower part	Leaf-sheath
Barley	39-270	450	30-186
Oat	45-405	240	225-2100 (15)
Rye	30-270	630	45-300
Wheat	60-300	585	30-330

(15) The epidermal cells with straight (non-sinuous) walls are by far the longest, those having lengths of 1,000 to 1,500 microns being frequent.

The length of the cells varies very much with the position, the shortest occurring in the vertical series which include the stomata, the longest in the non-stomatal zones, where the outlines are either less wavy or not at all. In macerations, the latter might easily be overlooked. At all events, with such wide limits, and we note in passing especially the oat, the application of these measurements would have only an equivocal value.

The stomata show very considerable differences in size when the transverse and longitudinal measurements are taken separately. Measurements of 100 to 200 stomata taken from five specimens of upper part of leaf and of a lower internode gave the following data.

Measurements of stomata (in microns).

	Leaf sheath		Internode	
	Length	Width	Length	Width
Barley	50	26	47	26
Oat	63	25	55	29
Rye	56	29	58	31
Wheat	56	37	56	34

It has been seen that wheat has by far the widest stomata* while in the leaf sheath the oat has the longest. There is however considerable variation in the size of the stomata, especially from different regions of the organs which carry them. This offers a difficulty of course in view of the fact that in macerations the stomata from these regions are mixed together. The variation due to this alone is indicated in a general way by the following comparative measurements.

Stomata of internode.

	Basal internode (upper end)		Terminal internode	
	Length	Width	Length	Width
Barley	45	33	48	33
Oat	60	45	55	33
Rye	57	36	60	30
Wheat	55	45	55	33

Stomata of leaf sheath.

	New ligule		Near base	
	Length	Width	Length	Width
Barley	43	24	51	19
Oat	60	27	49	30
Rye	54	24	62	31
Wheat	54	35	59	35

The discrepancies which are apparent in the above tables both for the stomata in similar regions and for different regions teach us that measurements must be

(*) The width does not include the thickness of the wall of the two adjacent cells. The length is "over all" — that is, includes the total thickness of the end walls.

used with caution and, beyond a very general purpose of distinguishing between one straw and all the rest, only when a sufficient number of measurements can be made, a caution which applies also to the other measurements given above.

Keys based upon the foregoing characters.

A. Epidermal cells with strongly undulating walls, at least toward the sides of the stomatal zones
.. ..leaf-sheath epidermis upper part.
Walls along the middle of stomatal zones thin and straight .. ..oat
Walls of nearly the same thickness and degree of sinuosity through the whole stomatal zone.
Sinuosities very irregular, stomata very broad (about 35 microns) crown cells present .. ..wheat
Sinuosities regular, crown cells absent.
Stomata with average width of about 50 microns .. ..barley
Stomata wider, average width of about 56 microns .. ..rye.

B. Epidermal cells with straight, thick and only slightly undulating walls, or straight
.. ..epidermis of internode.
Crown cells present, stomata very wide (34 microns).. .. ..wheat
Crown cells absent.
Wall straight .. ..oat
Walls slightly undulating.
Cells 15—18 microns wide, walls very slightly undulating, stomata small .. .. .barley
Cells 18—22 microns wide, walls slightly undulating, stomata large .. .. rye

It must be admitted to be difficult to apply the above criteria, but they seem to be the only ones available. It is more difficult to distinguish rye and barley, if one makes use only of the above marks, though easy to separate them from oat and wheat. The following paragraphs will however show that rye and barley are easily separable by other characters.

The preceding description of the epidermis does not include the epidermis of the inner face of the leaf sheath, that namely which lies in contact with the surface of the stem (internode). Although in most regards the structure is very uniform in all the straws there are certain differences which stand out prominently. In general, the walls of the long cells are very thin and straight, there being no suggestion of undulations, and they are very similar to each other in all the kinds of straw. The stomata and the dwarf cells however are distinctive.

The dwarf cells in wheat and rye are for the most part in the form of minute trichomes (figures 29 e-f). They are three or four times as numerous in rye than in wheat, and are so small that it requires either microscopic observation, or a sense of touch equal to that of the tip of the tongue to detect them. For this reason the latter method has been indicated in a previously given key. They are absent from the oat.



Figures 30-33. — Maceration products of barley, oat, rye and wheat resp. x 23.

The stomata in rye and wheat (figure 29, c, d) are similar in that the guard cells taken together, are as broad as the long cells where they articulate with the guard cells, while in the oat and barley (figure 29, a, b) they are usually much narrower. In barley the fore-pore (the vestibule, or outer entrance) is small and well marked, while in oat it is not. Summarizing in the form of a key we have a

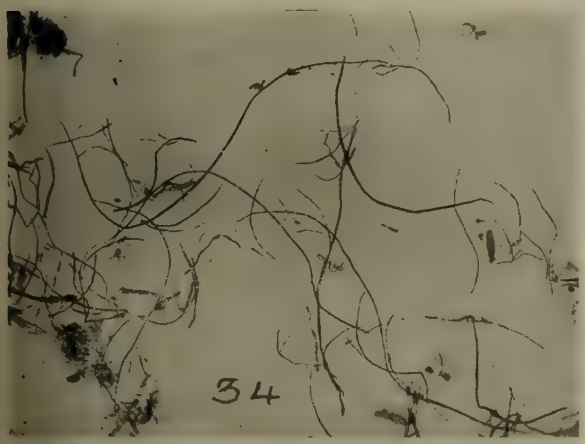
Key based on the characters of the inner epidermis of the leaf sheath.

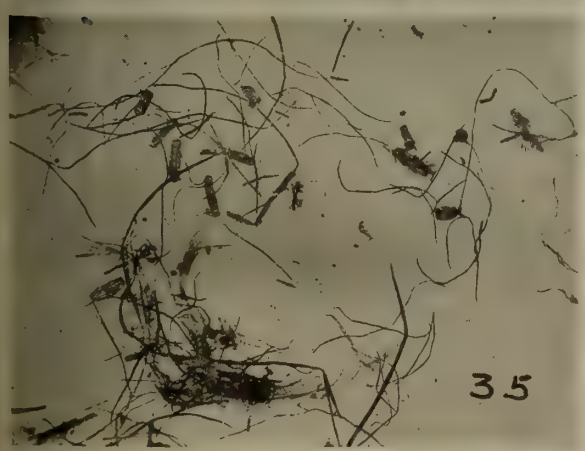
A. Guard cells as wide as long cells. Minute trichomes present:

Stomata large (60—70 microns long) . . . .wheat
Stomata small (about 50 microns long). . . rye

B. Long cells wider than the guard cells; no trichomes in oat.

Vestibule short and narrow, rectangular (figure 29a) . . . . . barley
Vestibule nearly as long as the guard cells (figure 29b) . . . . . oat





Figures 34-35. — Fibers and other maceration products from straw-pulp papers. Figure 34, oat; figure 35, wheat. x 20.

In studying the stomata in the inner epidermis of the leaf sheath, it is necessary to observe the precaution of excluding those along the thin, papery margin, as here they are narrow and hardly characteristic.

In evaluating these measurements, too much weight must not be attached to the averages. The short and slender fibers (6-10 microns in diameter) are reduced in number—at least they are not to be readily found—in bleached pulp, so that the character of the pulp is determined by the survival of the longer and the thicker (10-30 microns) fibers.

2. The mechanical tissues (fibers). (Figures 30-33).

The mechanical tissues are made up of bast fibers composed of single cells with thick walls, and gradually tapering toward either end. The ends of the fibers are usually abruptly truncated by an oblique wall, or may be very blunt or even bifurcated.

There is little uniformity in length, as can be judged by inspecting the figures herewith (figures 30-33), and the thickness of the wall varies accordingly.

Table of fiber length (in millimeters).

	Number of counts	Stem max.	Stem min.	Stem ave.	Leaf sheath max.	Leaf sheath min.	Leaf sheath ave.
Barley	40	1.5	0.3	0.9	1.7	0.5	1.0
Oat	110-40	4.6	0.6	1.8	1.9	0.5	1.2
Rye	40	3.3	0.7	1.8	3.9	0.6	1.3
Wheat	5--20	2.4	0.7	1.6	1.7	0.5	1.2

In making the above measurements, certain long cells found in the leaf sheath were purposely avoided. These are the cells (some of which are marked 1, in figure 25), which occur along the ventral (upper) edge of the bundles and are especially long and thin walled, the walls with minute pores. Preparations were made so as to include these fibers only, excluding as far as possible the fibers from between the bundles and the lower epidermis. The lengths of the longer isolated cells (some are quite short) are:

Barley	about 1.7 mm.
Oat	5 to 8 mm.
Rye	about 4 mm.
Wheat	2 to 4.5 mm.

That is to say, these fibers, or rather fiber-like cells, are roughly twice as long as the true fibers in barley, and three times as long as in others, reaching the greatest length in the oat. They are rather readily found in paper pulp, forming but a small fraction of the whole.

An interesting and theoretically important question always comes up in regard to fiber length and its relation to position in the plant . Specifically stated, it is to be expected that the long internodes will have longer fibers than shorter ones? or will taller straw have longer fibers than shorter ones?

Rye is the tallest straw. The average length of fiber is little if at all greater than in wheat and oat. Measurements of fiber length for the terminal internode in rye, this internode being the longest, showed that the longest fibers were about 1.4mm long, whereas in the lowest basal internode they were 2.3mm long. There seems therefore to be no direct relation between length of straw and length of fiber.

It is of course very difficult to apply fiber measurements to pulped straw, since the working and the softening effect of the chemicals used result in bending and twisting of the fibers (figures 34 and 35). For critical determinations therefore, it is on the whole advisable to depend on the characters afforded by the epidermal cells.

These, together with wood vessels (tracheids) and parenchyma cells are always to be found in varying numbers, and more or less distorted, according to the length and character of the chemical treatment which may have been used. But of all the elements, the epidermal cells are the most resistant, and hold their original characters the best on account of their thick walls.

3. Xylem, phloem, and associated cells; parenchyma.

The impression is scarcely to be avoided that the structure of the straws of the various grains is remarkably uniform, a result to be expected from what

we know of the general homogeneity of the group which they represent. This is especially true of the tissues which we have not examined in detail for differences, namely the tissues of the fibro-vascular bundles and parenchyma. Only the most general statements may be made with safety, and these do not lead very far. For example, we may say that in general the stature of the cells of all tissues is in barley (figure 30) less than in the other grains, and we have seen evidence of this in the measurements already given. Beyond this, only extreme minuteae, such as the shape and size of the pits in the wood (xylem), seem to offer any appreciable differences, and these are of very uncertain value. It would seem that, from the practical point of view, with the purpose in mind of seizing on differences which can be made use of for identification without too great difficulty, the features which have been presented above will meet the need.

The Chaff, (Glumes and palets.)

In the preceding account there has been no attempt to give any description of the chaff. This term is a loose one and includes two kinds of chaff, that which immediately encloses the grain (grain-chaff, palets) and that the glumes which subtends the grain with its grain-chaff. This distinction may be readily understood by a comparison of oat and wheat. In the oat the grain-chaff (palets) permanently invests the grain, so that after threshing, the "grain" consists of the grain proper plus its chaffy covering of two parts, one larger (outer palet) inclosing the grain, and the other smaller, (the inner palet). The grain of wheat, on the other hand, shells out of the grain-chaff, in which respect rye behaves similarly. Some varieties of barley are like the oat, differing only in the fact that the grain-chaff is firmly attached to the grain. (Harlan, 1918). The structure of these various kinds of chaff differs very widely, so that a full account of all the details would occupy much space. We may note particularly the thin papery character of the inner palet in wheat and rye. Inasmuch as the contribution of chaff to straw is in any event very small, such an account is unnecessary. At the same time, since a certain, if small, amount of chaff is bound to remain attached to straw, and hence may be found in paper, although in exceedingly small proportion, it is advisable to indicate the general character of the structures which may be found.

In addition to the chaff, the rachis or that portion of the steam which bears the grain, will contribute a similarly small proportion to straw pulp. The rachis presents equally special conditions of structure, and would call for much detail of description. For this reason also, the following summary of structural characters is confined to very general terms.

Barley. The chaff consists of slender loose parts (glumes) and the bead of the outer palet (lemma). Both palets would be included in straw of hulled varieties. Numerous very thick walled trichomes, strongly oblique in form, giving the characteristic roughness of the head of barley. The trichomes of the inner or upper face of the beard are small and thin walled. Cells resembling crown cells occur near the base of the glumes. Crown cells occur locally in small numbers near the apex of the outer palet (lemma), which when adherent, contribute but little to pulp.

In all the cereals according to Hohnel (1875) the hypodermal cells (bast cells immediately beneath the epidermis) of the thick palets have teeth which articulate with corresponding depressions in the epidermal cell walls, and I have verified this. I have not found this condition in the beard.

Oat. Chaff consisting normally of glumes only. These are thin and leaf-like. The epidermal cell walls are wavy except in the thin papery marginal regions, the cells themselves much shorter than in the leaf. The bearded varieties will contribute trichome cells.

The palets of unfilled grain and of course an occasional filled grain will find their way into pulp. The epidermis is very sinuous and thick walled. There are a few crown cells, which are evidently undeveloped trichomes. They are distinct in appearance from those of wheat because of their somewhat irregular or oblique form. They are quite infrequent. Short, very thick walled trichomes on the outer palet and, along the fold of the inner palet, very numerous trichomes which can be distinguished by their lack of obliquity, standing out as they do at right angles (or nearly so) to the folded edge whence they spring.

Rye. Glumes and palets, with beard, constitute the chaff. The glumes and outer palet are similar in structure, characterized chiefly by large thick walled curved trichomes placed along the fold. The inner palet papery, the epidermal cells thin walled except toward the base, and thin walled crown cells numerous. These are readily distinguishable. The walls of the epidermal cells, especially those between the stomata very sinuous.

Wheat. Glumes and palets are the chaff. Very thick walled epidermis and trichomes characterize the glumes and outer palet. The thin papery margins of the inner palet has numerous rather slender trichomes arising from cells, which, as such, are very numerous and have the same appearance as those of the leaf.

The dwarf cells in all the foregoing generally consist as elsewhere of a larger crescentic thinner walled cell and a smaller very thick-walled cell. More exceptionally the dwarf cells occur singly, especially, for example, in the epidermis of the beard of barley. These do not in any event afford distinguishing characters.

It will thus be seen that crown cells, which would occur only in wheat straw pulp if the chaff were excluded, may otherwise be found also in oat and rye straw pulp. Even barley is not certainly excluded on this score. Trichomes, which would be found only in rye and wheat straw pulp, chaff excluded, may otherwise be found in all. The chief purpose of these additional notes therefor is to show the necessity of close study in the event that strict identification is desired.

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FALL PAPER CONFERENCE PLANS.

Chicago, Ill., Oct. 17.—Following the decision of the Salesmen's Association of the Paper Industry to hold the semi-annual meeting of that association during the Fall Business Conference of the paper industry at Chicago, the Chicago members of the association have been rushing plans to make this a notable meeting. The date has been definitely set for Nov. 1 at the Drake Hotel, and following the men's meeting there will be entertainment which will include the ladies attending the convention.

President H. H. Reynolds of the Salesmen attended the preliminary meeting with twelve salesmen of the Chicago district, including J. L. Fearing, vice-president for the Chicago district, and George K. Gibson, former president.

All meetings of the Salesmen's Association will be held in the Grill Room, and the meeting will be called to order promptly at 11 o'clock, instead of 11.30 as originally suggested. This will be the business meeting of the association, and at 12 o'clock Dr. Craig Stewart, the chaplain of the Association, will make his address. At 12.30 there will be a luncheon, followed by a formal program at 2 o'clock. R. S. Kellogg, secretary of the News Print Service Bureau, will discuss import conditions, and other speakers will be selected to discuss the financial situation, and the advertising and general business conditions. At 3.30 the meeting will adjourn for the social feature, which will be a reception to members and their ladies. There will be music with dancing until 5.30 or 6 o'clock.

This is the latest development of the plans for the Chicago business conference which now promises to be of the greatest importance to the industry. Many of the speakers have been selected, and plans are going forward rapidly for the closing of details for the convention. The holding of the symposium in the spring, as a cross section of the industry from the viewpoint of the various manufacturers, was met with such favor, that it was decided to extend the idea to the entire industry for the fall conference with the manufacturers, merchants and consumers all represented.

The merchants' side of the program has been completed by the acceptance of the invitation to speak by O. A. Miller, of Columbus, O., President Edward F. Herrlinger, of the National Paper Trade Association, having been announced earlier as the other of the two merchants on the program.

The combined programs follow:

American Pulp and Paper Association.

Program of the Third Fall Business Conference of the American Paper and Pulp Association. The Drake Hotel, Chicago, Ill. General subject: "The Paper Industry as seen by manufacturer, merchant and consumer." Thursday, November 3, 1921.

10.30 a.m.—General session of American Paper and Pulp Association. Addresses by representatives of manufacturers of paper, merchants and consumers.

1.00 p.m.—Joint luncheon with National Paper Trade Association. Addresses by two leading business men on the Paper Industry and business in general.

Program of Affiliated Associations of the Paper Industry during Fall Business Conference Week of the American Paper and Pulp Association, Chicago, Ill., November 1 to 4, 1921.

Tuesday, November 1.

10.00 a.m.—Book Paper Manufacturers' Association, Blackstone Hotel.

10.00 a.m.—Card Board Manufacturers' Association, Drake Hotel.

10.00 a.m.—Pulp Manufacturers' Association, Drake Hotel.

11.30 a.m.—Salesmen's Association of the Paper Industry, Chicago District, followed by luncheon and afternoon program, Drake Hotel.

2.30 p.m.—Cover Paper Manufacturers' Association, Blackstone Hotel.

7.00 p.m.—High Grade Paper Conference with Merchants, Blackstone Hotel.

Wednesday, November 2.

10.00 a.m.—Gummed Paper Manufacturers' Association, Drake Hotel.

10.00 a.m.—Board Section of the American Paper and Pulp Association, Drake Hotel.

10.00 a.m.—Waxed Paper Manufactures Association, Drake Hotel.

10.00 a.m.—Writing Paper Manufacturers' Association, Blackstone Hotel.

10.30 a.m.—Wrapping Paper Manufacturers Association, followed by luncheon and afternoon program, Drake Hotel.

2.00 p.m.—Woodlands Section, Drake Hotel.

2.30 p.m.—Sulphite Bond Division, Blackstone Hotel.

8.00 p.m.—Vegetable Parchment Manufacturers' Association, Drake Hotel.

Thursday, November 3.

7.30 a.m.—Breakfast of the Glassine & Greaseproof Manufacturers' Association, Drake Hotel.

10.30 a.m.—Third Fall Business Conference of the American Paper and Pulp Association.

Friday, November 4.

10.00 a.m.—Tissue Paper Manufacturers' Association, Blackstone Hotel.

2.00 p.m.—Toilet Paper Converters' Association, Blackstone Hotel.

Technical Section

REVIEW OF RECENT LITERATURE.

A-3. Isolating the Fibers of Seaweed ("Sugano", Phyllospadix Scouleri Hook). Fr. patent No. 510,373 YOHACHIRO HASHIMOTO, Japan, Sept. 4, 1920. **Papier,** 69 (Feb. 1921). The "sugamo" is harvested, dried if necessary, cut into pieces of suitable length, boiled for half to one hour on a 10 percent milk of lime (keeping it completely immersed by suitable means), removed from the lime, washed, and boiled for 20 to 50 minutes in a 1° Be′ sodium bisulphite solution. This treatment softens the peel, which can then be very easily separated from the fibrous portions of the stalk. —A. P.-C.

E-2. Use for Sulphite Waste Liquor. Fr. patent No. 505,264, Strehlenert, April 17, 1917. **L'Industrie Chimique,** viii, 26 (Jan. 1921). According to U. S. patent No. 1,149,420 the SO_2 of the waste liquor is converted into SO_3, and the calcium lignosulfonate is decomposed and precipitated by introducing air into the receptacle to raise the pressure and insure oxidation. In certain cases there is but very little free SO_2 and for the manufacture of alcohol it is necessary to add 0.1 to 0.5 per cent of sulfuric acid. This patent covers a special manner of adding this acid. When the digester is relieved to lower pressure, the relieved gases, which are acid, are led into an autoclave used for the decomposition of the waste liquor at a pressure of one atmosphere. The liquor is then heated, and the pressure rapidly rises above the boiling pressure at the prevailing temperature. At about 200° Cent. the SO_2 is immediately transformed into SO_3, and free sulphur is deposited. Sulphurous acid does not act alone to decompose the calcium lignosulphonate; for formic and acetic acids, and other organic compounds present in the gases also take part in the reaction. Atmospheric oxygen, or other oxidizing agent, may be introduced if it is desired to obtain a stronger acid mixture. —A. P.-C.

E-2. Deacidification of Sulphite Waste Liquors. Fr. patent No. 506,234, B. GRATZ, November 13, 1919. **L'Industrie Chimique** 400 (November 1920). Same as Br. patent No. 150,571, November 26, 1919. See Pulp and Paper, xix, 42 (Jan. 13, 1921).—A. P.-C.

F-2; M-0. Evaporated Feed and Overflow Regulator. Can. patent No. 209,100, THE GRISCOM RUSSELL CO., assignee of JOSEPH PRICE, both of New York City, N.Y., U.S.A., March 1, 1921. The inlet valve of the evaporator is controlled so as to maintain a constant level in the evaporator; and the discharge valve is automatically regulated in such a manner as to maintain the discharge at a uniform concentration, notwithstanding variations in the rate of evaporation. Claims allowed 17.—A. P.-C.

F-2. Eliminating Bad Odors from Soda Pulp Mills. Fr. Patent No. 506,629, ERIK SIXTEN SANDBERG and GUNNAR SUNDBLAD, Sweden, November 26, 1919. **Papeterie,** 109-10 (Feb. 10, 1921). Malodorous substances in soda pulp mills are formed in the following manners: (1) In the digesters during cooking, whence they escape with the vapors from time to time; (2) during evaporation of the liquor, the CO_2 and SO_2 contained in the hot gases of combustion reacting with the liquor to form various malodorous substances, mainly hydrogen sulphide and methyl mercaptan; (3) when treating the condensates obtained from (1) and (2) and when purifying the by-products obtained from the condensates. According to the present invention these substances are all collected in the one place and burned either in the recovery or the smelting furnace as follows: (a) malodorous substances formed as indicated under (1) and (3) are introduced into the smelting furnace mixed with the air that is supplied to the furnace; (b) the production of the malodorous substances formed as indicated under (2) is prevented as far as possible by concentrating the liquor in indirectly heated evaporators (i. e., without direct contact of the hot gases with the liquor) as far as possible, and then introducing the concentrated liquors directly into the furnace to furnish the evaporation and burn the residue. This makes it possible to maintain a higher temperature in the furnace, which in turn makes it possible to burn the malodorous substances. As the gases coming from the digesters, differs, evaporators, etc., contain a large amount of water vapor, which makes them very difficult to burn, they are first passed through a condenser which condenses a large part of the water vapor, and the remaining gases are then washed thoroughly with cold water, and the malodorous substances are condensed.—A. P.-C.

F-5. Extraction of Fibrous Material from Plants. Fr. patent No. 504,036, J. BOUDON, France, March 31, 1920. **Chimie et Industrie** VI, 206 (Feb. 1921). The material is treated with caustic soda in its nascent state (produced by means of carbonate of soda and lime, electrolysis, etc.) The action is quicker than with ordinary caustic soda, the consumption of soda is reduced by 30 percent the strength of the cellulose is not impaired, and the loss of cellulose is reduced 20 percent. The treatment of the plants varies with their nature and moisture content.—A. P.-C.

F-0. Pulp Process. Can. Patent No. 208,927, GONZALO JOSE BUSTAMANTA, South Hadley, Mass., U. S. A., March 1st, 1921. The vegetable matter is dried, immersed in cold water, separated into coarse fibers which are deposited in a receptacle containing quicklime, and treated successively with a cold alkaline solution, a bleaching agent, and a solution of volatile alkali. The bath thus formed is acidulated with hydrochloric and sulphuric acids, and the fibers are washed and comminuted. Claims allowed 4.—A. P.-C.

G-8. Machine for Dehydrating Paper Pulp. Fr. patent No. 511,007, JACOB LENGENHAGER, Austria, Sept. 17, 1921. **Papier,** 69-72 (Feb. 1921); **Monit. Papeterie,** 130 (March 1, 1921).—A. P.-C.

H-4. Hypochlorite Solutions by Electrolysis. Fr. patent No. 505,874, Pestolizza, Nov. 8, 1919. **L'Industrie Chimique,** viii, 59 (Feb. 1921). The conditions under which the electrolysis is conducted (circulation, temperature, concentration) are such that the products which are set free at the anode and at the cathode combine to form hypochlorites. The apparatus in which

the electrolysis is carried out is divided into several cells by means of graphite plates arranged transversely which constitute the electrodes. Each of these electrodes acts on either side as an anode and cathode respectively. The cells communicate by means of openings in the graphite electrodes. The electrolyte is thus forced to follow a zig-zag path through the cells and issues as a hypochlorite solution.—A. P.-C.

H-4. Manufacture of Sodium Hypochlorite Solutions. Fr. patent No. 509,666, Société L'Air Liquide, April 19, 1919. **L'Industrie Chimique**, viii, 59 (Feb. 1921). The chlorine and the caustic soda which come from electrolytic cells are recombined to form hypochlorite. The liquor can very easily be cooled to prevent the formation of chlorates. To obtain a perfectly stable product in which the soda has been perfectly neutralized by the chlorine, a constant proportion of the chlorine formed, say 1/15, must be continually removed.—9. P.-C.

H-4. Improvement in Manufacture of Bleaching Powder. Fr. Patent No. 488,594, CASTNER-KELLNER ALKALI CO., LTD., and J. W. MOORE, January 24, 1918. **L'Industrie Chimique**, 88 (March, 1919). Slaked lime is treated with chlorine gas in a long slightly inclined cylindrical chamber, which is given a rotary motion. The inside of the reaction chamber is provided with bars which serve to raise the powdered lime and allow it to fall through the chlorine-laden atmosphere, so that the contact of the powder with the gas is much more thorough. The counter-current principle of absorption is utilized, and the chlorine is prevented from going through too rapidly by the inclination of the chamber. The chlorine is kept under a slight vacuum to prevent escape through the leaks which are almost sure to be present.—A. P.-C.

K-7. Improved Beater. Fr. patent No. 512,767, GRILEY-UNKLE ENGINEERING CO., U.S.A. **Monit. Papeterie**, 160-2 (March 15, 1921). The hood, back of the cylinder, is perforated to allow of the continuous removal of part of the stuff as soon as it is sufficiently beaten, without waiting for all the stuff to be completely beaten, which would result in some of it being overbeaten. The perforations in the hood are kept clear by means of a spray and also of blades slowly moving back and forth against the hood. A rag catcher is also provided.—A. P.-C.

K-10. Process for Sizing Paper. Fr. patent No. 512,124, RUDOLF LENDER, Germany. **Monit. Papeterie**, 129-30 (March 1, 1921). Artificial resins obtained by the polymerization of coumarone (C_8H_6O) and of indene (C_9H_8) are mixed with various saponifiable resins, such as colophony, rosin, etc., or with various saponifiable vegetable, animal, or mineral oils or fats and are then emulsified with alkalis, ammonia, or potassium silicate solution, the proportion of alkali determining the consistency of the resulting soap.—A. P.-C.

K-11. Screen for Rag Stock. Fr. patent No. 511,518, JOSEPH HENRY CHARVET, (Isere), France. **Papeterie**, 210-3 (March 10, 1921). The unbeaten half-stuff at a consistence of 0.2 percent is sent through suitably arranged blades or rods which stop the longer fibers, but allow the shorter ones to go through along with any dirt or impurities. These shorter fibers are then screened through one of the usual screens, thus eliminating the impurities.—A. P.-C.

K-12. Responsibility for High Newsprint Prices. W. J. PAPE, president of the Publishers' Buying Corporation, **Paper**, xxviii, 3 (March 23, 1921). Analysis of the causes which made the price of newsprint go so high in 1919 and 1920, showing that production was greater than it had ever been before, that manufacturers were doing all in their power to turn out as much paper as they could, and that the excessive prices were due to panic, speculation and hoarding on the part of the newsprint consumers.—A. P.-C.

K-12. Ball Bearings in Paper Machines. Papeterie, xliii (March 10, 1921). Brief outline of the advantages of using ball bearings on paper machines.—A. P.-C.

K-14. Instrument for Testing Tearing Resistance of Paper. Fr. patent No. 509,276, SIDNEY D. WELLS and ROBERT J. MARX, England, Aug. 12, 1920. **Papier**, 66-7 (Feb. 1921); also **Papeterie**, 110 (Feb. 10, 1921). The patent covers a device for measuring the resistance of paper to continuation of a tear that has already been started. The paper is firmly clamped in a suitable device and is pressed down against a dulled blade which has a sharp projecting point to start the tar. The blade is rigidly connected to a spring, and the pressure is transmitted to a suitable indicating or registering device. — A. P.-C.

K-14. Slitting and Rewinding Machine. Fr. patent No. 463,440, PAPETERIE DE NANTERRE, **Papeterie**, 7 (May 25, 1919), **Paper**, xxvii, 26 (March 2, 1921). Translation by A. Papineau-Couture. See **Pulp and Paper** XVII 826, K-14 (Sept. 25, 1919).—A. P.-C.

K-16. Extensible Wrapping Paper. Fr. Patent No. 508,293, ARLELL SAFETY BAG CO., U. S. A., Jan. 10, 1920. **Papeterie**, 160-2 (Feb. 25, 1921). The paper is made from one or more thicknesses of paper, creped in two directions and glued together with some waterproofing adhesive substance, such as asphalt, which remains soft and pliable.—A. P.-C.

K-18. Corrugated Cardboard. Fr. patent No. 509,319, W. G. BISKE, England. **Monit. Papeterie**, lii, 100-1, (Feb. 15, 1921). Same as Br. patent No. 145,854, June 29, 1920.—A. P.-C.

K-21. Tarred Roofing Paper. A.. LAMBRETTE. **Papeterie**, xliii (March 10, 1921). Brief description of the equipment and process used industrially.—A. P.-C.

K-23. Reenforced, Waterproof and Translucent Paper. Fr. patent No. 513,139, MARIE LOUIS PAUL NOUETTE-DELORME, (Seine), France. **Monit. Papeterie**, lii, 129 (March 1, 1921).—The paper is reenforced by means of a more or less closely woven fabric of suitable material (vegetable or otherwise), or by means of a wire gauze, which is incorporated into the pulp during its transformation into paper before it goes through the presses. It is rendered waterproof and transparent by sizing with rosin, linseed oil, manganese resinate, and spirits of turpentine (in the proportions of 100 parts, to 80, to 15, to 25 respectively). This sizing process may also be used with non-reenforced papers.—A. P.-C.

K-23. Manufacture of Insulating Plastic Composition. Fr. patent No. 501,038, MOTTA, RUGIA and VILLAIN, March 31, 1920. **Technique Moderne**, 544 (Dec. 1920); **Papeterie**, 1130 (Feb. 10, 1921). Composition obtained by mixing a given quantity of unsized paper pulp with an equal weight of a mixture of equal volume of calcium carbonate and magnesium silicate; or else by applying the carbonate and silicate to a suitable elastic base such as paper, cardboard, etc., instead of incorporating them into the mass of the pulp.—A. P.-C.

K-23. Manufacture of Mottled Paper. Fr. patent No. 506,632, CHARLES CLARK ORCUTT, U. S. A. **Papeterie**, xliii, 205/9 (March 10, 1921.—A. P.-C.

(Continued from page 1070.)

as besides different means of occupying their men, nearly all mills have reduced also the working time, by introducing the 8 hour shift, which according to a recently adopted bill is to come legally into force on the first of next month in all the Belgian industries.

With the end of the holiday season, pleasure of business seems to have revived. Since a few weeks there is a steady improvement in the paper trade as in all industries generally, and although there have been no changes in prices of paper as they have existed during the past three months, most of the mills have now orders enough ahead to keep their machines running for more than a month.

Since the beginning of the year paper prices went down about 35 per cent. They are at present as follows, per 100 kg. and in francs:

Strawboard, 45-55; Ordinary wrapping, 80; Strong, 120-130; Butchers parchment, 150-165; News print, 90-110; Wood free printing, 205-225.

During the same period prices of pulp went down to a greater extent, they are now about as follows f.o.b. Antwerp, per 100 kg. in francs:

Mechanical, dry, 38-45; Strong sulphite, 60-65; Easy bleaching sulphite, 65-72; Bleached sulphite, 85-90.

The prices of pulp already show a tendency of going up again, owing to the renewed activity in the paper trade and to the reports that Scandinavian stocks are exhausted and pulp mills are still working at reduced output.

Generally speaking, prospects are decidedly optimistic and the prevailing opinion in authorized paper circles is that the market is likely to remain firm at least for the balance of the year.

A dark cloud on this bright horizon is the handicapping of the export trade, by the continually increasing number of countries which are putting, or advancing, protecting tariffs on imported paper. Till now, Belgian paper makers are not taking the matter very tragically, as they feel confident that the fiscal isolation to which former customers have decided, will induce the government to devise some reasonable form of protection, that will make it impossible to Germany to undermine the market in our own country.

FEW NEW PAPER MACHINES ORDERED FOR NEXT YEAR.

New York, Oct. 15.—Significant figures as to the future growth of the paper industry are made public by the American Paper and Pulp Association, which finds that only four new machines are scheduded for installation in the entire industry for 1922, as compared with the 53 machines being installed in 1921.

The record year of 1920, when such mills as the newsprint mills were producing at more than their registered capacity to meet the demands of publishers, was accompanied by the placing of contracts for much additional machinery. The year of 1921, however, with an influx of cheap foreign paper, in the absence of tariff legislation to protect manufacture in the United States, has seen contracts for little new capacity.

Figures just compiled show a total of 53 machines scheduled for this year, and only four for 1922. Of the new machines scheduled this year, eight are for newsprint, ten each for book and board, five for wrapping, six for writing, seven for tissue, two each for roofing felt, glassine and specialties and one for blotting. The 1922 installations are one for book and three for board. The increase for the two years over 1920 is largest in felts and building with 12.5 per cent, board being next with 12.4 per cent and book third with 11 per cent. Newsprint shows an increased schedule of 9.2 percent, tissue of 9, fine papers of 6.2 percent and wrapping of 4.7 percent.

NO PRIVATE PAPERS IN RUSSIA.

A big factor in the world's paper market conditions for many months past has been the abstention of Russia as a paper consumer. In normal times Russia imported large quantities of pulp and paper from Finland, Sweden, Norway and Germany. Her inability or unwillingness since the resolution to buy from these countries has been responsible in a large measure for their turning to the trans-Atlantic market where they compete with Canadian and American producers.

At the present time the Soviet Government of Russia is making extensive purchases of Finnish, Scandinavian and German paper. According to a report made by U.S. Consul Leslie A. Davis, of Helsingfors, Finland, and published in the current issue of the Washington Commerce reports, Russian purchases of Finnish paper and other commodities have amounted to 40,000,000 Finnish marks (normally about $7,600,000 in U. S. dollars). Russia, according to the report, is practically out of paper. Russian paper mills have ceased to operate. The Government has seized all stocks of paper, leaving but a limited quantity in the free market.

Private individuals get no paper at all. Theatres, opera houses and other places of amusement use old forms for tickets. Newspapers vary their circulation according to the paper supplies allotted to them, sometimes issuing small and sometimes larger editions.

Books for propaganda purposes are given the preference, and when their requirements are satisfied no paper remains for educational works. In Petrograd five daily newspapers maintain an existence in spite of the paper famine. In Moscow there are also five. All are government owned, there being no private newspapers in existence.

Next to Finland, Germany seems to be forcing the Russian paper market. "Large lots of German rotation and mouth-piece paper and different sorts of sheet paper were stored in the customs houses at Moscow," reports the delegate of the Finnish Paper Mill Association who recently returned from Russia and who is quoted by the American Consul. "Writing paper with German watermarks could be seen everywhere in the government offices. The German business men made satisfactory deliveries and the prices were very favorable. The Soviet representative has been staying in Berlin, where he made large purchases."

Ordinarily, Russia is capable of absorbing practically the entire export output of Finnish and German paper and the fact that Russian importations of paper from those countries are now resumed, with the probability of being progressively increased, indicates that there will be less Finnish and German paper for American buyers as time goes on.

Mr. William H. Parsons, President of Parsons & Whittemore, Inc., sailed from New York on the Munson Line's new steamer "Southern Cross" on October 1st, for Rio de Janeiro, Brazil. Mr. Parsons expects to visit the River Platte countries as well as Brazil.

British Trade News

(From Our London Correspondent).

London, Oct. 8, 1921.—When the Prince of Wales visited Messrs. Wiggins, Teape & Co., Ltd., Devon Valley Paper Mill, at Hele, a film was made as he passed through the various departments. The film is now being exhibited to printers and others associated with the paper industry and it forms a most excellent advertisement for Messrs. Wiggins, Teape & Co., Ltd., who, at the chose of the show, usually extend a hearty invitation to those present to call in and inspect any of the firms' mills when in the vicinity of them.

How Government Methods Hinder Firms.

The necessity of business-like Government is amply demonstrated in the reports of some of the British paper mills and firms. As a matter of fact the present rule-of-thumb methods of the Imperial Goverment have been put in the scales and are found "wanting," so much so, "that the Wall-Paper manufacturers state that although it has been usual to pay their final dividend on the preference shares on November 1st. in view, this year, of the depreciation of stock values during the past year and the difficulty in assessing their reclaim from the State under the Excess Profits Duty, they have deferred consideration of this dividend until the completed accounts are presented. It will be recollected that under the Excess Profits Duty manufacturers had to hand over surplus profits made. In other words when they were making a decent profit and putting a bit by for a rainy day the Government grabbed all surplus money—and more than their share. Now reclaims are order of the day. The St. Neots Paper Mill Co. Ltd. have also issued the following announcement: "Owing to the fact that in the case of this company the year ending April 30th, 1921 is the last of the seven years fixed by the Government for adjusting Excess Profits Duty, and two or three important questions in connection therewith remain unsettled, the directors deem it desirable to postpone the issue of their annual report and accounts until these questions have been disposed of, but have decided to pay a second interim dividend of 2½ p.c. (free of tax) and enclose warrant therefor on amount of your holding." What would Canadians say if their accounts and annual report was held up by, say, the shortsightedness of the Canadian Government? They certainly would not take it lying-down like their British confreres. Since the close of the war England has been a land of waste and blunderers, and today mill owners do not really know where they stand with the Government and Labor elements.

Financial Reports.

Some of the mills are now announcing facts relating to their progress. John Dickinson & Co. are declaring an interim dividend of 2½ p.c., less tax, on their ordinary shares. The Burnley Paper Works announce a dividend of 9d. per the £1 shares. For 1919-20 a dividend of 35 p.c., free of tax was declared and in October 1920 a bonus of 100 p.c. in shares was distributed. The well-known firm of Messrs C. Davidson & Sons, Ltd., state that their disposal balance of profit for the year ending July 31st last, after making allowances for repayment of Excess Profits Duty, is £4,823 of which £2,209. 8s. was distributed per interim dividend in April last and the directors recommend that the remainder be disposed of as follows:— (a) By writing off depreciation the sum of £1,000; (b) by leaving the remainder £1,613 18s. at the credit of profit and loss account. This year has been an abnormal year in every respect. At the commencement, in accordance with an agreement made between the Employers' Federation of Papermakers and the Workers' Unions, a large increase of wages had to be given. Towards the end of 1920 a steady falling off in business took place generally, which culminated later in a complete slump in the paper trade of the country. From these causes and from the coal strike the company has suffered considerably, but the directors consider that the results shown are satisfactory in face of the difficulties encountered. While regretting that they cannot recommend the payment of a further dividend, the directors believe that a better tone is evident in the trade, and having fully provided for the losses of the past year, they are hopeful that with care and strict economy improved results should be obtained.

The Exhibition at Toronto.

A certain amount of interest is being manifested in the Canadian National Exhibition, at Toronto. Messrs. John Oakey & Sons, of London, are exhibiting emery paper, glass and flint paper. Other are likely to follow.

Technical Section.

The British Technical Section of the Papermakers' Association has held a very successful conference in Edinburgh in the Heriot Watt College. Mr. Charles Baker (the chairman) presided and there was a good attendance. Several papers were read, one of which appears in this number in the "Pulp & Paper Magazine." But one of the great attractions of the conference was the limelight exhibition showing how the Canadians made newsprint. It opened the eyes of the British Technical men and they are now appealing for the film to be shown in Manchester and other centres. During the conference, Messrs. Bertram's engineering works were visited and the up-to-date methods adopted by British engineers in papermaking machinery were studied with interest. The conference was a great success, instructive, and Edinburgh was just the right centre for true Scottish hospitality.

Imports of Boards.

During the last couple of months there is a notable falling-off in the imports of boards from Canada. No doubt the demand is not great on this side, but still the market must not be lost sight of. The following show the returns for August—the latest return:

Millboards: Germany, 3,756 cwts.; Sweden, 6,510 cwts.; Norway, 3,415 cwts.; Finland, 3,348 cwts.; Canada, 6,240 cwts.; U. S. A., 486 cwts.

Strawboards: Belgium, 880 cwts.; Netherlands, 143,-263 cwts.; Germany, 201 cwts.; Sweden, 78 cwts.; France, 35 cwts.

Leatherboards: Finland, 380 cwts.; Sweden, 681 cwts.; Czecho-Slovakia, 240 cwts.

Cardboards and Pasteboard: France, 16 cwts.; Germany, 868 cwts.; Netherlands, 107 cwts.; Sweden, 11,-083 cwts.; Norway, 461 cwts.; Denmark, 474 cwts.; U. S. A., 563 cwts.; France, 4 cwts.; Italy, 6 cwts.; Switzerland, 24 cwts.

The Pulp Market.

The market for groundwood pulp is lifeless and the same may be said with regard to the chemical pulps market. It is realised that until the paper industry can get out of its present dormant condition there will be no great movement in pulps.

Prices are about as follows: Bleached sulphite, £20; Easy Bleaching (No. 1) £17. 10s.; Sulphite newsprint

(strong) £16. 5; Unbleached Soda No. 1) £16. 5s.; Soda kraft, £14. 10s.; Groundwood (prompt delivery) £4. 10s; Groundwood (dry) £8 per ton prompt delivery.

Chemical Research.

A significant remark appears in the paper "Fundamental Chemistry in Papermaking," by Mr. J. Macdonald, D. Sc., read at the Technical Section Conference. It is: "Germany, the United States, and Canada, are actively prosecuting chemical inquiry into papermaking problems. If the British industry is to maintain its place in the world's markets, it would appear unwise to neglect this avenue to progress."

We have always been told that the British paper industry can hold its own in the markets of the world. No doubt it can, but it wants to take a few examples from the countries named by Mr. Macdonald in chemistry. If the Technical Section is doing nothing else it is certainly opening up new "avenues" and placing the British paper industry on a higher, and more intellectual level. We are living in a new area; the principles of the Victorian days are over—we are now in an age of Science.

IMPORTANT DISCUSSION FOR FORESTERS.

Editor, Pulp & Paper Magazine.

The need for technically trained men to handle the many technical problems involved in the efficient utilization of forest products is becoming more and more generally recognized. The scope and character of the training which should be received by men planning to specialize in this field are discussed in the report presented at the Second National Conference on Education in Forestry and should be of interest not only to educators but to all wood users.

Since the entire subject is to receive further consideration at the annual meeting of the Society of American Foresters in Toronto next December, comments by your readers with particular reference to following points will be welcome:

1. What openings are there now and what openings will there be in the comparatively near future, in specific industries, for men particularly trained to specialize in the field of forest products?
2. Exactly what will be the character of their work?
3. Just what training will best fit them for it?
4. What salaries can they expect both at entrance and after several years' experience:
5. How can adequate opportunities for the training of such men best be provided?

Comments on these and related points may be sent to any of the undersigned, who constitute a sub-committee of the Educational Committee of the Society of American Foresters on the training of specialists in forest products.

Very truly yours,
Chairman, S.T. Dana,
Forest Commissioner, Augusta, Maine.
Hugo Winkenwerder, Dean,
College of Forestry, University of Washington,
Seattle, Wash.
O. M. Butler, Assistant Director,
Forest Products Laboratory,
Madison, Wis.

Where there is a brighter, warmer spot than in the sunshine we create for others? It is the secret of happiness.

PAPER TRADE BETTERMENT CONTINUES.

Evidences of betterment in the pulp and paper industry continue to multiply. American newspapers, the largest consumers of newsprint in the world, are daily increasing their use of paper from the low level of the past few months. A decided expansion in daily newspaper advertising, much of which is of course merely seasonal, is apparent and is likely to continue at any rate until the close of the year. The 40-page daily and the 120-page Sunday paper, which disappeared altogether early in the Summer, are again in use. Newspaper circulation, dormant for months, has started to grow.

One New York daily reports an increase of 100,000 over last year. The Chicago Daily Tribune and its auxiliary publications are reported to be using 30 tons more newsprint daily than is being produced in their Canadian mills, which normally exceeds their requirements. The "United States Service," a business men's weekly barometer, sent out from Washington, after months of "bearish" advice on the paper situation, is now advising its clients to purchase and hoard paper against lessened supply and higher prices which it foresees in the near future. The prices of pulp of all grades and of other paper making materials are stiffening. Mills idle for some time are coming back into operation.

While these developments still leave the industry some distance from the peak of activity it enjoyed a year ago they are looked upon as indicating a much more stable condition of trade in the near future and will, no doubt, if they continue, have a bearing when it comes to deciding upon next year's prices which may not be much before the end of November.

In regard to European paper and its effect on the American market, neither American nor Canadian producers look upon it as a really serious factor. They recall that normally this continent is not a natural market for European paper and that even as recently as a year ago, such imports were negligible. They assert that in the paper business conditions are subject to reversal almost over-night and say that it would not be surprising to see European paper disappear from the American market with the same suddenness with which it made its appearance a few months ago. A revival of paper consumption in Europe, which many believe to be imminent, would, they say, go a long way towards bringing it about.

GIBBS-BROWER COMPANY OPEN ENGINEERING DEPARTMENT.

Gibbs-Brower Company, 261 Broadway, New York City, who are well known in the Canadian pulp and paper field as general agents for American and European paper and pulp mill machinery and as pulp and paper mill brokers, announce that they have organized an engineering department to enable them to take care of the needs of different mills for special machinery. They are prepared to investigate any problem of manufacturing or machinery which the mills may have and give them a report on this without any obligation whatever. They will then invent, design and build suitable equipment to take care of requirements. For this work they have associated with them a consulting engineer of high standing and broad experience in paper working machinery and paper products.

"The best time to hold on is when you reach the point where the average fellow would quit."

PULP AND PAPER NEWS

The thirty-fifth annual convention of the United Typothetae of America opened at the King Edward hotel, Toronto, on Monday last. Monday's program comprised a complimentary dinner to the U.T.A. secretaries, a conference of secretaries, and a demonstration of the local Typothetae Bureau services. The business convention opened on Tuesday, and included in its proceedings were meetings of the Educational Round Table and the various branches and divisions operating under specialized departments. Mr. William J. Eyon of Washington, D.C., assisted by the five vice-presidents, is presiding over the convention, which is still in session as this goes to press. The Toronto representation is headed by Mr. Douglas Murray.

An especially gratifying feature of this year's convention of the Typothetae is that it is on an exceptionally large scale. In other respects, too, it bids fair, by the time it has closed, to be pronounced the most successful in the history of the organization. Several hundred of delegates are in attendance, representing the 5,000 members of the organization. The Typothetae of New York City have sent 100 delegates to the convention, and other centres are represented by a delegation of generous size.

The United Typothetae of America was formed for the purpose of raising standards in the printing industry. It has dealt with many problems affecting it, and branches of the organization have been established on all the large centres of the continent. It is announced that it will continue its work along these lines and will endeavor to lay such plans as will create a demand for more and better printing. In addition to its membership of approximately 5,000 in Canada and the United States, it posseses members in Mexico, Australia and South Africa.

What gives unusual interest to this year's convention of the Typothetae in Toronto is that it is being held in that city while the strike in the printing trade, which has already lasted nearly five months, still continues and with no obvious signs of its early termination. The policy on the side of the employing printers is being shaped by the Defence Committee of the Toronto Typothetae of which Dr. S. W. Fallis, steward of the Methodist Bookroom, is chairman. The men's organization, Local No. 91, International Typographical Union, is taking advantage of the assembling of the Typothetae in convention to issue some very effectively-written and strikingly-printed advertisements in the Toronto papers,giving reasons for the men's demand for a forty-four hour working week, which according to one advertisement, will result in (among other good things) "further improved printing at no added cost". Of course it is on this very point that the Toronto Typothetae join issue with the strikers.

Mention was recently made in these columns of the action entered by the Ontario Provincial Government against the Russell Timber Company, of Port Arthur, Ont., in respect of reimbursement for timber alleged to have been wrongfully taken by the latter. The case has now been settled out of court, the terms of settlement including the payment into court by the Company of a sum of $37,500 together with interest to date from the date of the Timber Commission's findings, and the sale by auction of 2,000 cords of pulpwood, from the proceeds of which sale, $17,500 is to be paid to the Government and the balance to be retained by the Company.

The Howard Smith Paper Mills, Ltd., which recently declared the regular quarterly dividends of two per cent. on both common and preferred stock, has opened its own pulp mill at Cornwall, Ont., which step, it announces, will enable it "to control the development of our product from standing timber to the finished sheet of paper." The Company adds: "The mill itself is of the most modern construction, and contains the last word in equipment necessary for the production of a standardized quality of high-grade pulp. In addition to the mill, our own electrolytic bleach plant will soon be producing our own bleach. A further addition is made in a filtration plant, which will ensure for the production of Beaver S papers, a purity of water supply unsurpassed in quality. The very source of our water, the St. Lawrence river, is one of the purest courses of water in the world for this grade of stock."

A large area of pulp timber is being offered for sale by tender by the British Columbia Government. It is situated near Prince George, B.C., and a proviso attached to the sale is that at least $350,000 must be expended within three years of purchase.

It is believed that the United States Commission to visit Canada respective what is termed the pulpwood "embargo" will shortly be appointed by President Harding. Sir George Foster, the out-going Minister of Trade and Commerce, gave assurances, before quitting office, that everything should be done to facilitate the work of the Commission. But it seems that the conferences which the Commission will hold in this country will be with representatives of the Dominion Government. It is certain that the Provincial Governments, in Ontario and Quebc, are the bodies most intimately concerned with the question. For it is regulations of the Governments of those Provinces which prohibit the export of pulpwood in unmanufactured form from Crown lands situate therein. In any case there is a strong sentiment that these Provincial regulations should not be abrogated, or even modified, in the circumstances in which Canada finds herself today in the matter of the depletion of her forest resources.

The fourth annual meeting of the Canadian Paper Trade Association was held in Montreal on Wednesday and Thursday of last week. The meeting was important and interesting and the attendance was gratifyingly representative.

Mr. John Wolstenholme is visiting Canada in the interest of Charles Walmsley & Co., of which he is managing director.

Mr. A. L. Dawe, secretary of the Canadian Pulp and Paper Association made a business trip to Chicago this week, when he delivered an address.

UNITED STATES NOTES

According to a bulletin from the Washington, D.C. headquarters of the National Geographical Society, Siam, as indicated by the recent shipment of paper making machinery from the United States, is preparing to enter the paper manufacturing field. The plant shipped to Bangkok is intended for experimentation with such raw materials as rice straw and native grasses and, in the view of the Geographic Society, this progressive step is more characteristic of Siam's civilization than the white elephants or little boys smoking big cigars popularly associated with the Asiatic kingdom.

Railway proposals to increase transcontinental freight rates on lumber and forest products moving from Oregon, Washington, Utah and Idaho to El Paso, Texas, by 25 per cent, were held not justified in a finding of the Interstate Commerce Commission. The commission declined also to consider a request for an increase in lumber freight rates from intermediate points, amounting to 33 1/3 per cent. The rates never have been in effect, having been proposed by railroads June 1, and suspended by the commission.

The Los Angeles Times in a recent issue carries a report from Perth, Australia, telling of the making of a good grade of paper from the common eucalyptus tree, the result of successful experiments in West Australia. Various state governments and private interests, the report says, have contributed upwards of $100,000 for the erection of plants, for the installation of machinery, and for further investigation into the matter.

Many of Chicago's printing firms have indicated their belief that there will be an increased demand for printing with the approach of the Christmas season. Quite a little advertising matter is expected by the printing trades in Chicago and as but few of them have any amount of paper stock on hand, this demand should be reflected in increased paper orders.

U. M. Waite, president of the Argo Paper Mills Company at Gloucester, N. J., is personally supervising structural changes in the old Gloucester plant. The mill is being remodelled for the production of newsprint for the "North American" and "Record," Philadelphia dailies, and present plans call for the installation of machinery by mid-November so that operations may be begun at the earliest date possible.

The Calco Chemical Company has secured the serices of Charles E. Foster to take charge of its New England sales department. Mr. Foster, who has had wide experience in both mill and sales work, has assumed his duties at the Boston office of the company where a stock of the entire line of Calco colors is carried for the convenience of the New England trade.

Recent changes in personnel announced by the American Writing Paper Company, Holyoke, Mass., have brought to that concern's forces R. P. Wood, formerly of the R. P. Wood Advertising Agency, Chattanooga, Tenn. Mr. Wood will be located in the Philadelphia territory where he will co-operate with the Garrett-Buchanan Company, the Philadelphia Eagle-A service department of general service of the American Writing Paper Company, has been transferred from Philadelphia to Albany.

Germans in South American countries are said to be selling sulphite bond paper for about 6 cents a pound. Most of the high grade companies in America can sell the same material there at no less than 11.5 to 12.5 cents a pound. This news is contained in a letter received by a large New York concern from a correspondent in Rio De Janeiro.

The Babbitt-Kelley Company, Inc., recently organized in Vermont to engage in the manufacture of paper, has acquired th emanila mill and manila manufacturing department of the Robertson Paper Company, a firm that has operated in Bellows Falls, Vt. for the past twenty years. Frederick H. Babbitt, its head, has gradually improved the Robertson Company's equipment during the term of his control. He is president of the new Babbitt-Kelley Company, and associated with him is Herbert T. Kelley who is secretary-treasurer.

J. W. Quimby has been appointed Eastern sales manager for the Bardeen Paper Company, of Otsego, Mich. An office has been opened by Mr. Quimby at 200 Fifth Aenue, New York, from which he will handle coated and uncoated book and lithograph paper, lithograph blanks, post-card and translucent, together with clay-coated boxboard.

The Valatie, N. Y. property known as the Centennial Mills has been taken over by Mr. Robert P. Richmond, who will again take up the manufacture of light straw wrapping paper for the export and domestic use, producing the same quality paper he has made for over fifty years.

The recently failed American Paperboard Company, Inc., successor to the National Folding Box and Paper Company, of Albany and Ballston Spa., N.Y., carried liabilities of $193,759.69 as against assets of $159,779, according to the schedule in bankruptcy filed with the Federal court in Utica, N.Y. The business of the National Folding Box and Paper Company was taken over by the American Paperboard Company, June 16, 1920, with a capital of $250,000.

Among Canadian mills which have recently increased their capacity, mention should be made of the Kinleith Paper Mills, whose plant at St. Catharine's Ont., has been increased in capacity to twenty-five tons a day of book and writing papers. The concern has added twelve new dryers and another set of press rolls to its No. 2 machine.

A pulpwood loader, owned by Mr. C. J. Bliss, engaged in loading a steamer with pulpwood in Nipigon Harbor, was destroyed by fire, Oct. 6.

Members recently elected by the Technical Section of the Canadian Pulp & Paper Association are: William J. Bolger, Brompton Pulp & Paper Co.; George Robertson, Beaver Board Co., and Herbert Kennedy, Ru-ber-oid Felt Co.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 15th Oct.—Progressive betterment has continued to describe the condition of the paper industry, in nearly all its lines and branches, during the past week. There were some who were inclined to view the improvement which is now in progress, when its first signs were manifested some weeks ago, as a mere "flurry"—a "flash in the pan", as it were. But from the outset, that was not the view taken of it in these columns. Its very slowness, in its early stages, coupled with the fact that it was remarkably wide in its scope, seemed to point to the fact that it was destined to be sure. Moreover, this view received confirmation from the circumstance that the betterment of conditions in the paper industry was coincident with an improvement in general commercial conditions. For stress has, in these columns, persistently and consistently been laid on the fact that, until business generally picked up, no reliable betterment could be looked for in the paper industry, and if and when it did exhibit signs of improvement, as part and parcel of a general trade revival then such improvement would be marked by stability, if also by a certain slowness. At the same time, while it was essential, in order to acquire the needed stability, that the paper trade revival should accompany and form part of a general trade revival, it was obvious that there were reasons such as the depletion of stocks, in the hands of consumers and jobbers, in so many lines of paper, which would cause the betterment in the paper industry, once it set in, to assume larger proportionate dimensions than the betterment in many other lines of commerce and manufacture. Such reasons are, plainly, operating now. Nearly all industries are showing signs of climbing upwards again to the normal standards of a sane and stable commercial life — and the paper industry is climbing faster than many.

Buying generally is by no means of the "hand to mouth" description which characterized it a couple of months ago. But, even now, in too many lines, orders are not as satisfactory as they should be in point of magnitude. One realizes that, just here, the human equation enters into the matter. The reason why orders are not larger is because absolute confidence in the market has not yet been fully regained. In connection with this question of confidence it may not be amiss to emphasize what was said last week with regard to under-cutting of prices by jobbers. The condition of stabilization, which is so eminently desirable, is essential to the full restoration of confidence, and loyalty, on the part of wholesalers, to re-sale prices, would do a whole lot in the direction of bringing about stabilization.

PULP.—The pulp market has displayed a little more liveliness lately. An increasing firmness in prices also gives ground for a little more satisfaction. There has certainly been some stiffening in the demand for chemical pulp. Some consumers are showing a tendency to lay in stocks for future use. Quite a demand has been exhibited for kraft pulp at $65 a ton.

NEWSPRINT.—The demand for newsprint is expanding. The reason for this is to be found in the improvement in general trade conditions which is making a larger demand on newspaper space for advertising, and the approaching electoral campaign will do something considerable to increase the consumption of newsprint. Were it not for the uncertainty as to future price, as to which something was said last week, and which will probably cease to manifest itself ere long, there would be less hesitation in placing orders of magnitude As it is, consumption of newsprint is unmistakably on the increase—and will be sharply so before many moons. On the whole, the newsprint industry of Canada has great cause to pride itself on the manner in which it has passed through a critical period of acute depression. As Mr. George H. Mead, president of the Spanish River Pulp and Paper Mills, Ltd., justly said at the annual meeting of the directors of that Company, the other day, Canada is fortunate in having for one of its basic and greatest industries the newsprint paper business. It has operated throughout the period of depression, at a production of something like eighty per cent. capacity—a larger percentage of production than any other industry comparable with it in size.

BOOK PAPERS.—The improvement in the demand in book papers is now a clearly defined one. Particularly is this improvement noticeable as regards the superior grades. Orders are coming in in greater numbers than for some time, and many of these are considerably larger in individual size than had formerly been the case for a long while. Many orders are for immediate delivery which seems to argue that stocks have become unusually depleted. If this be the case (and there are many reasons for judging that it is) then the outlook in the near future must be regarded as highly encouraging. It is said that present prices will hold.

COATED PAPER.—Manufacturers are increasing their output of coated paper in response to an increasing demand. The outlook is considered to have distinctly improed.

WRAPPING PAPERS.—The demand for wrapping papers continues to expand. In its kraft aspect, the situation is excellent. More than once, recently, the writer has heard the representative of one large mill emphasize the necessity of ordering now and avoiding the Christmas rush. The outlook for domestic trade is good, and the prospects for export trade are decidedly tinctly improved.

TISSUES AND TOILETS.—Tissues and toilets are still in fairly satisfactory demand. That for tissues, which is on the increase, is significant as showing evidence of a betterment in general trade conditions. For it means that trade in textiles and so forth is looking up. Of the same satisfactory nature is the volume of trade that persists in paper boxes.

BOARD.—The board situation is reported as being a good deal better now than it has been for a long time. Orders are coming in much better and this has had the effect of increasing the demand on paper stock and sending up the price of the latter. A higher price for

board is pretty sure to obtain shortly. The better demand for all grades of waste paper which has been exhibited, and of which mention was made last week, continues to be exhibited. Altogether, it looks as though there should be some good business doing in the ensuing months, as regards board and paper waste.

NEW YORK MARKETS.

New York, October 15.—(Special Correspondence).

Activity in the paper industry is steadily on the climb, and business has undergone further expansion this week. Practically every report received, whether from manufacturer, jobber or dealer in papermaking raw material, is of an encouraging character, and the market seems to be getting into a livelier condition each day. Mills which have been running at greatly reduced schedule for many months are gradually increasing their operations until a fair percentage are now working full, and a bullish feature of the situation is that manufacturers are finding a ready outlet for virtually all the paper they are producing. Information gleaned from the jobbing trade is generally that consumers are placing orders for the various grades of paper in by far larger number than in a long time and that the volume of orders is constantly increasing. Printers, publishers, paper box manufacturers, and numerous other large consumers of paper and paper board are once again replenishing stocks, being attracted into the market both by the turn in the trend of paper prices from downward to upward and also by the necessity of larger supplies.

Improvement in the book paper trade during the past few days has been one of the outstanding market features. Book paper mills are said to be obtaining a large volume of business than in a lengthy period, and the gradual upswing in quotations is bringing buyers more actively into view, as would be expected under the ruling circumstances. There is little question that the downtrend in book paper prices up to a short while ago kept many publishers and printers from buying, and now that mill quotations are firmly on the rise, consumers are flocking into the market to lay in stocks and to otherwise cover requirements. A well known mill agent in New York who represents several of the largest producers of book paper in the States yesterday asserted that the last two weeks have been the busiest he has experienced this year, and that the amount of business he had done in this time easily exceeded that of a two-months' period during the summer. This is cited as illustrating how matters in the book paper trade have improved.

Prices on book papers are higher. A majority of mills are quoting 6.25 cents per pound on machine finished book f.o.b. mill, which brings the average cost delivered New York up to around 6.75 cents. Coated and enameled book is quoted at 8.50 cents at the mill, with some manufacturers asking more on better grades, while super book paper is quoted at 6.75 cents at the mill.

Wrapping papers are enjoying a brisk demand. The volume of business is below normal, but at the same time there is a snap to the demand that makes for a lively market condition, and in the aggregate consumers are absorbing large amounts of paper, especially kraft wrapping. Prices are firm with an upward tendency. No. 1 domestic kraft is freely bringing 6.25 cents a pound f.o.b. New York, and some mills are securing better than this price, particularly those situated a good way off from this consuming centre and who have to shoulder a heavier freight rate.

Fine papers are steadily picking up in demand. Jobbers are buying in a consistent manner, and the upward trend of mill quotations is attracting a good deal of speculative buying, speculative in the sense of consumers and jobbers anticipating forward needs and placing orders accordingly. Tissue papers are in good demand and firm in price, with No. 1 white tissue quoted by mills at an average of 90 cents per ream f.o.b. New York. Coarse tissues are in relatively larger demand than fine tissue, and mills making these grades of paper are busily engaged filling commitments.

The newsprint situation is firm but without fresh feature. Demand from publishers is consistent and is slowly but surely growing, and is likely to continue so until the end of the year, as between now and New Years is ordinarily the period of heaviest consumption of print paper. Spot newsprint in standard rolls is selling at 4.25 to 4.50 cents per pound at mills, with foreign paper offered at lower levels.

Box boards of all varieties are moving well and at firming prices. Plain chip is fetching between $37.50 and $40 per ton f.o.b. New York and filled new board between $40 and $42.50, with box manufacturers buying in a fairly regular way. Leading producers have announced an advance of 10 per cent in prices on clay coated folding box boards this week, and patent coated boards are up about $5 a ton from former prices levels.

GROUND WOOD.—There is a steady demand for ground wood and prices hold firm. Various consumers are in the market for supplies—newsprint manufacturers are absorbing comparatively large tonnages, tissue paper mills are buying in good volume, and wrapping and board producers also are taking their usual proportion of mechanical pulp. Considerable talk is heard in the trade anent the decreasing stocks at grinding mills, it being stated that the average grinder is shipping out more pulp today that he is making, and this has a strengthening influence on the market. However, the real sustaining factor is that consumers are buying, and indications are that should demand further broaden, pulp values would undergo additional enhancement.

Around $30 per ton at grinding plants is the price commonly named by domestic producers, with some reported asking higher figures. Now and then an offering of imported ground wood at $28 a ton or thereabouts ex the dock at American Atlantic ports is noted, but there does not appear to be very much foreign ground wood available. Moreover, it is stated that producers on the other side have marked up their quotations to a point where importers cannot afford to book orders at under $30 on the dock here.

CHEMICAL PULP.—The chemical wood pulp market has developed little or no new feature this week. There is a moderate amount of business current; paper manufacturers are generally reported as absorbing fair lots of different grades of pulp, but conservative members of the trade frankly say that the movement into consuming channels is still considerably below normal volume. Prices are holding steady, with an inclination toward higher levels, though, on the other hand, reports are received off and on of a lot of this or that grade of pulp being placed on the market at concessions in price. Kraft continues to be the firmest item, with sellers of both domestic and foreign kraft wanting at least 2.75 cents per pound for No. 1 quality kraft.



•TRADE•MARK•
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SOLE AGENTS in the United States, Canada, Mexico and Cuba for

Finnish Cellulose Association, Helsingfors, Finland

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CHICAGO OFFICE:
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Telephone: Main 1770-71.

INQUIRIES SOLICITED :

Bleached sulphite is quoted at around 4 cents a pound f.o.b. domestic pulp mills or ex dock, although one New York importing concern is said to be offering strictly No. 1 foreign bleached at 3.85 cents. Unbleached sulphite of foreign origin and No. 1 quality is quoted at 2.50 cents, domestic soda pulp at 4.25 cents and news grade sulphite at from 2.50 cents upwards, depending on the quality of the pulp involved.

RAGS.—Papermaking rags continue to advance in price. Signs are not wanting that the rise of prices is due in a large measure to trading among dealers, nearly everyone of whom is very bullishly inclined and who looks for higher market levels, yet it must be said that mills have increased their buying, particularly of certain grades. Roofing rags are moving freely toward mills at 1 to 1.10 cents per pound f.o.b. shipping points for No. 1 packing in the East and at as high as 1.35 cents at dealers' point in the Middle West. Old whites are stiffening in price, with repacked No. 1 whites held at around 5.50 cents at shipping points, and No. 2 repacked at 3.25 to 3.50 cents. New white shirt cuttings also are a strong item, and dealers in New York are reported demanding 11 cents a pound and higher for No. 1 packing. In fact, all grades, of new cuttings are firmly held at prices which paper mills in frequent cases decline to pay. The bulk of demand from mills is for bleachable rags, and it is understood that much difficulty is being experienced with some rags which are being shipped in by dealers containing German dyes which hold so fast that the rags do not bleach properly for consumers' purposes.

PAPER STOCK.—The mild boom in old paper continues and prices are still strongly on the uptrend. Dealers and packers are quoting all manner of prices to mills and in many cases seem to have forgotten all about the proportion of values, naming such figures that paper and board mills are declared to be turning to wood pulp. As an example, it is doubtful whether mills can buy a sizeable tonnage of No. 1 soft white shavings in New York at less than 3.75 cents a pound f.o.b. this city. Similarly, hard white shavings are held at a very high levels, most dealers asking 4.25 cents, or but a trifle less, for No. 1 packing in round lots. Old books and magazines are quoted at 1.60 cents, folded newspapers at 70 to 75 cents a hundred pounds, No. 1 mixed paper at 50 to 55 cents, white blank news cuttings at 2 cents, old No. 1 kraft paper at 2.25 cents, and dump mixed paper at 40 cents. Dealers contend that they are not beginning to get usual amounts of old paper from print shops and other sources of supply, and assert that the active demand from mills warrants their getting the high prices asked.

OLD ROPE AND BAGGING.—The old rope market is firm and No. 1 manila rope is readily selling to paper mills at around 4.50 cents per pound at shipping points, with some dealers reporting receiving slightly higher prices. Old bagging is in somewhat better demand and No. 1 scrap bagging is generally held by sellers at around a cent per pound, with No. 1 scrap gunny quoted at 1.10 to 1.15 cents and roofing bagging at 60 to 65 cents a hundred.

PAPER AND PRINT AT LEIPZIG FAIR.

Business in the paper section of the Leipzig Fair is described as only moderate. The two principal buildings devoted to the paper industry were fully occupied. At numerous places worked-up paper of the most varied shapes could be seen. In the cardboard and packing material sections a large choice of cardboard articles, ranging from the plain hard paper roll to sweet boxes lined with velvet and silk, were exhibited. There is a general tendency to manufacture folding boxes for articles allowing of easy transport. Several types were displayed, among others the "Dowa Box" and the "Patent K Box."

In the letter paper cassettes a brisk business was done, preference being given to articles of first class quality paper. Among accountants' books, the so called American daybooks were in particular demand, but but lower priced books also met with a ready sale.

Among decorations for tables, walls, lamps, etc., there were lamp-shades of crepe-paper, flower pot covers of plaited crepe bands, sweet bags, travelling bags and all kinds of imitation stuffs, such as tablecovers, napkins, etc., in coloured crepe-paper; it is true that the large transactions expected were not effected, but the business done was satisfactory.

In block calendars business was good, and a particularly lively trade was done in artistic advertising calendars. Business in view-cards, writing materials, and school requisites was slow. For foreign countries stylish notepaper, blotting-pads, picture post-cards, and artistic prints met with a good sale.—World's Paper Trade Review.

Mr. John Matthews, prominently identified with the export gaper business for a number of years has associated himself with Parsons & Whittemore, Inc., commencing October 17th. Mr. Matthews' experience in the export paper trade is well known and his association with Parsons & Whittemore should further strengthen their world wide sales organization.

Scandinavian American Trading Co.

50 E. 42nd STREET TELEPHONES 8311 8312 1813 MURRAY HILL **NEW YORK**

Write us when you have any surplus of **Ground Wood** Bleached or Unbleached. We are always in the market.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., October, 27, 1921. No. 43

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

Subscription to any address in Canada, United States and British Empire, $5.00 yearly. Other Countries Postage Extra. Single copies, 15 cents.

Changes of advertisements should be in the Publishers' hands ten days before the date of issue.

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EDITORIAL

DRAWING BLOOD.

There is the old adage that one cannot get blood *from* a stone, but we know from experience that one can draw blood *with* a stone if the aim is good enough. These few lines are frankly intended to be a stone thrown with the deliberate intention of drawing blood. The blood we want in this case is life blood for the Technical Section and by this we mean interesting papers and lively discussion for the annual meeting that will take place in January.

There are a number of members who are known to have solved, or to be working on, problems that are of importance and interest to the whole industry and it would be comparatively easy for these gentlemen to put their results in the form of papers to be read at the meeting. The vigor and the success of the Canadian Technical Section are directly dependent upon the interest taken in the regular meetings and the work done between times by faithful committees. It might be said that the committee work is the bone and the papers and discussions the blood of the Section. Both are required. The success of our Canadian Technical Section is somewhat envied by our confreres in other countries and the fellowship and cordiality of our meetings are widely known. In spite of the high standard that is being maintained, it is possible to improve even upon the good record already set. To do so, in fact, even to maintain our place as a scientific organization, it is necessary to have the active co-operation of every member.

Those who have a subject which can be treated in a paper, whether brief or long, should communicate at once with the secretary so that a practically complete program can be prepared at the next meeting of the Council, which will take place in a few weeks. Let no one think that because his work resulted simply as a part of his regular duties, that the subject would not be an interesting one to discuss with the section. The gathering of a few extra ideas from the other members will well repay anyone for the trouble of preparing a paper and, more than that, it shows the author to be a man who appreciates his obligation to the other members and is willing to express it by contributing his part to the general fund of information on which he himself has the privilege of drawing.

If this stone of the editor's fails to hit its mark, it will simply mean that the secretary will have to go gunning with a weapon of higher power and greater accuracy; so come across.

This significant remark was recently over-heard on the train, "If at first you *do* succeed—look out!"

CALENDAR TIME.

Just as sure as the leaves fall in the Autumn, is the advent of a number of calendars. Most of them come along about the first week in January but there are two which appear in October, and which we always look for with great interest. They are the calendar of the Ontario Pulp and Paper Makers Safety Association and the calendar of the National Safety Council. The reason we look forward to the receipt of these calendars is because it gives us an opportunity of doing a little bit in the ever present campaign of Accident Prevention which is such an important factor in pulp and paper mill operation.

The receipt of these calendars and the request for the prompt placing of orders for them should awaken a new interest in the safety battle and suggest new ideas for the campaign. The election of a new Government is a matter of no greater public obligation than the preservation of a whole and healthy nation of individuals.

The two calendars, while on the same general subject, are so entirely different in their conception and execution that there is really no overlapping but it is rather like two sledges pounding one after the other on the same spike. Reports indicate that this continual hammering, occasioned by the daily consulted message of the calendar, brings results. Perhaps the most important feature of the calendar is that it carries the message of Safety First into the home which is really the birth place of worth while ideas and good habits. It teaches a lesson to the children and it arouses in them an interest in the dangers that surround the father or older brother at work and by so doing, increases the sense of obligation on the elders' part, through the comments and questions of the little ones, to be careful. It emphasizes too, dangers of the street and the home, which are beyond the reach of the Workmans' Compensation Act and which yet cause probably a far greater aggregate of suffering than do industrial accidents.

The very demonstration of the goodwill on the part of a company to its employees should be a weighty argument in favor of the distribution of calendars. It suggests personal thought on the part of the management and it could be made an opportunity for a personal message to each employee. Apart from this happy result, there is also the economic side and there is no doubt but that it pays the company in the saving of accident indemnities and decreased lost production, to place a calendar in the home of every employee.

Proofs recently sent out by the office of the Ontario Pulp and Paper Makers' Safety Association, Room 14, Manning Arcade, Toronto, show constant improvement

in the quality of the calendar. The pictures are attractive, they are interesting, and they carry a message. The following is the schedule of prices F.O.B. Toronto: 1 to 10 copies, 25c each; 11 to 100 copies 22c each; 100 to 500, 20c each; over 500, 18c each. With orders for 300 or more, the name and address of the company will be printed on each calendar and, if desired, the text will be printed in both English and French. If this service is desired on orders of less than 300, a charge of $5.00 is necessary to cover the initial extra cost. It is particularly important that the secretary receive orders promptly.

Information regarding the N. S. C. calendar can be obtained from The National Safety Council, 168 No. Michigan Ave. Chicago.

CANADIANS ORGANIZED FOR TRADE.

In the British Trade News on another page of this magazine will be found a statement to the effect that a Canadian Chamber of Commerce has been organized in London. It is not so surprising that this Chamber has been organized as that it has not been organized sooner. Smaller countries than Canada and with a smaller export trade, have profited very considerably by establishing such bureaus which may serve as collectors of reliable information on trade prospects, reliability of prospective customers and as a rendez-vous for representatives of exporters when abroad. Such an organization is particularly needful where it is so necessary for countries to keep in close touch with one another as is the case with Canada and the Mother Country. Canadian firms are already doing a fair business with British concerns but there is no doubt but a far greater volume of trade would be accomplished if all of those interested in it would take a livelier interest and cooperate more vigorously in going after what business there is. The time has gone by when orders are handed out on a silver platter. Nowadays, they have to be dug up with a hoe and a good deal of hoeing is sometimes necessary before there is much to show for it, but the cultivation of the ground brings its own reward and the assiduous exporter is the one who will reap the benefits.

During the war the Government Trade Commissioner did excellent service and Canadian trade representatives are still doing good work. There appears to be, however, a particular field which neither the private individual or the Government Commissioner can effectively cover. It is here that an organization of manufacturers themselves can best serve their own interests by establishing such a cooperative bureau as a Chamber of Commerce. There are many proper functions for such an organization but one of the great benefits that should not be overlooked is the prominence and confidence that would thus be given to Canadian goods in one of our most important and most natural markets. It is to be hoped that the newly formed Chamber of Commerce in London will have the hearty support and enthusiastic cooperation of those who have a market in Great Britain or could supply such a market were they to assist in developing it.

COBWEBS.

We heard once of a penurious Yankee in Vermont who put off dying in order to save funeral expenses during the recent high cost period. The people of East Angus go him one better, in order to accommodate the editor of Brompton News. According to the last issue "Owing to the overcrowded condition of our columns, a number of births and deaths are unavoidably postponed this month."

GOOD WILL.

(From The Crest).

When you walk past the first newsboy in order to buy of another a block away—you give an example of the value of good will.

When your note is renewed without debate you are enjoying the credit advantage arising from your asset, good will.

When someone insists that a dealer supply your product as named, that is good will.

When reputation carries a man far in the front of the general line—good will has been one of the forces at work in his brain.

In all our human relationship there is in existence an invisible and intangible radiation, a heart wave or a brain thought or conviction which is called Good Will.

Endless it is in its ramifications and multiplications, the first few links, truly forged, are added to link by link in an endless chain. The growth goes on without end as long as hammer and anvil continue to ring with the sound of honest work, reputation and endeavour.

What is it worth?

It has been said that the Victor Talking Machine carry the good will item on their books at two dollars, but you couldn't buy it for two million. Others value it in various amounts, truly and otherwise.

Sometimes a competitor values good will at greater than one does one's self. He has to make progress against it and knows the hold it has upon the market.

Christmas day spread the idea of good will and Christmas is the most extensively advertised holiday throughout the world. It brings more money returns and more names to dotted lines than all the other holidays put together.

Advertising alone won't make "good will." No siree ! ! But no good product will ever reach its high point of good will value without continuous and far-reaching advertising of some kind.

From the Royal Bank magazine we read:

A judge of one of the United States courts, in a carefully-written opinion regarding a company which manufactured a popular and widely advertised product, declared that, on account of the good will of the public towards its trade-name, ". . . . if some mighty "catastrophe should destroy every vestige of the com-"pany's tangible property, it could go on again to-"morrow. And therein lies the great security of the "company's position. Good will is beyond the reach "of fire, or flood, or earthquake.

"Only the slow process of neglect can destroy it."

A Steel Company gives prominence to special features which are announced from month to month by tipping a slip on the covers of the house organs in which their announcement is made.

Jack Pine as a Pulpwood

Some time ago there was considerable comment on a newspaper article that was apparently inspired by the publication in the Pulp and Paper Magazine of a contribution by Mr. Frank Ritchie of the Wayagamack Co. Mr. Ritchie gave the results of an investigation into the use of Jack Pine for the manufacture of pulp; these indicated a possibility of wider use than is made of this wood at present.

The newspaper article is by "T.K.D." As some people interested in pulp and paper thought "T.K.D." a bit too optimistic regarding the actual qualities of Jack Pine as to length of fibre, etc., Mr. H. B. Stokes of the Forest Products Laboratories of Canada was asked for further information.

The effective utilization of this wood is an important matter and should be the subject of careful investigation and well worth the attention of such an organization as a National Research Institute.

"T.K.D." writes as follows:—

Who is Jack Pine? What is Jack Pine? Where is Jack Pine?

From the investors' standpoint, from the pulp and paper producers' standpoint and from the national standpoint, Jack Pine is quite a big fellow in his own particular way.

For generations of tree life, jack pine has been a sort of poor relation. It has been the weakling of the timber breed. But henceforth it will be quite an important member of the forestry family. Hitherto, jack pine has had a very indifferent place in the assets of the producing companies; it has had practically no place at all in the active operations. It has been used for the extraction of certain chemical properties, for railway ties, and for kraft wrapping paper—not a big market as timber markets go. And there are scores of millions of cords of jack pine. The woods are full of them, so to speak.

Jack pine, alias Banksian, alias Cypress, in the past has been a stubborn and reluctant servant of the pulp and paper mill; so much so that the expert woodsmen and mill operators deliberately ignored it as a means towards the end of pulp and paper making. Operators occasionally, inadvertently or with afore-thought, put jack pine into the stewing pot with the more respectable spruce and balsam, and always there was trouble—mostly pitch trouble. Jack pine, being a self-confessed culprit, was relegated again and again to the tall timbers.

Jack pine, it will be observed, has had a very bad name, and as a consequence was not invited to the daily dance of the wood-chips, or the jamboree in the mill digesters. Now we find that jack pine is not at all the sort of chap we thought he was. He has been exclusive, that is all. He can go into the digester, unaccompanied, and come forth a one-hundred per cent specimen of sulphite pulp, equal to the best composition requisite for the making of good and sturdy newsprint.

And this is the point: Most of the companies in which investors are interested have supplies of jack pine to the extent of 15 to 35 per cent of their standing timber areas. Most of these companies, in appraising the value of their physical assets, write the jack pine timber at, perhaps, less than one-half the value placed upon the timbers ordinarily used for the manufacture of pulp and paper.

My information is to the effect that in the Abitibi and the Mattagami companies' areas, for instance, jack pine represents over 15 per cent of the standing timber. Riordon, Price Bros., and North American Pulp run from 10 to 15 per cent. Brompton appears to have none. The St. Maurice River territory has 20 to 25 per cent of jack pine, while this timber on the Spanish River properties predominates all other classes of standing pulpwood. In the Upper Ottawa district, there are some 20 million cords of pulpwood, with jack pine giving an additional 3 to 4 million cords.

Thus, the available supplies of timber for newsprint production is some 15 to 25 per cent greater than has been estimated by the companies operating the areas. To put it another way, it has been estimated that the Province of Quebec has 155 million cords of paper-making timber. With the addition of jack pine the available resources will be increased to 185 million cords.

From experiments recently made, and successfully concluded by commercial as well as laboratory practice, the fibre from jack pine was found to be about 25 mm. longer than that of spruce fibre, which makes it particularly suitable for newsprint. The pulp made from jack pine proved to be as good as, if not better than, anything that can be purchased on the market.

It has long been an established fact that if jack pine is cooked in a mixture with other wood, trouble will result, owing to the fact that jack pine requires a stronger acid and a longer time for cooking than is required for other woods.

It is now an established fact that jack pine, cooked alone, will make a newsprint product equal to the best that has been coming from the Canadian mills.

Therefore, it is possible for those companies which in the past have been compelled to leave large areas of standing jack pine and cut further afield from their mills, to begin afresh near the source of manufacture, with several seasons' run of the near-by product, and thus reduce the average of the cost ratio by a very substantial and profitable margin. The clearing of those areas will also make available the shut-in balsam and spruce not economically workable in the past.

The additional advantage in respect to jack pine as a newsprint producer, is in the fact that the tree grows more rapidly than any other conifer. As a rule, it is peculiar to dry and sandy soil. Its powers of natural reforestation, after fire, are greater than any other conifer. On the average, jack pine attains twelve inches diameter, whilst a spruce grows six inches in the same period of growth. There are more cords per acre, on a given area of jack pine, than there would be even in black spruce, which probably has the speed record to date.

Incidentally, besides those companies already mentioned, Laurentide is high in jack pine holdings. The Provincial Mills and the Belgo Canadian have a high percentage of jack pine.

The causes which have kept this valuable timber from practical consideration are: a remarkable degree of ignorance; much prejudice; a modicum of laziness, and no doubt the fact that only too often is invention still-born when necessity has no need to function.

Clearly, the scientific and chemical resource which has brought jack pine within the scope of the paper-maker, has given to Canada's forests a renewed lease of life; while to investors has accrued an unexpected increment in the shape of increased physical assets, where a decrease might reasonably be expected through seasonable depletion of the reserves of what to date have been considered the only timbers suitable for paper production.

I am indebted to an article which appeared in a technical journal, from the pen of Mr. Frank Ritchie of the Wayagamack Pulp & Paper Co., which article prompted my investigation of the subject.

Mr. W. B. Stokes says;

During the past few months an article on the subject of Jack pine as a pulp-wood has appeared in a number of daily and weekly newspapers and technical journals published in all parts of the Dominion. I refer to the article entitled "The House Jack-Pine Built" written by T.K.D. which made its most recent appearance in the May issue of the Illustrated Canadian Forestry Magazine. Of course all Canadian subscribers to the Pulp and Paper Magazine are also members of the Canadian Forestry Association and can refer to the article referred to. There is no doubt that in spite of the light facetious manner in which the article is written it contains a great truth. Undoubtedly Jack pine is a pulpwood of considerable importance in Canada and can be used to great advantage in the manufacture of sulphite as well as sulphate pulp. A visit to some of the largest newsprint mills of Canada will reveal the fact that they are using very high percentages of jack pine in the manufacture of sulphite pulp.

In all the editions of the article by T.K.D. a curious slip is repeated. It is stated that "the fibre from jack pine was found to be 25 mm. longer than that of spruce." This is probably an uncorrected printer's error and intended for 25 per cent. The determination of fire-length is a very long and rather complex operation and much work has yet to be done before such such a definite statement should be made. Something has been done, however, and reference to the files of the Pulp and Paper Magazine and elsewhere give some idea of the true state of affairs.

In the issue of this magazine for May 16, 1918 Lee and Hovey stated that the fibre-lengths of jack pine and white spruce were as follows:

Jack pine 4.00 mm.
White spruce 3.10 " .

I do not know their authority for the fibre-length of jack pine but the fibre-length of the white spruce was determined at the Forest Products Laboratories under the direction of H. N. Lee. In view of subsequent work the value given above for jack pine should be ignored.

In the Pulp and Paper Magazine for October 2, 1919, Kress, Wells and Vance give the following values:

Jack pine 2.5 mm.
White spruce 2.8 "

In the Pulp and Paper Magazine for October 28, 1920 Ritchie quotes values obtained by A. D. Little, Inc. as follows:

Jack pine 2.26 mm.
White spruce 1.92 "

About 25,000 measurements of fibres of various Canadian trees have been under supervision of H. N. Lee at the Forest Products Laboratories of Canada but have not yet been published. A reference to the results reveals the following average fibre-lengths:

Jack pine 2.37 mm.
White spruce 2.87 "

The value given for white spruce is an average for three trees and includes the tree from which the value 3.10 mm. was obtained in 1918 as already mentioned.

It would appear from these more extensive determinations, therefore, that the fibre-length of jack pine is somewhat less than that of white spruce. The difference is not sufficient however to justify any remark to the effect that jack pine is on that account unsuitable for sulphite pulp. The practice of some of the largest Canadian mills demonstrates that jack pine is most valuable for the purpose.

While still on the subject of jack pine I would like to add something to T.K.D.'s eulogy of this peculiarly Canadian timber. Jack pine is of very great importance for railway ties. The proper methods of creosoting ties of this wood have been determined at the Forest Products Laboratories of Canada. The use of this tree for mine timbers has made it important to test its strength in that form and its use as lumber, which is increasing, makes the results of tests on small clear specimens of considerable value. Such tests on mine timbers and on small specimens have been made by the Division of Timber Tests at the Forest Products Laboratories of Canada and the results show that the strength of jack pine has been generaly underestimated. Jack pine was, of course, shown at the Empire Timber Exhibition held in London last July and the writer found that, although some Canadians affect to despise it, yet it had already made many friends in Great Britain.

In addition to the contributions to the subject, the folowing is an account of jack pine as given in a work issued from the Forest Products Laboratory of Madison, Wis., in regard to the suitability of various species of American woods for pulp and paper production:—

JACK PINE—Pinus divaricata. Wt. 24 lbs. Fibre 2.5 mm. **Range**—New Brunswick to New Hampshire and west through Great Lake and Hudson Bay (Southern shores) region to Great Bear Lake, Mackenzie river, and Rocky Mountains; Indiana and Illinois, and central Minnesota.

Common Names—Scrub Pine (Me. Vt., N.Y., Wis., Mich., Minn., Ont.); Gray Pine (Vt. Minn., Ont.); Jack Pine (Mich., Minn., Canada); Princess Pine (Ont.); Black Jack Pine (Wis.); Black Pine (Minn.); Cypress (Quebec to Hudson Bay); Canada Horn-Cone Pine (Cal. Lit.); Chek Pine; Sir Joseph Bank's Pine (Eng.); "Juniper" (Canada); Banksian Pine (lit.).

Sulphite Pulp—
Yield 1,080 lbs. Very difficult to bleach.
Not easily pulped—fair strength—poor color.
Pulp shivey and full of pitch.
Possible uses—Mechanical difficulties when running this pulp over the paper machine prevent its use.

Sulphate Pulp—
Yield 1,150 lbs.
Character—very strong tough fibre.
Possible Uses—Similar to white spruce.

Mechanical Pulp—
Yield 2,130 lbs.
Character—Gray, somewhat soft, good strength, pitchy, poor finish.
Possible uses—Medium grades of groundwood.

Production Chart for Newsprint

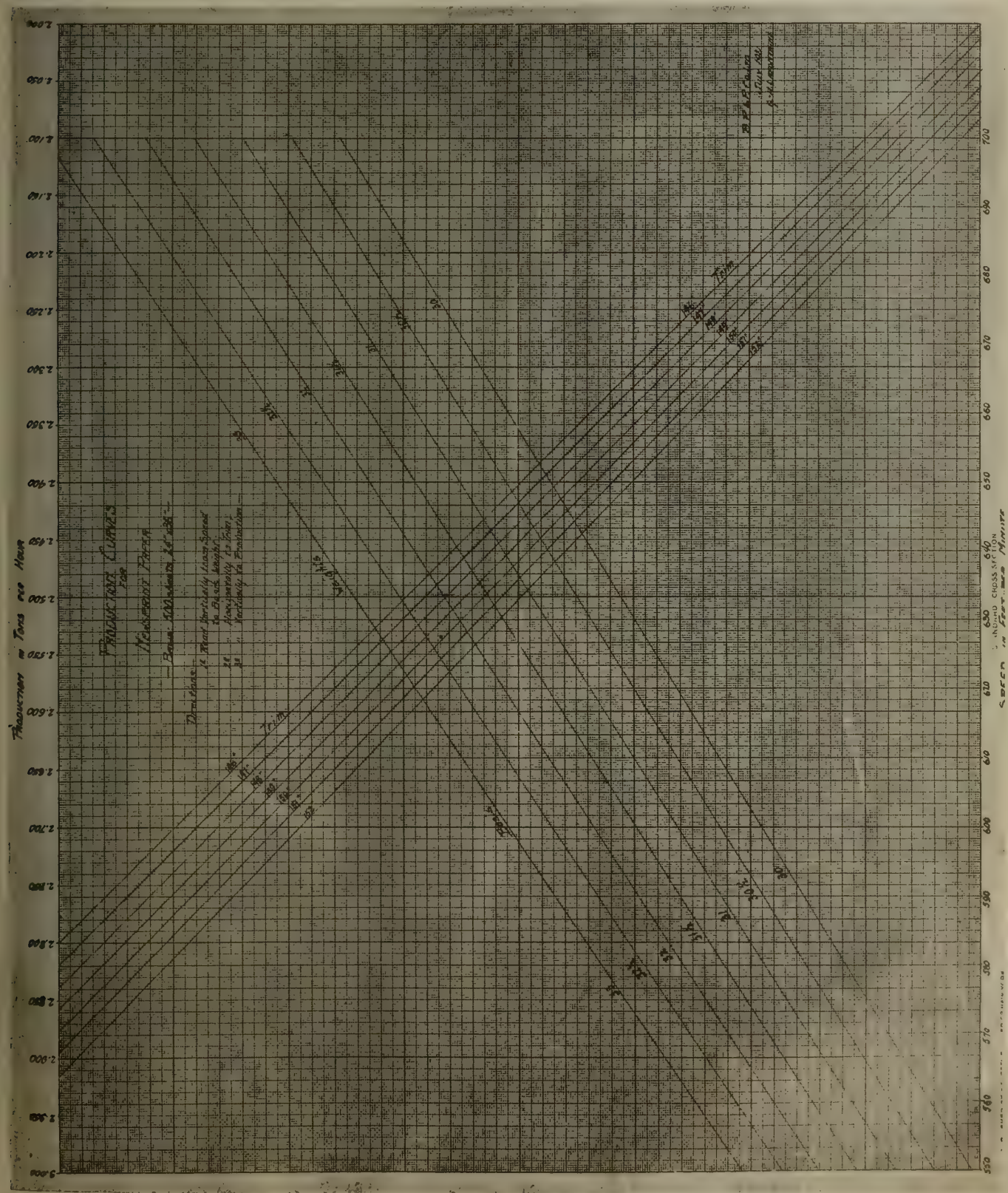
By Gerard H. Lafontaine, Brompton Pulp & Paper Co., Ltd.

This chart was made out at the request of the Cost Department as a time-saving device. It proved afterwards to be also very useful to the superintendent and machine-tenders who can by its use ascertain at a glance the ideal production of the machines.

Similar charts can be made out for other kinds of papers, cardboards, etc., from the well-known equation:

$$P = K \times S \times B \times T$$

where P = production in tons per hour
K = a constant which varied with the standard size of the sheet and the number of sheets to the ream.
S = speed in feet per hour
B = basis weight in lbs.
T = Trim in feet.



British Trade News

(From Our London Correspondent.)

The importance of establishing a fire-fighting squad in a paper mill has been amply demonstrated during the past week at the Croxley Paper Mill, in Herts, which is owned by John Dickinson & Co., Ltd. A fire broke out in a building filled with esparto grass and wood pulp, and in a twinkling the mill fire-fighters were at it. They tackled the outbreak with great ingenuity and with a plentiful supply of water it was not considered necessary to call the assistance of fire brigades in the district, which proved a financial saving to the firm. It is estimated that 550 to 600 tons of esparto and pulp were in the building and the mill fire-fighters confined the flames to one buiding, thus preventing the work of the mill being stopped and business being interrupted. It is considered a smart piece of work and goes to prove that in the end there is nothing like a quick fire-fighting squad and a proper supply of water to fill the hose when flames break out in any part of a mill.

New Offices.

The Anglo-Canadian Wax Paper Co., Ltd., whose offices were at the Watford mills, announce that they have installed themselves in new offices in London at 5, Tudor St., E.C. 4. This means more consolidation of business as people visiting London will now be in a position to call at the offices whereas in the past it meant a run on the electric trams out to Watford.

Lord Beaverbrook Grieves.

Lord Beaverbrook, who sometime ago was enjoying some cool bathing at Deauville, in France, has again had criticism hurled at sellers of newsprint. He is interested in the London "Daily Express," but he selected the "Sunday Express" for his reference to events in the newsprint industry since 1919. "In that year," he states, "there was a regular panic about the supply of newsprint. Not only was there an actual scarcity, but this scarcity was greatly exaggerated in the minds of the buyers concerned. Publicists conjured up in their minds the bleak picture of a day when they would be no longer able to feed the roaring, hungry, presses with the daily meal of newsprint, and when the subscribers in the morning would ask for their favorite journal in vain. So much is the reading of the public a matter of acquired habit that a newspaper which suspends publication signs its own death warrant. Its Kingdom is taken from it for ever and given to some Mede or Persian over the way. The newsprint buyers, therefore, tumbled over one another into the market to secure their future. Prices went soaring up sky-high. It was a great era for the newsprint manufacturing trade. In 1914 newsprint cost £10. In 1919 the ton was sold for £60. Such an inflated price could not, of course, last but the trouble did not end with an increase in the newsprint supply. In their nervousness of the future the buyers allowed themselves to agree to long contracts, lasting in many cases right into 1927. In other words, though newsprint can now be bought freely in the open market at £20 a ton, the newspapers with contracts are still paying £35 to £40 a ton. Such conditions are a tremendous handicap to any venture."

Another Statement.

Some of the papermakers would like to know where the mills are that are benefitting by these 1926-7 contracts. But in April 1921 Lord Beaverbrook put his signature with that of Sir Edward Hulton, of the "Daily Sketch" to a statement in the "Manchester Guardian" to the effect that "The statement that the manufacturing industry is selling here below cost price is perfectly true." The further suggestion that this state of affairs is due entirely to competition from European debtor countries needs qualification. It is also due to the fact that manufacturers are working off raw materials (ground wood and chemical pulp) bought in foreign countries under contract at the very high prices of last year. At the best these contracts will not run out till June 1922, but the materials have to be used at some time or another and the consequent losses faced." It is quite true that English paper mills have purchased raw materials for forward delivery in accordance with their usual practice, just in the same way as big newspapers enter into forward contracts for newsprint. But Lord Beaverbrook has already been told that British mills were prepared to stand the loss involved by liquidating their raw materials purchased at high prices if they could run their mills at full time, and he was further informed that many British and Irish publishers had brought their foreign newsprint for forward delivery over 1921 at prices nearly double that at which British mills were selling. The contracts were made in 1920 with mills in Sweden, Norway, and Finland. Consequently publishers are no more subject to criticism than the British paper mills are for purchasing raw materials ahead. It would be a grand move for Lord Beaverbrook if we could do what the Germans have done, viz., the Government cut and supply pulpwood to the mills for two years at prices which are half the lowest figures for similar pulpwood in Canada, Newfoundland, Sweden and Norway. When the paper was produced publishers and consumers got it at a price below the cost of the raw material and the balance exported, the additional price obtained for the exported quality being divided between the German Government and the German mills. This is what Lord Beaverbrook would like; it is not trading—it is politics and ruin for the workpeople.

The Safeguarding Act.

If any British manufacturer wants to get any imported article brought under this Act the following preliminary information must be first submitted to the Board of Trade: (1) name of article and full particulars of sale; (2) country or countries of origin; (3) particulars and evidence as to price sold, or offered, in the United Kingdom; (4) evidences as to price at which similar goods can be profitably manufactured in the United Kingdom; (5) evidence to show that the depreciation in relation to sterling of the currency of the country of manufacture is responsible for the fact that the prices at which goods are sold or offered for sale in the United Kingdom are below the prices at which similar goods can be profitably manufactured in the United Kingdom; (6) evidence as to the extent to which by reason of the sale, or offer for sale, employment in any industry in the United Kingdom is being or is likely to be seriously affected. When this information is furnished and a prima facie case made out, the Board of Trade will appoint a committee to go into the complaint, report, and the Board will do the rest.

The Canadian Chamber of Commerce.

Some time ago I made a brief reference to the Canadian Chamber of Commerce in London. The object of this Chamber are briefly the encouragement and promotion of Anglo-Canadian trade and Commerce, the development of Canadian industries by British capital, and generally the furtherance of Canada's interests in

the United Kingdom. Canadians in England are asked to get in touch with the Chamber or the Secretary Mr. R B. Stewart, Canadian Chamber of Commerce in London, 55 Holborn Viaduct, E.C. I am very pleased to see this new body established and I would advise all pulp and paper men to make use of it The Swedes and Norwegians have very successful chambers here—they miss nothing, either in publicity or otherwise—and are very keen in studying the interests of their own countries. It is to be hoped the Canadian Chamber will be as useful, but to make it so those in the Dominion must utilize it.

News From Europe

(Compiled in London by Dr. Paul Bartholow especially for the Pulp and Paper Magazine.)

Proposed Color Scale For Printers' Inks.

It is now realized that inks used in printing and the graphic arts should be classified, i.e., the colors used should be reduced to a scale or orderly system of tones, the various shades of which, being almost innumerable and incapable of definition, must therefore be designated by numbers and indexed for purposes of matching. The study of color in its relation to inks is regarded as "imperatively needful" by the Dye Commission now sitting at Leipzig, who, with Professor Oswald's help have been engaged in the determination of eminently practical questions, the fastness of these inks to light, water, oil and air, resistance to heat and other fixed qualities. The meeting voted to adopt Oswald's scheme of color orders. Apart from scientific interest the proposed scale has great practical importance.—Papier Zeitung, September 1, 1921.

24 Hours A Day Mills.

The Frankfort Messe or Fair has proved a brilliant commercial success and the newspapers gleefully describe the rooms in which the show is made to crowds of buyers from Italy, Holland, Switzerland, England, and the United States. Besides these indications correspondents hear many evidences of German industrial prosperity. For instance a Kulenbach spinning mill is working 24 hours a day in 8 hour shifts. Such a case may not be common, but it is incontestable that workmen are busy 12 hours a day in the paper and textile mills, working under the stimulus of fictitiously high wages. The manufacturers, on their side, are profiting, since wages on the whole have not kept pace with the increase of prices, and paper makers therefore in value are actually paying less for labor than in 1914. Moreover by an odd coincidence trade improves with the fall of the mark, and the incredibly cheap prices of paper and other products at the Fair have attracted a flock of foreign buyers who are pulling out enormous orders. In short the Frankfort Messe is being called the tower of German industry. "It is not to be denied," says a leading trade journal, "that the position of German paper at the present time is favorable."—Handel-Zeitung, September 1921.

Overproduction of Paper.

The balance-sheets of the larger paper mills in Europe, especially in countries, like Finland, which do a relatively great export business, show the extraordinary vicissitudes to which the industry seems to be periodically liable. In the case of Finland the sudden closing of outside markets, an accident which should teach shrewd and farseeing men that momentary triumphs ought not to obscure the facts of industrial overproduction, has left the mills with an unwieldy accumulation of surplus stocks. Partly in consequence of this overproduction, partly, too, for other reasons, the largest mill in Finland, the Kymmene, A.G., has severed its connection with the Finnish export cartel, while it is also announced that a new association is contemplated, if not actually in operation with a view to finding wider markets in America and Russia. The exceedingly startling fluctuations in paper exports could not be revealed more strikingly than in Finland's export figures; these are in tons, with 1920 figures in parenthesis:

Wood pulp, 5,365 (31,986); Sulphite, wet 2,006 (1,986); dry 18,366 (29,366); Sulphate, wet, 35 (296); dry, 3,034 (12,986); Newsprint, 35,144 (44,798); Wrappings, 3,459 (11,629); Writing paper 1,153 (2,862); Tissue 355 (931).

To make other markets, since former ones have proved unsatisfactory, Finnish makers have adopted a scheme which will evolve the necessary organization. To this plan all the mills, including Kymmene, have acceded, with its main section known as the "Finnish Paper Bureau," or office of the new "Finnish Paper Union." It is clear that Finnish manufacturers, in nowise dismayed by the set backs to trade, are actively engaged in building up the agency necessary to take over the task of marketing Finnish paper and pulp in all parts of the world.

Prospects of the Paper Industry in Poland.

It is highly probable, according to reports from Austria, that Poland will be able to develop its resources so as to cover the needs of the population in the matter of book and print papers. The country possesses a plentiful supply of the raw materials for paper making, and coal of good quality is also to be had if it is wanted. The new Polish State, however, has few mills and machines in operation. They are enumerated today as follows:

17 paper mills with 33 machines.
1 Pulp mill, and
6 Board mills.

At present the output consists chiefly of fine writing and print papers, ordinary news and packing paper, tissue and cigarette paper, boards of various kinds. The question of whether Poland will continue to depend upon other countries for paper is one which appears easier to answer today than it was, because there is an unexpected movement towards a large scale business with neighboring states, notably Germany and Austria. Poland, it is to be noted, acquired a number of districts which were industrial developments of Germany, and with these a considerable class of skilled workers. In view of the slackness of industry in Norway and Sweden, upon which Poland drew for paper, manufacturers in Germany and Austria are keenly interested in supplanting these and other countries in the Polish markets. They state openly that the prospects of paper making in Poland are "favorable" provided pusiness is allowed to have its way.—Zentral blatt für die Papirindustrie, Vienna, September 1, 1921.

The sulphate mill of the Brompton Pulp & Paper Co. at East Angus, Que., the first of its kind on this continent, has been given a thorough overhauling. Production has been increased to 90 tons per day without installing any new machinery.

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. New Australian Pulpwood. World's Paper Trade Review, lxxv, 25, p. 2216, June 24, 1921. Queensland silky oak is said to be the best Australian pulp so far examined for papermaking.—A. C.

A-3. Paper and Industrial Alcohol. World's Paper Trade Review, lxxv, 25, June 24, 1921. Sir CHARLES BEDFORD has contemplated the use of elephant or Savannah grasses and of (chiefly) immature bamboos as a joint source of alcohol and paper, having initiated and directed experimental work on these materials on the laboratory and distillery scale. He mentions rice straw as a raw material. — A. C.

A-3. Bamboo Once More. Paper Making, xl, 6, p. 188, June, 1921. An account of the different processes that have been patented for cutting and crushing bamboo in preparation for treating it chemically. Experiments have proved that a high class paper can be produced from bamboo pulp.—A. C.

A-3. Retting Fibrous Straw. Can. patent No. 209,465, JAMES M. MASSON, Duluth, Minnesota, U.S.A., March 15, 1921. The straw is retted by submerging and boiling in a solution composed of 1 fl. oz. per gal. of sulphonated castor oil, 1 oz. of pure alkali and 1 oz. of triphosphate of soda; and is then removed and washed for further treatment. Claims allowed 8.—A. P.-C.

A-3. Retting Plant Fibers. Can. patent No. 200,481, LOUIS PEUFAIILIT, Lille, France, March 15, 1921. Fibers from plants intended for being worked in spinning and paper mils are subjected within an open or closed vessel, at a high temperature, to a treatment with a liquid composed of ethylene dichloride, ethylene trichloride, ethylene perchloride, dimethyl tetrachloride or dimethyl pentachloride, cured in pure water, either separately or mixed together. The dissolving substance instead of being dissolved in pure water may be dissolved in solutions of soap, or in oily emulsions, or in water to which is added 3 percent of petroleum. Claims allowed 3.—A. P.-C.

A-11. English China Clay and the American Market. Paper Making, xl, 6, p. 186, June, 1921. English coating china clays make up a very large proportion of all the clay imported into the United States and though it would appear wise for the paper trade to favor a duty on filler clays, since there is no tariff proposed on finished paper, it would be manifestly unfair to the American book paper manufacturers.—A. C.

B-5. Chain Saw. Can. patent No. 209,491, CEPHAS P. SLY, Orchard Park, New York, U.S.A., March 15, 1921. Claims allowed 9.—A. P.-C.

B-5. Power Tree Feller. Can. patent No. 209,475, PAUL B. NEUMAN, Hathersage, Alberta, Canada, March 15, 1921. Claims allowed 7.—A. P.-C.

B-5. Tree Sawing Machine. Can. patent No. 209,482, THOMAS G. PERKINS, Seattle, Washington, U.S.A., March 15, 1921. Claims allowed 8.—A. P.-C.

C-6. Saw Guard. Can. patent No. 209,722, HOMER J. TRAVER, Kerhonkson, N.Y., U.S.A., March 22, 1921. Claims allowed 8.—A. P.-C.

C-7. Suspension Means for Barking Drums. Can. patent No. 209,502, PEDER PETERSON WESTBYS, Peterborough, Ont., Canada, March 15, 1921. Claim allowed 1.—A. P.-C.

C-7. Apparatus for Loosening Bark from Pulpwood. Can. patent No. 209,600, GEORGE P. BERKEY, Appleton, Wis., U.S.A., March 22, 1921. The wood is made to pass through a tank of warm water, and is kept completely submerged during passage through said tank. Claims allowed 3.—A. P.-C.

C-7. Wood Soaking Tower. Can. patent No. 209,530, THE FIBER MAKING PROCESSES, assignee of HERBERT GUETTLER, both of Chicago, Ill., U.S.A., and OLE LUDWIG, Port Edwards, Wis., U.S.A., March 15, 1921. Before being barked, the logs are passed through a tower in which they are sprayed with water or other liquid. Claims allowed 10.—A. P.-C.

D-4. Pulpwood Grinder. Can. patent No. 209,820, JAMES H. BAKER, Saratoga Springs, New York, U.S.A., March 29, 1921. Claims allowed 11.—A. P.-C.

E-2. Sulphite Waste Liquors for Fuel Briquettes. Can. patent No. 209,629, CARLETON ELLIS, Montclair, N.J., U.S.A., March 22, 1921. The finely divided fuel is mixed with finely divided solids of sulphite waste liquor (dried by atomization) and lime, and sufficient water is added to produce a plastic mass. The sulphite liquor and solids react in the presence of the water to form an insoluble binder. Claims allowed 4.—A. P.-C.

E-2. Precipitating Organic Solids from Sulphite Waste Liquor. Can. patent No. 209,881, HANS BRUN LANDMARK, Drammen, Norway, March 29, 1921. The waste liquor is introduced in an autoclave where the sulphonic acid combinations are broken down by means of a strong acid, while the liquor is under pressure. This stronger acid may be produced either previously to or during the precipitation by oxidizing the SO_2 contained in the liquor. The oxidation is produced by introducing ozonized air or oxygen into the autoclave and discharging electric sparks. Claims allowed 2.—A. P.-C.

F-2. Black Liquors from Bamboo. World's Paper Trade Review, lxxv, 22, p. 1938, June 3, 1921. A continuation of the discussion on W. RAITT's paper read before the Royal Society of Arts. Mr. Sindall, in the comments which he added to the paper, deals with the treatment of the black liquor.—A. C.

F-0. Production of Fibrous Material. Can. patent No. 209,444, MARTEN HOFSTE, Amsterdam, The Netherlands, March 15, 1921. Fibrous material is prepared from the stalks and other parts of plants, especially of plants with a hard woody rind or bast, such as ramie, by producing in the vegetable material by chemical means a gas, by which, in addition to the chemical action to which the material is subjected, the fibers are mechanically laid bare. The material may be first treated with an alkali and then boiled in a bath containing about 25 percent of an ammonium salt. Claims allowed 8.—A. P.-C.

G-8. Felting Machine (wet machine). Can. patent No. 209,688, CARL GEBHARD MUENCH, St. Paul, Minn., U.S.A., March 22, 1921. Claims allowed 6. — A. P.C.

K-6. Purifying Cottonseed Hull Fibers. Can. patent No. 209,529, THE EAST ST. LOUIS COTTON OIL COMPANY, National Stock Yards, Ill., assignee of FRANK W. STOCTON, Pittsburg, Pa., both in U.S.A., March 15, 1921. The cottonseed hull fibers are purified by boiling in a 4 percent caustic alkali solution for about five hours, to soften the hull particles, passing the boiled fiber between rolls thereby mashing and disintegrating the hull particles, and finally subjecting the mashed material to a cleaning operation to separate the fine disintegrated hull particles from the fiber. Claims allowed 6.—A. P.-C.

K-6. Cottonseed Fibers. World's Paper Trade Review, lxxvi, 2, July 8, 1921, p. 118. A scheme for extending the use of cottonseed fibers in papermaking. —A. C.

K-7. Beating. World's Paper Trade Review, lxxvi, 2, July 8, 1921, p. 142. The places of disintegration and circulation.—A. C.

K-10. Rosin or Engine Sizing. C. C. SCHNEIDER. **Paper Making,** xl, 6, p. 182. A paper giving general description of process, read at a meeting of the American Pulp and Paper Mill Superintendents' Association.—A. C.

K-12. Knife for Paper making Machine. Can. patent No. 209,907, CHARLES E. POPE, Springfield, Mass., U.S.A., March 29, 1921. Claims allowed 11.—A. P.-C.

K-12. Drainer for Moist Webs. Can. patent No. 209,-992, THE SHERBROOKE MACHINERY COMPANY, Ltd., Sherbrooke, P.Q., Canada, assignee of ANTON J. HAUG, Nashua, N.H., U.S.A., March 29, 1921. The patent covers the use of a perforated press roll, the water which is pressed out of the sheet passing through the perforations of the roll. Claims allowed 14.—A. P.-C.

K-12. Electric Drive for Paper Machines. Can. patent No. 209,956, THE CANADIAN GENERAL ELECTRIC COMPANY, Ltd., Toronto, Ont., Canada, assignee of WILBUR L. MERRELL, Schenectady, N.Y., U.S.A., March 9, 1921. Claims allowed 7. (For description see **Pulp and Paper,** xviii, 915-6, Sept. 2, 1920. Abs.)—A. P.-C.

K-12. Felt Cleaning. World's Paper Trade Review, lxxv, 25, June 24, 1921, p. 2214. A British patent has been granted to CHARLES WALMSLEY and Company, Ltd., Bury, and JOHN LAW, Markinch, Scotland, on a process for cleaning felts. In the invention high pressure water in the form of a thin continuous sheet is caused to impinge on the felt of a paper machine to remove china clay, paper fiber and similar dirt from the nap of the felt.—A. C.

K-12. Recent Developments in Papermaking. T. D. NUTTALL. **Paper Making,** xl, 5, p. 140, May, 1921. An account of the developments which have taken place during the recent years, in the width and speed of the paper machine.—A. C.

K-12. Drying Paper. World's Paper Trade Review, lxxv, 24, June 17, 1921. A British patent has been granted to O. MINTON covering a method and apparatus for drying paper and other materials in sheet form.—A. C.

K-12. Suction Drying Roll. Can. Patent No. 209,-323, THE DOMINION BRIDGE CO., Ltd., Lachine, assignee of HENRY H. VAUGHAN, Montreal, Quebec, Canada, March 8, 1921. Claims allowed 4.—A. P.-C.

K-18. Fiber Board. Can. patents No. 209,835 and 209,836 MANLEY CHEW, Midland, Ont., Canada, March 29, 1921. Chip waste is steamed, water is added to the mass which is beaten and screened; a hairlike binder is introduced and the fibrous mass is rolled so that the fibers are more or less drawn out longitudinally, agitated in a tank, and fed to the machine. Claims allowed 5 on each patent.—A. P.-C.

K-18. Corrugated Fiber Board. World's Paper Trade Review, lxxvi, 2, July 8, 1921, p. 146. Effect of age on the bursting strength of board.—A. C.

K-18. Indented Fiber Board. Can. patent No. 209,-470, CARL GEBHARD MUENCH, St. Paul, Minnesota, U.S.A., March 15, 1921. Claims allowed 5.—A. P.-C.

K-20. Sheet Rubber Liner. Can. patent No. 209,322, THE DIAMOND STATE FIBER CO., Bridgeport, assignee of AUGUST MARTIN EDWIN STRIJFFERT, Morristown, Pa., U.S.A., March 8, 1921. The patent covers as a new article of manufacture a laminated structure consisting of alternate layers of rubber and a separate covering of relatively tough, pliable, glycerin-treated, chemically parchmentized vegetable fiber, the latter adhering more strongly to one face of each layer of rubber than to the face of the second rubber layer with which it is engaged. Claims allowed 3.—A. P.-C.

K-23. Reenforced Paper Article. Can. patent No. 188,347, PAUL POETSCHKE, Milford, Delaware, U.S.A., Jan 21, 1919. The paper is reenforced by means of a magnesium oxychloride cement and waterproofed by an external application of a waxy water repellent material. Claims allowed 7.—A. P.-C.

K-0. Paper Deterioration in India. World's Paper Trade Review, lxxv, 23, June 10, 1921. Examination of the various libraries in India show that folding the paper once or twice will cause it to break. This perishing as it is called, is due to hydrolysis of the cellulose molecules of the paper and their later decomposition into simple substances rather than to a process of oxidation. The type of paper found to be most resistant in India is a rag paper, the fibres of which have not been weakened in the process of manufacture. Treatment which has been found to damage the fiber is prolonged digestion with alkali, over-bleaching, non-removal of the last trace of bleach by antichlor and imperfect washing that leaves traces of acid in the paper, while rosin and filling material should not exceed a small fixed percentage. It is recommended that all books and documents of permanent value should be removed to libraries in hill stations with temperate climates, or placed in special buildings in which complete air control can be maintained.—A. C.

L-4. Manufacture of Paper Containers. Paper Container, v, 1, July 1, 1921. The nineteenth article of a series dealing with the manufacture of paper containers.—A. C.

L-4. Corrugated Boxes. Paper Container, v, 1, July 1, 1921. An article completing the description of the various kinds of corrugated boxes referred to in the pamphlet issued by the National Association of Corrugated Fibre Box Manufacturers, U.S.A., — A. C.

L-5. Nitrocellulose from Baobab. Fr. patent No. 504,614. THOMSON, SEVERN and TWYCROSS, April 2, 1918. **L'Industrie Chimique,** vii, 361 (Oct. 1920). Baobab wood possesses the same properties as cotton for the purpose of nitration, for it is composed of almost pure cellulose and is highly fibrous. The fibers when examined under the microscope are quite similar to those of cotton and behave similarly when nitrated.—A. P.-C.

L-5. Cellulose Acetates. Fr. Patent No. 505,608, J. O. ZDANOWITCH, October 31, 1919. **L'Industrie**

(Continued on page 1105)

SEPT. 1921 NEWSPRINT EXPORTS BEAT SEPT. 1920.

Canadian pulp and paper exports for September reached a value of $9,457,027 a decline of $7,033,665 as compared with September 1920 and an increase of $51,636 over the preceding month of August. Exports of newsprint for the month amounted to 1,224,136 cwt. compared with 1,212,225 in the corresponding month last year, an increase of 11,911 cwts. (595 tons) over last year, showing that, contrary to some reports, Canadian newsprint is not losing its foregn markets to European competition, although increased Canadian productive capacity should also be taken into consideration in comparing this year's exports with last. The month's figures indicate a continuous of the steady upward movement which has followed the drastic decline in April, with the exception of the month of June, as shown in the following table:—

March	$12,407,476
April	6,946,236
May	7,931,525
June	6,788,932
July	8,666,556
August	9,395,391
September	9,457,027

The month's exports were made up as follows:—

September 1920.	
Book paper 3,291 cwts.	$ 32,609
Newsprint 1,212,225 cwts.	6,542,179
Other paper	1,280,705
	$7,855,493

September 1921.	
Book paper 810 cwts.	$ 9,432
Newsprint 1,224,136 cwts.	5,503,368
Other paper	261,807
	$5,765,607

September 1920.	Volume	Value
Sulphate Pulp	274,190	$1,398,092
Sulphite, Bleached	222,306	1,999,016
Sulphite, Unbld.	513,526	3,361,048
Groundwood	424,689	1,877,053
	1,434,711	$8,635,209

September 1921.		
Sulphate	225,515	$ 753,418
Sulphite, Bleached	118,515	492,471
Sulphite Unbld.	238,686	762,439
Groundwood	658,027	1,574,042
	1,239,820	$3,682,420

Countries of destination were: Paper —United Kingdom, $116,591; United States, $5,249,548; other countries, $408,468. Pulp — United Kingdom, $1,221,245; United States $2,175,937; other countries, $285,238.

Comparative figures for the first six months of the current fiscal year show:

	Paper	Pulp	Total
1921	$33,379,508	$15,804,159	$49,183,667
1920	43,025,764	44,217,712	87,243,476
1919	27,119,246	16,626,726	43,745,972

Pulpwood amounting to 49,608 cords, valued at $664,420, was exported to the United States in September 1921, compared with 151,541 cords valued at $2,046,864 in September 1920. For the six months period the volume and value of pulpwood exported to the United States was: 1919, 515,444 cords, $5,089,693; 1920, 653,856 cords, $7,803,332; 1921, 421,388 cords, $5,546,785.

BOOK REVIEW.

Chemical Engineering Catalog.

The sixth annual edition of the Chemical and Engineering Catalog is a distinct credit to the Chemical Catalog Company, 1 Madison Avenue, New York City, which originated the idea and has carried it out so successfully as to make this publication one to be anticipated with interest. Its helpfulness to concerns associated with the manufacture and use of chemicals and related equipment, is shown by the circulation of 11,500 copies. There are slightly fewer pages than in the catalog of last year but considering the general business situation, there is distinctly a considerable relative improvement over the last edition. One point to notice is that there has been a steady increase in the number of pages used by each firm which indicates either that manufacturers and others have more goods to advertise or that they are awake to the advantages of properly advising the public of what they have to offer.

The publishers have made some improvements in the make up of the book, particularly in the use of a thinner paper, which reduces the weight of the book by several pounds, and by the use of a flexible pseudo-leather cover which is at once more durable and more pleasing than the former style.

Lest anyone consider that the chemical catalog is simply a composite catalog of apparatus and supplies, we wish to point out the very extensive list of technical and scientific books. The illustrations are good throughout and the very satisfactory appearance of cuts showing photomicrographs, indicates the eare that has been taken with the manufacture of the book. Taking it on the whole, we consider that the 1921 edition of the Chemical Engineering Catalog will be of almost daily assistance to the purchasing agent, the engineer, and the manager of any concern using chemicals or the apparatus required for carrying out manufacturing operations based on chemical reactions.

The Catalog is leased at $2.00 per copy, for the period of one year, to those included in the following-named classifications, with the understanding that upon publication of the succeeding volume this copy is subject to recall.

1.—Chemical Engineers, Works Managers, Superintendents, etc.

2.—Consulting, Designing and Constructing Engineers in Chemical lines.

3.—Chief Chemists of Industrial and Research Laboratories.

4.—Heads of Chemical Departments in Universities, Colleges and Technical Schools.

5.—Technical Departments of the United States and Foreign Governments, and Libraries.

6.—Foreign Chemists and Engineers.

To those not included in the above classes a charge of $10.00 a copy is made for the volume. Eleven thousand five hundred copies of this edition have been printed for distribution.

W. G. MACNAUGHTON INJURED.

The Pulp and Paper Industry will learn with regret, that Mr. W. G. MacNaughton was seriously injured last week in an automobile accident and is now in a critical though not hopeless condition, at the Western Hospital, Montreal. Mr. MacNaughton is well-known as having been a chemical engineer on the staff of the Forest Products Laboratory, Madison, Wis., Chemist for the Inland Empire Paper Company, and Superintendent, while construction was taking place, for the Spruce Falls and Paper Company.

PULP AND PAPER NEWS

The keenest interest is being evinced in pulp and paper circles in the latest development in the affairs of the Riordon Company, Ltd. Through Mr. Carl Riordon, its president, the company has applied to the trustee acting on behalf of the creditors for a year's extension of time for payment of its debts, and a meeting of the creditors has been called for the 17th of next month for consideration of the Company's proposal. The object of this year's extension of time which is being requested is to enable the operation of the Kipawa plant, which was started last Friday, to be continued without interruption. If the creditors decide to grant this extension, the result will be that, by the end of the next twelve months, most of the Kipawa wood pile, if not all of it, will have been converted from soft wood into hard cash, and the Company's total indebtedness will have been reduced by the amount of hard cash realized with the further consequence of a considerable improvement in the prospects of ultimately effecting a satisfactory settlement. On the other hand, if the creditors refuse to accede to the Company's proposal, the present unsettlement will continue, the Kipawa plant will continue to be operated on sufferance, with all the obvious disadvantages that such operation must entail, and with the prospect that at any moment, arbitrary action on the part of a creditor may bring on a crisis and cause a general wind-up of the affairs of the Company.

The reopening of the Riordon Company's Kipawa plant last week is an event of importance to the pulp and paper industry generally. In itself, it is an evidence of an improved demand for sulphite. Further, it looks likely to improve the outlook for that sorely-harassed Company. And, finally, on grounds that are more or less intangible, it will impart greater strength of tone to the whole pulp and paper industry.

Among the exhibits at the Convention of the U. T. A. which covered the entire mezzanine floor of the King Edward Hotel, Toronto, the one which attracted the most general interest was what is claimed to be the smallest paper-making machine in the world. It was seen in operation, and on the first paper produced, invitations were printed for the Mayor and Council of Toronto, and the student at the School of Practical Science and the Technical Schools to view the machine. The machine in question was made in Germany and was smuggled out of the country after the war. Lord Northcliffe wanted to buy it, and offered $25,000 for it, but the American Writing Paper Company of Holyoke, Mass, outbid him and secured it. It is a curious coincidence that the same Company also owns what is claimed to be the world's largest writing paper making machine. Altogether, the number of exhibits amounted to several hundred, including samples of the finest work done by printing firms in all the large centres of the continent.

In a recent article on the Provincial Paper Mills, Ltd., in these columns, the strong position of this Company was pointed out. This is confirmed by the last statement issued by the Company which shows that the Company's position is exceptionally satisfactory in every respect. As is well known, it has the advantage of an extremely efficient administration.

The first of the two actions which Hon. W. E. Raney, Attorney General of Ontario, is bringing against the Shevlin-Clarke Company of Fort Frances, Ont., asks for a declaration that the Company had sold 355,764,303 feet board measure of lumber on which it had paid no Crown dues or bonuses. An amended statement of claim, filed 23rd March last, suggests the basis of settlement at $15 for every tree other than pine, and $25 for each pine tree, cut, or caused to be cut, and carried away, together with the full value of timber and logs so carried away. Wastefulness in cutting operations is alleged, as is the making of "false and fraudulent returns," for the purpose of "enabling the defendants to defraud the Crown out of large sums of money," and "to enable the late Thomas H. Shevlin and the defendants to convert to their own use large quantities of valuable timber." The revocation of certain cutting licenses is also asked for, and in a statement of claim, dated the end of last month, the Crown claims $250,000 damages for timber wrongfully cut on certain berths by the defendants. The defendants, in a statement of defence on the 12th instant, assert that the two Quetico forest reserve berths involved were not sought by them, but had been accepted at the solicitation of the Department of Lands and Forests, with a view to conducting slash-burning experiments on behalf of the Government. They point out certain sums of money, their property, retained by the Government, and state: The allegations and insinuations contained in the statement of claims as to any suggested improprieties in the making of the said contract are false and without foundation."

United Typothetae Of America Convene In Canada.

With the Convention of the United Typothetae of America in session most of last week in Toronto, a great deal has been heard of the strike situation. On exhibition were charts from the Industrial Relations section of the Typothetae showing the progress during the strike. According to these charts, Quebec, Montreal, Ottawa and Toronto are operating at least eighty-five per cent. on the basis of the forty-eight hour week. New York is 66 2/3 per cent. on the forty-four hour week basis, and Chicago is fifty per cent. on that basis, which is also general on the Pacific coast, while in the other centres of the United States the Typographical Union is indicated to be waging a losing fight. One chart showed that 22 per cent of the printing shops of Canada and the United States are only one-man shops; 49 per cent. employ from one to five men; 19 per cent. from six to twenty men; and .0 per cent. more than 1,000 persons. In connection with the question of industrial relations, Mr. F. H. Silcox, in charge of this department, told the Convention that good headway was being made in the fight against the closed shop, and aserted that the cost of living was dropping faster than wages were. His firm, but temperate, references to the successful growth of the open shop principle

evoked on outburst of hearty applause which was not without significance.

Many of the discussions of the Convention were of great interest, particularly that on "Education and Better Craftsmanship," on which subject a very trenchant and pungent paper was read by Mr. Harry L. Gage, of New York, who very vigorously criticized the officers of the organization for not taking more interest in attempting to obtain better craftsmanship in the industry.

Before its proceedings came to an end last week the United Typothetae of America published an advertisement signed by its president and other executive officers "branding as absolutely false the statement that the United Typothetae of America is a party to any agreement made between the representatives of any printing trades unions and any employing printer acting in their individual capacity or as members of a division." It further announced that the public's interest is paramount in the policy of the organization, and that it has resisted attempts to increase the cost of printing by a reduction in the present working week of forty-eight hours with its Saturday half-holiday.

At the Convention of the United Typothetae of America the following officers of the organization were elected for the ensuing year: President, Mr. J. Linton Engle; 1st Vice-President, Mr. J. Clark Acton, of Toronto; Vice-Presidents, Messrs. C. K. Horn, E. F. Scribner, and R. B. Nelson; Committeeman from the 16th district, which covers a large part of Eastern Canada, Mr. W. W. Southam, of Toronto.

Mr. John McParland, President of the International Typographical Union, stated in Toronto, last week, that that body would have to consider the advisability of establishing printing plants in large centres to parallel employing printers who were opposing the Union. He added that it would be able to underbid them and to carry their losses through the vast sums at its disposal. He further declared that the attitude of the Union and the forty-four hour week question remained unchanged and that there could be no compromise over this demand.

A big over-Sunday job was recently done at Iroquois Falls, when the Abitibi Mill changed over a chain scraper coal conveyor to a belt type. All the necessary material was on the job and all possible preliminary work done, so there was no interruption to the boiler plant.

A basket ball league was formed at the Abitibi mill, with the following teams—Townsite, Electricians, Paper Mill, Office, Machine Shop. Where are the pulp makers?

Evening classes have started at Iroquois Falls. The most popular class is English in which there are close to a score of non-English learning to read and write the language; there are Italians, French, Russians, Poles and Austrians. They are determined to gain a mastery of the English tongue, and they will. French is also a popular class, most of those taking it being in the offices or having a connection with clerical work. Mechanical drawing, sewing and electricity are also well filled and in all three there will be two classes, a junior and a more advanced.

Steam engineering was slow to start, but applications are now coming in from men who wish to qualify for certificates and this class will start shortly.

The classes are held Tuesdays and Thursdays at 7.30 to 9.30.

MOISTURE STANDARD FOR CHINA CLAY.

For many years the question of a standard of moisture in china clay has been discussed between the producer and consumer.

To arrive at a fair and agreeable standard is not so simple as at first thought it might appear. China clay cannot be dried below a certain percentage of moisture without calcining, and by so doing it becomes useless. Again, if dried below a percentage of moisture which is entirely free from from calcining, the clay loses some of its virtue. This is particularly true in relation to clay in papermaking.

Shipping clay in bulk has of recent years become almost universal, and this again necessitates a fair percentage of moisture being retained to enable transport to be effective without loss through clay powder being blown away. Clay is an absorbent material, and readily acquires moisture from the atmosphere. All these considerations have been well before the producer, who has, we think, on the whole shipped clay to the consumer on a fair and equitable moisture basis. At the same time, some consumers insist that a standard of moisture should be arrived at, and a clause to that effect be inserted in the contract forms.

It may be that producers themselves would be glad to have a standard fixed which should free all parties from an unknown responsibility. But if such may be arrived at, would it be only fair to buyer and producer to pay and receive respectively upon any moisture above or below the standard? For example, should 12 per cent. be agreed as a standard of moisture, then anything over and above 12 per cent. moisture should be refunded to the buyer, anything under 12 per cent. moisture should be paid for extra by the buyer.

To satisfy producer and buyer, this moisture standard should probably be controlled at point of shipment or original truck loading, and a competent analyst appointed whose report would be final.

It will be interesting to have opinions expressed.—"China Clay Trade Review."

Announcement is made by L. B. Holliday & Co., manufacturers of dyes, chemicals, etc., that Mr. Rushforth has severed his connection with this firm and that Mr. H. H. Hartley, 248 Clarens Ave., Toronto has been appointed as representative in his place.

There is encouraging evidence of activity in connection with the Metabetchuan (Que.) Pulp & Paper Co. The engineering contract for the acid plant has been awarded to G. D Jenssen Co., New York.

Mr. Maurice Neilson of the Belgian Industrial Co., has joineed the "newly-weds"; *they* have been honeymooning at Atlantic City.

Mr. E. Barney of the Tagliabue Mfg. Co. of Brooklyn, N.Y., is visiting paper mills in Canada, explaining a device for controlling the temperature rather than the pressure in the dryers of a paper machine.

A French patent, No. 524,103, to Emile Scherret, provides for the application of pressure to the wood in a grinder pocket by means of multiple stage centrifugal pump, direct connected to the pressure piston. The working side of this piston is open to water from the maximum pressure stage, while the return is operated by water from a lower stage.

Complicity with error will take from the best of men the power to enter any successful protest against it.

He who would seek to command must learn to obey.

(Continued from page 1101.)

Chimique, VII, 398, (Nov. 1920). Same as Br. patent No. 139,232, September 18, 1919; U. S. Patent No. 1,347,801, July 27, 1920.—A. P.-C.

L-6. Composition for Moulded Toys. Can patent No. 209,039, ROBERT ASHMORE POGUE, Toronto, Ont., Canada, March 1, 1921. The composition consists of 1 part by vol. of flour, 6 parts by vol. of sawdust and a binder composed of a solution of 1 lb. of glue in 1 gal. of water, to which may be added a small amount of plaster of Paris if desired. The mixture is made into a homogeneous pastelike mass and baked until any stickiness has disappeared. Claims allowed 7.—A. P.-C.

L-7. Tray for Spindles for Spinning Paper. Br. patent No. 509,854, FERNAND JEAN PIERRE STOFFEL, (Seine), France, Aug. 26, 1920. **Papier,** 68-9 (Feb. 1921).—A. P.-C.

L-7. Paper Twine. Can. patent No. 209,871, PERCY REGINALD HOAD, Toronto, Ont., Canada, March 29, 1921. A process for the manufacture of twine from paper consisting in subjecting a strip of paper to a moistening and waterproofing treatment, then crimping the treated strip so as to form a narrow strip composed of a multiplicity of layers, then twisting this narrow strip until its size becomes sufficiently reduced for it to pass through a die producing a desired size twine.—A. P.-C.

L-7. Yarn and Twine from Paper. Can. patent No. 209,994, JAMES SPICER and SON, Ltd., London, E.C. 4, assignee of JOHN SWANZY HARLEY, Waltham Abbey, Essex, both in England, March 29, 1921. Claims allowed 7.—A. P.-C.

L-7. Waterproof Threads. Can. patent No. 209,353, LA SOIE ARTIFICIELLE DE LA VOULTE, assignee of LOUIS GABRIEL RAYMOND AUZENAT, both of Paris, France, March 8, 1921. Threads and fabrics, the tensile strength of which diminishes in the moistened state, are waterproofed by treating the threads and fabrics (a) with vapors of oil of turpentine and acetic acid and subsequently admitting ozonized air or (b) with vapors of phenol and subsequently with vapors of formaldehyde, or (c) with vapors of phenol and subsequently with vapors of formic acid and formaldehyde. Claims allowed 5.—A. P.-C.

L-0. Mats from Wood Fibers. Can. patent No. 209,952, THE C. F. BURGESS LABORATORIES, assignee of HOWARD F. WEISS, both of Madison, Wis., U.S.A., March 29, 1921. The patent covers, as a new article of manufacture, a fabric of wood fibers cemented together by an adhesive solution containing starch and having a resilience such that its volume under normal conditions is less than 0.40 Gm. per cu. in. and under a pressure of 1 lb. per sq. in. its volume is reduced to 1.60 Gm. or more per cu. in. Claims allowed 14.—A. P.-C.

M-4. Alarm for Rope Drives. Can. patent No. 188,201, ALFRED PATRICK DEVINE and JOHN LATREILLE, Fort William, Ont., Canada. Claims allowed 3.—A. P.-C.

M-0. Standardizing Papermaking Machinery. World's Paper Trade Review, lxxv, 23, June 10, 1921. An article on developments in modern paper mill engineering. The opinion is expressed that if only paper makers and users of paper could combine a little more, much could be done towards standardization of papermaking machinery.—A. C.

N-4. Turbine Furnace. Paper Making, xl, 6, p. 172, June, 1921. An article describing the turbine furnace, manufactured by the Turbine Furnace Company, Ltd., 5 Bridge Row, London, E. C. 4, whereby a constant and uniform flow of air is circulated throughout the whole grate area, remedying slow steam raising, waste of fuel and laborious stoking.—A. C.

Q-0. Industrial Housing. Pulp and Paper, xix, 239-42 (March 3, 1921). Hints on the designing and construction of houses for pulp and paper mill workers, when it is advisable or necessary for the company to erect them.—A. P.-C.

R-1. Woodpulp Manufacture in Sweden. L. PIERRON. **Rev. Chim. Ind.,** xxix (Oct. 1920); **Papier,** xxiv (Feb. 1921). Brief review of the production of sulfite, sulfate, and mechanical woodpulp in Sweden, and of the utilization of sulfite waste liquors for the production of binders, adhesives, tanning extracts, ethyl alcohol, fuel, cattle feed, fertilizers, dyes, and mordants.—A. P.-C.

R-11. Fitting the Foreman for his Work. Pulp and Paper, xix, 267-9 (March 10, 1921). An analysis of the the importance of training the foreman in the executive duties of his position and of the courses given by the Business Training Corporation of New York to this end; together with a few examples of what such training has actually accomplished in the case of foremen in the paper industry.—A.P.-C.

R-11. Research Department for Paper Industry. Pulp and Paper, xix, 127-30 (Feb. 3, 1921); 159-62 (Feb. 10, 1921). Text of the report of the Joint Committee (Col. C. H. L. Jones, Spanish River Pulp and Paper Mills, chairman) appointed by the Canadian Pulp and Paper Asociation and the Technical Section of the C. P. & P. A. to investigate possibilities respecting the institution of a department of technical research within the activities of the C. P. & P. A., of the ensuing discussion and of the address of Dr. R. F. Ruttan on the cooperation of the Research Institute with the pulp and paper industry. Both the Technical Section and the C. P. & P. A. approved of an immediate start being made with the industrial research department, without attempting to build a central research laboratory at once, the main work to begin consisting in the coordination of the research being carried on in the various mills.—A.P.-C.

R-13. Transactions of the Technical Section of the C. P. & P. A. Pulp and Paper, xix, 73-82 (Jan. 20, 1921); 127-30 (Feb. 3, 1921); 159-62 (Feb. 10, 1921); 189-91 (Feb. 17, 1921); 217-9 (Feb. 24, 1921); 245-6 (March 3, 1921); 271-4 (March 10, 1921); 299-300 (March 17, 1921); 323-4 (March 24, 1921); 347-9 (March 31, 1921); 375-7 (April 7, 1921). Texts of the reports of the committees on mechanical standards, chemical standards, education, testing moisture in pulp, abstracts and publications, technical research; together with discussion of reports, of the revision of membership qualifications so as to admit superintendents and practical men as full members, and of the following papers presented at the convention: "Insurance of Pulpwood" (**Pulp and Paper,** xix, 323-4, March 24, 1921); "Protection of Log Piles by Artificial Fog" (**Pulp and Paper,** xix, 5-7, Jan. 6, 1921; 37-9, Jan. 13, 1921); "Speed Inter-Lock as Applied to Paper Machine Drives" (**Pulp and Paper,** xix, 59-64, Jan 20, 1921); "The Ventilation of Paper Machine Rooms" (**Pulp and Paper,** xix, 183-8, Feb. 17, 1921); "Strength Testing of Sulphate Pulp" (**Pulp and Paper,** xix, 68-72, Jan. 2, 1921; and also paper presented by I. L. Gartland on "The Microscope and its Relation to the Pulp and Paper Mill" (Pulp and Paper, xix, 347-9, (March 31, 1921; 375-7, April 7, 1921).—A. P.-C.

UNITED STATES NOTES

Interests headed by Hugo Stinnes, Germany's colossus of industry and the greatest newspaper owner in that country, have invaded the American newsprint market with two and a half cent a pound paper. This paper is being offered in New York by a representative of the German paper interests. Paper of standard specifications will be delivered Atlantic or Gulf ports c. i. f. on thirty day terms. Large enough quantities will be shipped to America to insure a supply adequate for a month's demand for the New York newspaper publishers.

The California State Board of Forestry has obtained an option to purchase 394 acres of timber in Humboldt County in accordance with a conservation act passed by the last California legislature. Selon H. Williams of the forestry board in announcing the deal, said the purchasing price is put at $65,000.

Whether Alaska with its large tracts of timber lands so far practically untouched can be made a source of papermaking to help take place of the rapidly dwindling resources in the states, is arousing considerable discussion. The United States forestry service is urging establishment of mills in the northern territory and several are already projected in the Tongass forest district. Much doubt is expressed by paper manufacturers that paper from Alaskan wood can be used profitably for paper sold in eastern United States, in view of the long freight haul. It would necessitate coming into competition with paper manufactured from wood cut in the Eastern Canadian provinces and Scandinavian paper. These conclusions regarding the feasibility of utilizing Alaskan pulpwood in paper making are summed up in a survey recently completed by the American Pulp and Paper Association.

Hunting forest fires from airplanes, which has proved one of the most effective methods of reducing fire loss of timber, is about to be discontinued after several seasons of use because the army air service will no longer lend its planes and pilots for this purpose. The aerial forest patrol is still in existence, but an order has gone forth for its discontinuance this year.

The problem of preserving for posterity important newspaper files, which, since wood pulp superceded rags, in the manufacture of newsprint, has baffled librarians all over the world, at last apparently has been solved by officials of the New York Public Library. After seven years of experimentation, backed by the cooperation of three New York daily papers, each of which has spent $5,000 to find the best preservative method, the officials believe they have discovered the correct solution, that of mounting each newspaper sheet between two sheets of Japanese tissue. The files of the New York Evening Post are now being preserved by the new method. This shuts the original sheet from the air, reduces its legibility but slightly, strengthens the page and permits its free handling without danger of disintegration.

Geographically speaking, New Orleans and Brooklyn, New York, are very far apart, but the genius and the capital of a group of Brooklyn citizens are destined to bring them close together in an enterprise that promises to revolutionize the production and manufacture of paper. Okra, a vegetable plant grown extensively in Louisiana, is the product their chemists and engineers are utilizing to take the place of wood pulp. The National Pulp, Paper and Cordage Company, is to be the firm name of the corporation formed by the Brooklyn men, and it has already established just across the river from New Orleans, an up to date plant which it owns outright. This plant is said to be capable of turning out 25 tons of paper daily. The property adjoins that of the Texas Oil Company, which supplies fuel oil directly through a pipe line into the paper mill boiler room. In addition the company owns 1,200 acres of land within motor transportation distance of the mill for the cultivation of okra, and has leased a 350-acre okra plantation in the vicinity of the mill. Experiments of the chemists have resulted in the discovery that the outside fiber of the plant has an excellent substitute for cordage, burlap, matting and such things. The wooly portion of the stalk produces a high grade pulp, superior to the wood pulp. This, according to the company is shown in a letter from the physiologist of the Bureau of Plant Industry in which it is stated that the samples of paper sent him by the company proved to be of fair folding and tensile strength, if anything, even slightly superior to the usual book paper with which it was compared. Its elastic qualities were also favorably mentioned. Foremost among the men pushing the new concern is Patrick Trainor, president of the P. Trainor Company, boilermakers. Mr. Trainor is the company's president. Others interested are: Frank A. Hawxhurst, of the Brooklyn Blue Print Works, who is treasurer; Chester W. Dibble, of the McCraw-Hill Company, publishers; George Donohue, Fred E. Hilliard and Louis W. Juhring, all well known New York business men. S. S. Bagot, who now makes his home in New Orleans, is secretary, and Louis W. Fehning, a New Orleans man, is general manager.

While surrounding States have been hard hit by damaging forest fires this year, Wisconsin has been singularly fortunate in the respect that it has been visited by very few. The patrols and rangers have been extremely vigilant and the state conservation commission has been keeping close tabs on fires and has brought its warnings urging caution to the attention of hunters and campers in specific instructions and notices.

T. Yamachita, chief engineer in the Japanese government paper mills, is in the United States on a tour of inspection, observing mills methods with a view to taking back with him ideas for effecting improvements in Japan's paper making establishments. Mr. Yamachita has visited mills in the Middle West, and he intends looking over the principal plants in the United States and Canada before he concludes his tour. Discussing conditions in Japan, Mr. Yamachita said that business has been gradually going down, that some of the mills are suspending operations and that many more are going into bankruptcy.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 22nd Oct.—Slowly but surely the whole of the industry continues to improve. The general policy, for the present, has, for one of its principal aims, if not, indeed, the principal aim of the moment, the stabilization alike of production and of prices. And, in both directions this policy is meeting with a gratifying measure of success. Mills are becoming progressively busier. Indeed, quite a few, including some newsprint mills, and one large kraft concern are working to full capacity. Others which last month were working at seventy per cent. are this month, working to eighty per cent. of capacity. And so it goes nearly all along the line. Orders are coming along with a markedly increased and increasing briskness. Representatives of three large mills, selected almost at random, told the writer, this week, that orders of sufficient volume to keep the plants of their respective concerns busy till the end of the year wer in, and that, when these were filled, the orders that are in sight would be heavy enough to ensure satisfactory business for a considerable further period. The truth is that confidence is being—indeed, to a large extent, it has already been—re-established. There is a good deal less scepticism today, than was in evidence even so recently as a month ago, as to the reliability of the assertion that prices are now finally at rock-bottom. Any price revision that occurs now will probably be in an upward direction. Indeed, from information received by the writer today, it would not be wholly a matter of surprise if, in two lines, a revision of prices upwards were to take place almost immediately. But, with these possible exceptions, prices are likely to remain at their present level until the New Year. With such a much more stable tone to conditions than obtained, say, three or four months ago, it is not surprising that orders are coming along with greater freedom and of larger size. For it is an incontrovertible fact that consumers, in nearly all lines, had allowed their stocks to become quite extraordinarily depleted. Like Mr. Micawber, they were "waiting for something to turn up." And now that it looks pretty sure that whatever that "something to turn up" will be, it will not be lower prices, they are showing an unmistakable disposition to govern themselves accordingly and replenish their stocks. The change that, in a little over two months, has gradually come over the psychology of those engaged in the industry is very striking. Almost unanimously, the view is held that next year will be a year of solid if modest, prosperity, with nothing about it likely to be meteoric, in the way of a boom, but one of stable, if not dazzling, business.

PULPWOOD.—There is no reason to alter or modify the opinion, more than once expressed in these columns, that the pulpwood cut this season will be unusually small. Nearly all the paper companies have large stocks on hand, and the same remark applies to lumbermen. An exception to the general rule of the paper companies going in for a smaller cut is probably to be found in the Abitibi Pulp and Paper Company, which concern owing to the large increases in production which it has assured, will probably go in for woodcutting operations on a considerable scale. Help in the woods is not only immensely cheaper than last year but also abundant and far more efficient.

PULP.—The pulp market is still listless. But there have been some indications of an increase in the demand for kraft pulp, while the reopening of the Riordon Company's Kipawa plant is taken to indicate an improved demand for sulphite.

NEWSPRINT.—The lower prices for the current quarter in newsprint are having a stimulating effect on conditions. As regards the export of this commodity to the United States, it is stated that the contracts now being negotiated for next year's supply show no decrease in the demand for Canadian paper.

BOOK PAPER.—Mills are doing a satisfactory business and the demand for book paper continues to improve.

BONDS AND WRITING PAPERS.—Business in bonds, ledgers and writing papers is picking up slowly but surely. Orders are coming in better and the mills are gradually increasing their output.

WRAPPING PAPERS.—There is a satisfactory increase in activity in practically all lines of wrapping papers. Particularly is this noticeable in respect to kraft, the situation in regard to which has been becoming increasingly favorable for several weeks, as has been mentioned in these columns from information obtained directly from representatives of the largest mills manufacturing this grade of paper. About a couple of months ago, the tide showed signs of definitely taking a favorable turn, according to information received then from the representative of one such mill, and, ever since, week by week, an improvement has been manifested until today the outlook can be pronounced to be not merely good, but very good.

WASTE PAPERS.—Nearly all grades of waste paper show an improvement in demand, with the market exhibiting a satisfactory firmness. This is, in fact, one of the gratifying features in the generallly improved situation. not only in itself, but also for what it augurs.

RAGS.—Roofing rags are a good deal firmer and increases in both volume and size of orders are reported. There is a considerably improved undertone to the market in domestic rags.

TOILETS AND TISSUES.—Manufacturers of toilets and tissues are undeniably optimistic. One manufacturer told the writer that his mills are running to capacity, and he expressed the view that other mills were experiencing the same condition.

NEW YORK MARKETS.

New York, October 22—(Special Correspondence).—In one sense, the threat of a country-wide railroad strike has served to enliven the demand for paper to an extent; in another way, it has made for a quieter market. Consumers and jobbers in quite a few instances have exerted efforts this week to augument their stocks of paper, and have consequently placed hurry orders with mills for deliveries as rapidly as possible which they probably would otherwise have held

off in placing were it not for the strike outlook. This naturally has led to increased business in paper and board in some quarters, whereas in other cases buyers have purposely held back in operating in the market, presumably feeling that should the strike become effective and last for any length of time that the only result on the paper market would be to send prices down.

Sentiment generally in the trade in New York is that the strike will not materialize. Paper merchants here are of the opinion that some way will be found out of the difficulty because they feel that the Government is flatly opposed to the proposed strike, and also that the present is a most inopportune time for such labor movement in view of the vast number of unemployed and the general dullness affecting industry. In consequence of this opinion, the effect on the paper market thus far has been more of a quieting character than in stimulating demand. However, business of comparatively broad scope is current. Consumers in common are absorbing fair amounts of paper from mills, and are slowly though consistently increasing the volume of their orders, this being done because they are in greater need of paper. On the whole, the industry is still abnormal, but trade authorities are almost a unit in saying that business is steadily improving, that the situation is distinctly healthy and that matters are such as to offer much encouragement.

The movement of newsprint from producing plants into consuming channels continues to broaden, and reports state that print paper mills are running at close to capacity and are shipping out even larger tonnage than they are now manufacturing, which means mill stocks are being gradually reduced. Newspapers are still increasing the size of their issues, owing, of course, to more advertising, and with the election drawing near and the pre-holiday shopping season not far off, everything is in favor of a continued increase in consumption of newsprint during the next several months. Prices are steady; in fact, steadier than they have been in a long time, and there are some connected with the trade who are so bullishly inclined that they are talking of higher prices for newsprint by the end of the year. Spot lots of standard news in rolls are selling at around 4.25 cents per pound at the mill, and now and then one hears of a sale at better than this figure, although on the other hand, some producers are marketing newsprint among transient buyers at about the same basis as is quoted to contract customers, namely 4 cents a pound f.o.b. mills.

Business in fine papers shows consistent growth, and mills making bonds, linens and ledgers are busier than in many months. According to reports, there is scarcely a writing paper mill in the States which is not operating, and while some of them are on part time, a majority are securing sufficient business to warrant almost full production. Quotations on fine papers are stiffening, and while no sharp advances have occurred, buyers nevertheless find it necessary to pay quoted prices to procure supplies.

Another pleasing development has been the increase in demand for building papers. This is not surprising in view of the large amount of building construction going on all over the country, which for a while was not reflected in the paper market owing to the large stocks of felt and roofing paper in stock but which is now making itself felt to no small extent. Building paper mills are running at larger capacity than probably at anytime this year and are finding a ready outlet for their product.

Book papers hold firm in price and are moving in substantial tonnage. Tissues are in good demand and quotably steady, and wrappings are enjoying a lively demand, this being the season when wrapping papers are in relatively larger demand than at any other time of the year. Moreover, the advancing trend in raw material is causing manufacturers of wrapping papers to quote firmer prices. Both kraft pulp and old kraft paper stock is strengthening in price, which makes it necessary for producers to obtain better prices on finished kraft papers.

The board market is moderately active. Prices are on the upgrade and consumers are absorbing supplies in regular fashion. Plain box boards are selling at between $38 and $40 per ton f.o.b. New York on chip board and around $42.50 a ton on news board. Other grades, such as folding box boards and corrugated boards, are stiffening in price under a heavier movement toward consumers.

GROUND WOOD.—Although quotations on mechanical wood pulp show a strong tendency, no actual changes of note have developed in prices this week. Grinders are firm in their ideas regarding prices and are insisting on figures at close to the top of quotational ranges when making sales, yet the bulk of current transactions are at around a basis of $30 per ton f.o.b. producing plants for domestic spruce ground wood. In some cases higher prices are being obtained, but in these instances the consuming mills are invariably situated near to producing plants, so that such buyers are paying no more than consumers who are far from grinding points and who are procuring pulp at a lower f.o.b. producing mill basis. Reports from grinding sections continue to tell of unfavorable water conditions; in fact, it is stated that in many cases mill streams are lower than at any time thus far this year, which is materially hampering manufacturing operations and thus reducing available supplies. This is seemingly the strongest factor in the market although increasing demand is also having its influence.

CHEMICAL PULP.—On the whole, reports tell of a fairly good movement of chemical wood pulps into consuming channels, yet members of the trade generally acknowledge demand lacks the volume of more normal times. Paper manufacturers are buying freely when in want of pulp, and it can be said that the average paper mill is requiring larger amounts of raw material every day, yet there is a decided indisposition evinced toward buying against future needs. Bleached sulphite is in steady call. One of the largest domestic producers is said to be operating at present at 92 per cent of capacity and to be shiping out pulp at the rate of 132 per cent of normal capacity, meaning that it is removing considerable stored sulphite. Another prominent manufacturer of bleached sulphite is reported sold up for several months ahead. The price prevailing on strictly No. 1 domestic bleached sulphite is 4.25 cents f.o.b. pulp mill, with secondary grades ranging down to 4 cents per pound Kraft is steady at between 2.75 and cents a pound at pulp mills on domestic kraft, and from 2.50 to 2.75 cents ex dock on foreign kraft. Foreign No. 1 unbleached sulphite has sold rather freely this week at around 2.75 cents a pound ex the dock, while domestic news grade sulphite is moving in a regular way at 2.50 cents.



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INQUIRIES SOLICITED:

RAGS.—The rag market rules firm and further advancement has been recorded in prices on several grades. Probably the strongest item at the moment is roofing stock. Sales of No. 1 roofing rags have been made by New York dealers to mills at 1.20 cents a pound f.o.b. this city, and of No. 2 packing at 1.10 cents, while reports from the Middle West tell of sales there as high as 1.50 cents at dealers' points for No. 1 roofing Felt mills are buying actively and are gradually raising their prices. Old white rags also are exceptionally firm, with reports stating that No. 1 repacked whites are bringing 6 to 6.50 cents, and street soiled whites around 1.65 cents. New white shirt cuttings are quoted at stiff prices, dealers in frequent cases asking 11 cents a pound, though mills are reported filling most of their requirements at 10 to 10.50 cents.

PAPER STOCK.—Consuming demand for old paper has eased off to some extent this week, this being attributed by authorities to the impending railway strike because most mills that have let up in their buying are in the West and a far distance away from New York, yet prices hold firm and there is as yet no sign of any weakness in values. Packers are very strong in their insistence on full quoted figures, using the scarcity of most grades of waste paper to support their contention that they must get the prices asked in order to operate profitaby. Shavings are quoted at between 3.50 and 3.75 cents a pound f.o.b. dealers' points on No. 1 soft white, and from 4 cents upward on No. 1 hard white shavings. Old books and magazines are held for around 1.65 cents, and ledger stock is quoted at 1.75 to 2 cents a pound. Prices named by dealers in this city on other grades range around the following figures: Mixed ooks and magazines, 1.25 cents; No. 1 manilas, 1.10 cents; No. 1 old kraft, 2.25 cents; overissue newspapers, 90 cents a hundred; folded newspapers, 70 cents; No. 1 mixed paper, 55 cents; white blank news cuttings, 2 cents.

OLD ROPE AND STRINGS.—Dealers as a rule are refusing to accept orders for sizeable lots of old manila rope at less than 4.75 cents a pound at shipping points, and claim to be obtaining this price without difficulty. Old bagging is in better demand and is selling at an average of 90 cents per hundred pounds for No. 1 scrap bagging, and slightly over one cent a pound for gunny bagging.

If you are content to drift lazily, you'll by and by find yourself at sea.

JENSSEN ENGINEERING PRODUCTS ORGANIZED.

This Company has been organized to handle various kinds of paper and pulp mill machinery and specialities, and has absorbed the business of the Power Equipment and Supply Co. which is now incorporated with the Jenssen Engineering Products Limited. This firm is planning to handle all kinds of paper mill equipment, and to render at the same time engineering services. They are cooperating with well known engineering experts and shall therefor at all times be in a position to render the best possible engineering services. They are also prepared to act as purchasing agents for mill supplies for firms that might wish such a service.

The personnel of the Company are all well known to the trade; Mr. L. N. Jenssen, who has been for years in the construction business, is a well known engineer, and his associates and he have had extensive experience in the various departments of construction and mechanical equipment. Mr. J. C. Corcoran, who was for years connected with the Rice, Barton & Fales Co., and was later connected with the Dominion Engineering Works, is a well known engineer and salesman connected with the paper trade, and many of the improved methods now employed in the trade has been brought to the attention of our pulp and paper makers through his endeavors. Mr. F. W. Ward and Mr. J. A. Smith, who are the proprietors of the Power Equipment Co., are well known to all the engineering and contracting firms of Canada, and have had large experience in the building and equipping of various mechanical plants which are now in successful operation.

The personnel of this company should assure it of success as their engineering abilities and experience will enable them to render their customers the very best of service in assisting them to solve their problems, and finding the most suitable equipment and working methods in each case.

The Directors of this concern consist of Mr. L. N. Jenssen, Mr. F. W. Ward, Mr. J. A. Smith, and Mr. J. C. Corcoran, and the Board of Directors have elected as officers of this concern, Mr. L. N. Jenssen, President and Treasurer, Mr. J. C. Corcoran, Vice-President.

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OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., November, 3, 1921. No. 44

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-2 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

NOVEMBER ELEVENTH.

Remember the sacrifices that made Peace possible.

Pray for the conference that can make Peace permanent.

THE GENERAL ELECTION.

By the Associate Editor.

The general election campaign, in the throes of which the country finds itself at the present moment is one of exceptional interest and importance. For the first time in the history of Canada, since Confederation, three separate parties, each with an accredited leader, electioneering machinery, and a formulated program, of its own, will be contestants for place and power on the day of polling. They are: the present Government, the Liberals, and the Progressives.

This unique feature of the forthcoming contest, in itself, renders the latter of unprecedented interest. It makes the campaign, in various ways, more complicated and more complex, and more pregnant with possibilities of alignments and alliances of far-reaching import, than any election of which we have hitherto had experience in this country.

One of the dominant issues in the campaign is the fiscal issue. Indeed, according to the Government press, this is the only issue. But, naturally, neither the Liberals nor the Progressives agree to this view. For, in the very nature of things, the record of the Government which is appealing to the constituencies to sustain it in office, must also perforce, be one of the leading issues. However, the fiscal issue is, as we have said, undoubtedly one of the dominant issues to be decided at the polls.

As it happens, the fiscal question is one with regard to which the attitude of any party is peculiarly liable to misrepresentation by that party's opponents, — and such misrepresentation need not, necessarily, be wilful and deliberate. For, in Canada, today, that issue is not, and cannot be, defined with absolute and uncompromising sharpness, as it could be were the issue that between unequivocal Protection, on the one hand, and unequivocal Free Trade, on the other. In the present contest, none of the three contending parties stands for out-and-out Free Trade at the present moment.

Nor is this, in any way, surprising. It must be borne in mind that, for many years now, the accepted national policy—we are not, of course, here using that expression in the party sense in which it is often used—in fiscal matters has been a tariff policy. It is true that the Conservatives frankly avow their faith in a tariff as an instrument of Protection, as a weapon to be used for purposes of defence, if not of defiance. It is, further, true that the Liberals, by tradition, acquiesce in a tariff for purposes of revenue. But is is also true that, in the past, the tariff, as it has hitherto operated in Canada, has not, whether framed by Liberal or by Conservative bonds, shown, on its face, any radical indication as to whether the hands that framed it were actuated by frankly protective, or merely "tariff-for-revenue" motives.

But while all this is true as regards the tariff, as we have had experience of it in actual operation in Canada, it does not fairly indicate the difference between the fiscal policy of the two historic parties today. Now, as of yore, the Conservatives desire to maintain an avowedly protective tariff—and they point to that in operation under the last Laurier administration as a tariff of that nature. But the Liberal fiscal policy went a good deal further than the tariff in operation when the last Laurier Government, by reason of circumstances beyond its own control, went out of office. Speaking in Halifax, last Friday, the Hon. W. S. Fielding, ex-Minister of Finance, made it plain what was the Liberal fiscal policy when that party left office. "Turn back," he said, "to 1911 and the policy of the Liberal party. In the tariff as it stood at that day, with the amendments that were contemplated when the Liberals went out of power, you will find the elements of a sane tariff policy — not the finished edifice, but the groundwork and the framework of a sound tariff policy."

Thus the Liberal tariff policy was not, in 1911, represented by the tariff as it stood in that year, but by that tariff, plus certain fiscal proposals that were then being put forward for its amendment. That policy the Liberals, being swept from office, were prevented from making effective. But the amendments proposed were of a far-reaching kind. We are not going to attempt to discuss them here, further than to say that their addition to the tariff as it stood in 1911 would have rendered the Liberal fiscal policy far more conformable with the Liberal fiscal theory of a tariff for revenue purposes only than any fiscal policy which has been carried into effect in Canada since first we had a tariff of any kind.

Thus we have shown—or tried to show—the main distinction between Conservatism and Liberalism on the fiscal question. If it be said that both parties are agreed on the necessity for tariff revision, the ground is not really shifted—the distinction still remains. For the revision which the Liberals desire is a general one downwards. That is not the sort of revision which the Conservatives contemplate.

What, then, of the third party—the Progressives? Their ultimate ideal is Free Trade. But they are pledged

against any sudden subversion of the fiscal system of the country such as would be involved in the immediate adoption of that policy. None the less, were they to obtain a clear majority in the next Parliament tariff revision, at their hands, would probably be more sharply in a downward direction than it would be at the hands of the Liberals.

As things look at present, no one party of the three is likely to get a clear working majority in the next House of Commons. "The King's Government must be carried on"—that is a maxim of our constitution modeled, as it is, on the British constitution. Working arrangements between parties—whether by way of coalition, or of more or less formal alliance—will probably have to be made. The question is: Between which parties; or (possibly) Between which party and which section of which party?

The whole subject is a piquant and "intriguing" one. It is one to the consideration of which we intend to return at an early date.

MR. KEENAN RETURNS TO THE FOLD.

Whether the editorial fold is to be of white or of black sheep, Thos. J. Keenan is back in it, and again occupies the Editorial chair of *Paper*. He was editor of this well known and important journal for many years, and, for six years also carried on as secretary of the Technical Association of the Pulp and Paper Industry, which he was instrumental in organizing. During the past year Mr. Keenan has devoted his time exclusively to the work of the Association and will doubtless find the experience and the intimate contact thus obtained with the men of the industry of great benefit to him and, indirectly, to the many readers of his paper. We are glad he is back, and wish him all success. Paper and the Pulp and Paper Magazine have their own peculiar (perhaps in both senses) ways of serving the whole industry and have always tried to be mutually helpful.

IT CAN'T BE DID.

Our esteemed contemporary, the Shawinigan Falls Review, in a recent issue, said, referring to the text-books, "Volumes 4 and 5... will be out before the end of this year."

It is good to be optimistic, but this statement borders, in fact intrudes, on the imaginative. In the first place, it has been impossible for some of the authors to complete their manuscripts, and some sections can't be finished till others, which are preliminary, are in hand. Then there are such incidental, but time consuming operations as editorial work, preparation of illustrations, setting of type, proof reading (both in galley and page forms), making of cuts, printing, and binding. These things can not be done by the waving of a wand—not nowadays.

The work is proceeding as rapidly as a conscientious and industrious staff can do it properly, but volumes 4 and 5 will not be out this year. It can't be done. We *hope* to have volume 3 out, though.

COBWEBS.

By the time navigation in the St. Lawrence closes, more grain will have been exported from Montreal than from all other Atlantic ports combined. Montreal's shipping is greater than for any other American port except New York.

"If a man kan't laff there iz sum mistake made in putting him together, and if he won't laff he wants az mutch keeping away from az a bear-trap when it iz sot."
—Josh Billings.

While we are more confident than ever that the tide of industry has turned, it must be remembered that only in two or three exceptional places in the whole world is there a tide even remotely similar to that in the Bay of Fundy. Fortunately, the tide usually comes in gradually and steadily. That is evidently the way the tide of business is rising.

Mr. Graf is doing the industry a fine service in trying to arouse more interest in the matter of mill photography. This is far more important than might be supposed. It can be made still more important and helpful by an organization of photographers so they can work out common problems and develope new lines of progress.

Reprints: The series of articles by Dr. J. S. Bates on the Use of Decayed Wood and Prevention of Rot in Pulp is now available as a reprint at 25 cents a copy.

Prof. Lloyd's article on The Structure of Cereal Straws has been reprinted. Copies are 25 cents each.

THE GOOD WORK GOES ON.

Mr. J. F. H. Wyse, General Manager of the Safety League has received the following letter from Mr. A. H. Sirks, Chief Commissioner of Police, Rotterdam, Holland:—

"On an exposition at the Safety-museum at Amsterdam, I saw your traffic bulletins No. 17 and No. 28. As dutch people yet need a great lot of education in traffic matters, I should appreciate highly to get in possession of material in this question for policemen's instruction and propaganda (f.i. showing lantern plates in cinemas).

"Will you be so kind as to inform me on which conditions I can secure myself different bulletins of your society, as shown on the above mentioned exposition.

"On thanking by forehand for your kindness,
I remain, Dear Sirs,
Yours very truly
"A. H. Sirks"
Chief Commissioner of Police."

The League is sending the Chief Commissioner a large amount of Safety literature.

Advances in the Practice of Lubrication*

By HENRY M. WELLS
and JAMES E. SOUTHCOMBE

The considerations which we wish to bring forward in this paper are the results of many years' experience of the problems of lubricating oil and lubrication, studied from a physico-chemical standpoint, assisted by an intimate and daily contact with the lubrication of all types of machinery and prime movers. Our primary object was to elucidate the reason for the obviously superior lubricating efficiency of fatty glycerides over "straight" mineral oils in a large number of practical cases which had come to our notice.

As a corollary to this we had to review the physical principles upon which lubrication depends and to seek an explanation of the peculiar property which has been called "oiliness," "body," etc., by authorities in the past.

It may not be out of place here to review the position of our knowledge of lubricants and lubrication.

Professor C. V. Boys, in his Presidential address to the Physical Society in 1908, crystallized the position very happily in these words:—

It was found that the lubricating property of oil depended on something which at present is unknown—It is not viscosity—animal and vegetable oils lubricate better, i.e., they are more 'slippery' than mineral oils of the same viscosity, and though the oil trade has known how to make good 'slippery' mixtures, no one at present knows what 'oiliness' is, and this is at the present time an important physical quest of the engineer."

Again Professor J. S. Brame has said that[1] "the property of 'oiliness' was one of the most puzzling of the properties of oils. By some it was regarded as unnecessary to connect it with viscosity directly, since it was possessed in a much greater degree by some fixed oils than by many mineral oils which had practically the same viscosity."

It is necessary to distinguish clearly between two distinct classes of lubricating practice. On the one hand we have the lubrication of fast-moving shafts, etc. supplied with a large excess of oil frequently under pressure, and in this case the frictional values are dependent primarily upon the viscosity of the oil: the mathematical and experimental investigation of these cases have been amply treated by Reynolds, Tower, Lasche, and others. On the other hand we have to deal with slow speeds at high bearing-pressures, frequently with a very limited supply of oil, and it is in these cases that the special property of "oiliness" or "body" is requisite to maintain the film, and it is here that viscosity measurements no longer assist us in the choice of the lubricant.

This view received unanimous support at the recent discussion on lubrication at the Physical Society.

Physical Properties of Liquids That Influence Their Lubricant Character.

What are the possible physical properties of a liquid which influence its character as a lubricant? They are viscosity, density, capillarity or surface tension, compressibility, and tensile strength. It is true that very little work has been done on compressibility and tensile strength, but from the observations of Worthington and others it would appear doubtful whether they would play a "distinguishing" role in the differentiation of oils; and ,further, as we shall point out, there is what appears to us an adequate explanation of the nature of oiliness without calling upon these properties.

So far as density is concerned there exists a wide range of petroleum mineral oils possessing specific gravities identical with those of the fatty or fixed oils, hence it is clear that density plays no determining part. Viscosity is, of course, of great significance in the cases of high speed, etc. just referred to.

Now it remained for Ubbelohde to point out that only a liquid which "wets" or "spreads over" the solid can constitute a true lubricant, because in order for the liquid to force itself into the narrower spaces of higher pressure it is essential on capillary grounds that the said liquid shall "wet" the solid surfaces.

Consider the case of two eccentric glass surfaces which are being forced together with a drop of mercury or oil between them. Now since the mercury does not "wet" or spread over the glass, the meniscus in this case will be convex to the liquid, while in the case of the oil which wets the surfaces, the meniscus will be concave. In the case of mercury the tendency on capillary grounds will be for the liquid to gather itself up into a drop and to pull the liquid film in the direction away from the narrower constricted area of greater pressure. In the case of oil the opposite will be the case.

This is exactly what is required in a lubricant, namely, that it shall penetrate into the narrow spaces between journal and bearing, and from the above considerations one clearly sees that liquids which do *not* "wet" solid surfaces cannot be described as lubricants.

Only those liquids which "wet" a solid surface possess lubricating power in the generally accepted sense.

Although these considerations appeared to indicate the connection between lubrication and capillarity, it will be seen that they only go so far as to enable us to say that mercury is not a lubricant and that oil is a lubricant. This is a conclusion of considerable theoretical interest, but it is not very helpful to the oil technologist who desires to differentiate between different classes of oils.

Accordingly we find that these speculations of Ubbelohde led to no practical result.

On the other hand, certain theoretical considerations had led to the conclusion that the permanence of liquid films depended upon capillary relationships, and in particular that *pure liquids would not show stable films.* These principles had not been applied, however, to the problem of lubrication, and, in fact, they were directly contradicted by prevailing practice in which there was a constant tendency towards greater purity, i.e., in the direction of refining the mineral oils which were used, and in the direction of using acid-free oil as a compounding ingredient.

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* Abstracted from journal Society of Chemical Industry, March 15, 1920, 51T-60T and reprinted from Canadian Chemistry and Metallurgy.

[1] J. Inst. Pet. Tech., 1918, 4. 219.

The generally accepted view was therefore that capillarity was not a deciding factor in connection with the phenomenon of "oiliness," and various standard works contain statements to this effect.

It was under these conditions that we began our experiments. We were at once met by the fact that it was not possible to measure the surface tension between oil and the solid metal bearing, and it is probably on this account that Ubbelohde's speculations remained abortive. The usual "surface tension" is that of oil against air, and we confirmed the results of previous investigators, viz., that the results so obtained, for instance, by observing the rise in a capillary tube, shed no light at all on the question under consideration.

At this point we decided to measure the surface tension of the oil against an immiscible liquid in the hope that this might furnish some criterion of "oiliness." On proceeding to measure this interfacial tension, i.e., the surface tension between oil and water, startling results were at once obtained. The method of experiment was by the drop pipette as follows:—The pipette consists of a U-shaped capillary tube provided with a bulb and a ground glass orifice. The bulb is filled with oil to the mark. By means of the capillary a very slow flow of oil may be obtained by opening the stop-cock. The orifice is immersed in a beaker of water, and the number of drops formed by a given volume of oil is counted. The surface tension oil-water is inversely proportional to the number of drops.[2]

A series of mineral oils were tested with this instrument, and then a series of animal and vegetable oils and compounded oils.

Th following table shows a few results selected from a very large number of trials:—

Table of Interfacial Tension by Drop Numbers of Various Oils Against Water.

Mean Temperature 70° F.

OIL	No. of Drops at constant orifice and head.	Tension in arbitrary units.	
Paraffinum liquidum	95	100	
0.905 mineral	101	94	Mineral oils.
Solar red mineral	102	95	
Non-viscous neutral	99	93	
Olive	132	72	
Rape	138	68	Fatty oils.
Coconut	161	59	
Lard oil	128	73	

A glance at the table shows the surprising fact that **the inter-facial tension against water of the vegetable and animal oils is much lower than in the case of a mineral oil.**

What is more, we were struck by the fact that we had here a test which showed a distinct physical difference between mineral and saponifiable oils independent of viscosity, density, etc., and this difference appeared to be in conformity with the lubricating properties of the oils.

It now remained to enquire what was the reason for the difference in tension. After considerable experimentation we proved that the lowering of the interfacial tension against water in the case of fatty oils was due to their slight content of free fatty acidity.

The following table shows some of the results:—

OIL.	Free fatty acids, calc. as oleic.	Drop no.	Interfacial tension.
0.905 mineral	nil	101	100
98% mineral + 2% com. fatty acids	1.9	125	80
97% mineral + 3% com. fatty acids	2.8	130	78
Olive	2.2	125	80
Olive	4.5	140	72
Rape	2.5	132	76
Coconut	4.1	148	68
Olive (neutral)	0.1	110	92
Rape (neutral)	0.15	108	93

By removing the free fatty acids from the saponifiable oils the tension rises, and by adding free fatty acids to the mineral oil the tension can be lowered.

Now, all commercial animal and vegetable oils contain small quantities of free fatty acids, and even if the utmost care has been taken in refining to remove the acidity, hydrolysis soon sets in and free acids are formed which, in even relatively minute quantity, suffice to lower the surface tension.

The following table shows the percentage of free fatty acids in representative samples of animal, vegetable, and compounded oils on the market:—

	Acidity (as oleic)
Animal oil, pale	4.2 to 25.55
Animal oil, brown	12.02 to 30.32
Castor, first	0.49 to 1.70
Castor, seconds	2.2 to 7.40
Coconut, Cochin	1.26 to 19.11
Colza, Belgian	1.97 to 3.22
Colza, Stettin	1.41 to 4.48
Lard, pressed	0.28 to 0.71
Olive oil, Algerian	2.52 to 13.72
Olive oil, Gallipoli	12 to 33.14
Palm oil	24.68 to 56.05
Palm oil bleached	14.1 to 27.49
Rape oil, Black Sea, refined	1.82 to 4.34
Rape oil, East India	1.26 to 4.24
Sperm oil, Arctic no. 1	0.56
Sperm oil, Arctic no. 2	0.42 to 4.34
Sperm oil, Southern	0.7 to 2.86
Tallow	1.55 to 43.71

Standard Brands of Compound Oils on the Market:

	Acidity (as oleic).
Marine engine oil, D	1.3%
Marine engine oil, O	5.15%
Marine engine oil, T	4.5%
Motor oil, X	0.26%
Motor oil, Y	0.5%
Motor oil, Z	2.5%
Compound steam cylinder	0.4%
Medium gas and oil engine oil	0.25%
Medium gas and oil engine oil	0.39%
Light gas and oil engine oil	1.6%
Light gas and oil engine oil	1.3%
Heavy gas engine oil	1.28%
Heavy gas engine oil	2.5%
Oil engine oil	0.7%

The above table is representative of the general glycerines and commercial compounded lubricating oils in daily use on all types of power plant, and we see that fatty acids are always present to a certain extent. From the foregoing it is demonstrable that:—

1. Capillary effects (hitherto ignored in lubrication) play a fundamental part.

[2] Donnan, Zeit,, f. Physik. Chem. vol. 31, etc.

2. The presence of fatty acids in an oil lowers the surface tension of said oil against water.

3. A neutral glyceride possesses a similar tension to a neutral mineral oil.

4. The addition of a relatively minute amount of a fatty acid to a neutral mineral oil reduces the tension to that of a commercial animal or vegetable oil or compounded lubricating oil.

Lubrication of Solid Surfaces.

Now it remains to enquire how far these results influence the theory and practice of lubrication of solid surfaces. It might be argued that the interface between oil and water is a different thing from the interface between oil and metal, and that the conclusions drawn from the one case are not necessarily applicable to the other. As a matter of fact such similarity in effect is not unknown in other instances, and to obtain more conclusive evidence Professor Lewis has measured the interfacial tension between oil and a liquid metal—mercury. (It should not be forgotten that solid-liquid interfacial tension cannot be measured.) His results are as follows:—Pure mineral oil, 100; same mineral oil plus 2% of commercial fatty acid, 89. It is seen that again there is a lowering in the interfacial tension as a result of the addition of the organic acids, and, what is more striking, the relative lowering produced is very much the same as it is in the case of an oil-water interface.

Professor Lewis remarks: — "One may conclude therefore with some confidence that the addition of the organic acids will lower the tension at any metal-oil interface."

Again, as already pointed out, the permanency of films is dependent upon a diminished interfacial tension between the oil and the metal in contact therewith. If such a film is broken the possibility of its uniting again to form an unbroken layer depends entirely upon the interfacial tension being low. Any substance which lowers the interfacial tension causes the liquid to spread over a larger area of the solid. It follows therefore that if a substance be added to an oil which brings about a lowering of interfacial tension, such addition will act favourably as far as lubrication is concerned by preventing in turn the metals coming into direct contact.

The capacity for spreading may be considered as partly physical and partly chemical, due presumably to residual valency. The effect is to render the transition layer between the liquid and solid less abrupt. This diminution in abruptness can be brought about by chemical action direct or indirect across the transition layer or by the solubility of some third substance in both phases.

H. S. Allen has recently pointed out that on Langmuir's view oiliness depends on the chemical forces called into play between the active part of the oil molecule and the solid surfaces of the bearing.

Now it is obvious that there is a tendency for chemical activity between the metallic surfaces of bearing and journal and an oil containing free fatty acidity, while such tendencies are less pronounced in the case of a neutral mineral oil. Such a tendency would render the transition between oil and solid surfaces less abrupt, would manifest itself by reduced interfacial tension and would result in better spreading and consequent increased efficiency in lubrication.

There is little doubt in our minds that the physical rationale of the property of "oiliness" is now explained, and we have confined ourselves so far to a statement of the physico-chemical experiments which we have made and to the development of the physical theory.

Conclusive as it appears to us we have proceeded to test and verify the conclusions by direct friction measurements, and finally by the only real touchstone, namely, the test of experience in a long series of practical trials on all types of machinery and prime movers of the very largest sizes.

Results Obtained From Friction Measurements And From Trials On All Types Of Machinery.

Results, which show that 1% of free fatty acids of rape oil added to mineral oil are as effective in reducing the value of the frictional co-efficient as is the addition to the mineral oil of 60% of the neutral rape, are striking confirmation of the above described principles, and coming from a totally independent and unbiassed experimenter afford great support to our contention that it is not the glyceride but free fatty acids in a compounded oil which improves its lubricating value.

Through the courtesy of one of the largest engineering firms in the country we have been enabled to make a series of measurements in a large friction testing machine, the results of which we here reproduce:— The test journal of the machine—which is of the Thurston type—is 3.8 in. diameter, giving approximately one foot peripheral speed per revolution. The length is 6½ in., and in all our experiments the load was 200 lb. per sq. in. The machine is provided with a revolution counter and a drum upon which the reading of the arc is automatically traced. The driving motor was operated by a variable speed controller, and all care was taken to ensure steady and constant speeds. The journal and bearing were thoroughly cleaned befor each test by washing with toluol, and finally rotated against velvet pads to remove all superficial dust and moisture. The experimental temperatures was kept between 60° and 64° F.

The values of the frictional coefficients calculated from the curves obtained directly from the machine are given in the following table.

By way of illustrating our point, four oils were chosen of identical viscosity and density but differing in composition thus:—

These results afford great support to the views expressed above, and, coupled with our experience in practical lubrication, about to be mentioned, confirm our explanation of the property of oiliness and open out a new and invaluable field in the manufacture of lubricating oil.

We should here mention that this principle of making lubricating oils by adding to mineral oils small quantities of fatty acids or substances which lower the interfacial tension has been accepted by the Patent Offices in all countries.

We should add a word here with regard to the possibilities of corrosion.

As will be observed from the table, all compounded oils which have been and are in daily use for years contain notable amounts of free fatty acidity, yet one rarely hears of any active corrosion.

In our case we add only very minute amounts of fatty acids, and the quantity is strictly limited and controllable. But where fatty glycerides are employed the amount of acidity which can form is potentially very large because hydrolysis is constantly going on, giving rise to the production of free acids.

	Viscosity at 60° F. Second Redwood.	Sp. gr. at 60° F.	Total acidity calc. as oleic acid.	Mean temperature of expts.	Peripheral speed in feet per minute.	Quantity of oil used for test.	Arc.	Coefficient of friction.
A. Pure mineral	973	0.909	nil	62	11	5 c. c.	40	0.0084
B. 97% Pure mineral . . 1% Pale cylinder* . 2% Com. fatty acids	973	0.909	1.9%	62	11	5 c. c.	25	0.0052
C. 80% Mineral . . . . . 20% Olive.	980	0.908	0.3%	63	11	5 c. c.	40	0.0084
D. 40% Mineral . . . . 60% Olive	970	0.907	0.9%	64	11	5 c. c.	35	0.0073

* Added to keep the viscosity constant.

During recent years a great deal of attention has been devoted to the study of the colloidal characters of the fatty acids, and it has been shown that while the lower members of the fatty acid group possess relatively little colloidal character, the higher members are highly colloidal in character. Donnan and Potts have shown that there is a gradation in these properties as one ascends the scale, lauric acid occupying a sort of intermediate position. Also the lower members of the series possess strong acid characteristics, while the higher members are very weakly acid. Now the fatty acids which occur in commercial oils are never pure chemical individuals, but are mixtures in varying proportions of a considerable number of fatty acids. Coconut oil, for example, is characterized by containing appreciable percentages of the lower members of the series, while rape oil rarely contains anything but the higher members.

It is only to be expected, therefore, that the behavior of these oils will differ in accordance with the fatty acid groups which predominate in them, and it is possible to reproduce the capillary properties of any particular animal or vegetable oil by adding suitably chosen fatty acids to mineral oil.

Consider the case of a steam engine using saturated steam, where there is a tendency for condensation of water to occur in the cylinder and valves. It follows in such a case that the presence of a substance in the oil which lowers the surface tension against water will in such circumstances assist in the formation of oil films by enabling the oil to spread more readily or by overcoming the tendency of the water to wash the oil film off.

There is a certain type of lubricant phenomena to be considered where the oil is brought into contact with water and it is desirable that the oil shall either separate itself rapidly from the water (de-emulsification) or, conversely, that it shall mix or emulsify with the water.

Now the phenomenon of emulsification is dependent upon the colloidal properties of the oil, while de-emulsification is brought about by a greater concentration of hydrogen ions. Consequently one would expect the oil containing the higher members of the fatty acid group to possess an emulsifying tendency, while one containing the lower members will possess a de-emulsifying tendency. This is a feature which we have tested by shaking oils and water at various temperatures for long periods of time, and to a great extent we have been able to substantiate this view as the result of experiments.

After the soundness of our theory was clearly demonstrated in the laboratory it remained for us to put it to the touch of actual practice to prove its real value in the world of engineering.

Not a single failure has occurred in practice of an oil or an oil "essence" made on the "germ process" as a reliable lubricating oil when used for the purpose for which it was supplied. The meaning of "oil essence" is explained later.

We use the expression "germ process" to describe the oil made by using one or more fatty or other acids with one or more mineral oils, because the world has been taught for generations to look upon acid as the deadliest enemy to good and safe lubrication. As the germ is the first principle of organic life, by analogy we call a suitable acid when dissolved in mineral oil the "germ", which gives to mineral oil its life and activity as a more perfect "instrument of lubrication."

We do not claim that a "germ process" oil is better for all conditions of lubrication, but for many purposes where lubrication depends upon the oil alone and not upon any mechanical means, such as pressure, to maintain a continuous film.

We have proved to our entire satisfaction that the addition of fatty oils to mineral oils for any purposes of lubrication is unnecessary, and a waste expense of valuable material, and that for such purposes oils combining small percentages of suitable free fatty acid or acids with suitable mineral oils are at least equal to oils compounded on the old formulæ for those purposes. Therefore many of the formulæ and specifications for compound oils are obsolete. When the expression "compounded oils" is used, it indicates such old formulæ oils. Also, "mineral oil" indicates in many cases one or more than one mineral lubricating oil. "Fatty oil" includes tallow and other "fats" used for lubrication.

Gas Engines.

It has always been considered that the addition of coconut oil to a mineral oil gave the best results. Refined rape oil or other fatty oil to the extent of about 5 per cent of each; that is about 10 per cent of fatty oil, 90 per cent mineral oil. Especially on large horizontal units such a compounded oil was deemed essential. For smaller units smaller proportions down to 5 per cent total fatty oil to 95 per cent mineral oil; though some small units apparently required heavily compounded oils

So far as our business is concerned, "germ process" oils have entirely displaced such compounded oils for horizontal and vertical engines up to the largest units of both types.

Some gas engines run on "straight" mineral oil with good results, but roughly it can be claimed that ten units run on "germ process" oil to one on straight mineral.

Oil Engines.

Compounded oils, and for some types "straight" fatty oils such as oilive oil, have been considered essential for oil engines. For several types it was thought necessary to use a compound of *one-third rape oil* to two-thirds mineral oil. That oil has been entirely superseded by an oil with a slightly higher percentage of fatty acid than the average "germ process" oil for oil engines, but not over the maximum considered safe in practice. For other oil engines, land and marine, their place has been taken by oils made from one or more fatty acids with mineral oils of suitable quality.

The quality of the mineral oil with which the acid is blended is a very important factor in lubrication. The germ process gives to a mineral oil of fair merit that property lacking for some purposes; while it increases the lubricating value of a "good" oil, making it still better for many purposes. In both cases they become more economical.

Stream Cylinder Lubrication.

It is almost universally considered that for "perfect" lubrication of steam cylinders with certain types of valve gear (as one example, "Corliss"), and for engines working under certain conditions— say with much condensation in the cylinder — a compounded oil is essential.

"Germ process" oil incorporated in very small proportion with the correct mineral cylinder oil gives equally good results on engines with Corliss valves up over 3,000 h.-p. working at 160-170 lb. per square inch pressure, superheated 480-500 degrees F.; on horizontal engines with Corliss valves up to 750 h.-p. up to 160 lb. pressure without superheat. Various mineral cylinder oil bases to correct "germs" in different but small proportions give thoroughly good lubrication on vertical and horizontal engines of many types, sizes, and pressures.

Oils For Steam Turbines, Crank Cases Of Vertical Steam Gas, and Oil Engines.

The property most essential in oil for steam turbines, namely non-emulsification, is the one which largely governs successful crank-case lubrication in vertical engines. In such cases and in turbines water from condensed steam or from the cooling system falls into the crank case and gets "churned" as it is pumped round with the lubricating oil. For these conditions one has to know something about impurities in the water, as the water is the deciding factor. The "germ" must be carefully adapted to the water as well as to the oil, and the oil to the mechanism. Where one oil is used for cylinder and crank-case lubrication (say, of gas and oil engines) the "germs" can be balanced to give what for convenience can be described in a general way as a positive effect in the cylinder where extra capillarity is required, and a negative effect in the crank case where emulsifying is undesirable, and where the engine is steam, of the splash lubrication type, to give just enough emulsion and no more for its intended work in the cylinder, also in the crank case, where it must emulsify. The germs, for there are many, can be so adapted when one thoroughly apprehends their properties, to give perfect lubrication in all such cases.

Marine Steam Engine Bearings—Open Type.

For a good heavy marine engine oil it has always been considered necessary and is so to-day, to use from 10 to 25 per cent thickened or blown oil — as a rule, thickened rape oil. This gives great viscosity, also very good "lathering" properties to the oil.

The standard specification for marine bearing oil for one of our semi-Government departments is a compound of about 20 per cent "of fatty oil", but the total fatty acid content must not exceed 1 per cent. This has now been successfully replaced by "germ-process" marine-engine oil.

On February 5, 1918[3], we filed our patent for oils made on this new process, and immediately its "publication or communication" was prohibited by the Admiralty, who carried out trials over many months on about fifteen ships of the mercantile marine, including a fair proportion of liners. The result was quite satisfactory.

At this stage we decided to supply the fatty acids in a form, which we term "essence", mixed with mineral oil and which can be conveniently used on board ship; about 2½ per cent is added to the mineral oil as required. The result justified all claims. The consumption of mineral oil was considerably reduced, hot bearings were cooled, and thrust blocks were kept cool by the addition to mineral oil of suitable "germs". The trials were a complete success.

We think it desirable to say that it may not be advisable for oil users in general to buy fatty acids, to mix them in their oil and imagine all advantages mentioned will accrue. Suitable acids must be chosen for the purpose.

Conclusions.

We have shown (1) that fatty compounded oils are unnecessary for many purposes of lubrication; (2) that fatty oils are not essential for such work; (3) that fatty acids can entirely and completely displace fatty oils for those purposes.

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[3] Eng. Pat. 130,677; see J. S. C. I., 1919, 674A.

GUMMED TAPE MAKERS JOIN PERFECT PACKAGE CAMPAIGN.

Chicago, Ill., Nov. 2.—Perfect packages packed in paper formed one of the topics of the gummed paper manufacturers of the United States this morning when the Gummed Paper Manufacturers Association announced that it would participate in November's observance of perfect package month as planned by the American Railway Association and the American Railway Express.

A unique example of the use of gummed paper was brought out in the report that gummed paper tape is now being used to seal cases of clothing and cloth fabrics to protect the contents from injury by dirt or moisture through the cracks of the cases. Many such cases are made of very thin wood, some of three-ply plywood, and the gummed tape is being extensively used in the east to hermetically seal such packages.

Government experiments on fruit and perishable vegetable shipments in packages sealed with gummed tape were also reported to be under way, but the testing experts have not as yet been able to determine proper specifications for fruit shipping cases made of corrugated fibre or other paper boards.

A study of gummed tape, as compared with twine for wrapping shoes made by a big national company was reported at the convention of the association, showing that the saving made by the use of tape instead of twine on half a million pairs of shoes was $1,556.

Often it is not the greatness of thy trouble, but the smallness of thy spirit that maketh thee to complain.—Seneca.

Chemical Investigation of Cellulose

Suggestions by Mr. Arthur Baker, Chairman of the Technical Section of the British Paper Makers' Association, at the Edinburgh Meeting.

As papermakers, we should remember that cellulose is a typical colloid, and that the majority of chemical reactions which take place in living matter occur catalytically in colloidal media. Fundamental investigation or research is vital for industry to-day, and as Dr. Macdonald truly remarks, it is significant that the discoveries made in the pursuit of knowledge for its own sake have so far had the most far-reaching effects. That is very good reason why technologists and those employed in the technical application of science to industry should keep one eye fixed on the rapidly-growing knowledge of the mechanism and process of nature, which can only be acquired by the patient work of the physicist, chemist, and mathematician in their laboratories and studies.

Dr. Macdonald asks is there a field for fundamental research in the paper industry. I answer that the value of experimental methods may be accepted as beyond all question, but that the time has not yet come when empirical methods can be dispensed with in paper manufacture and many other industries, because owing to the lack of fundamental research in the past we are not sufficiently informed about the materials we are using in everyday practice. Cellulose, the basis of our industry, is a comparatively unknown substance. Notwithstanding what I have said, it is very largely due to chemical investigation that the paper industry has reached the enormous dimensions of today. It is doubtful whether and modern chemical discovery has such a rapid success of pronounced industrial value as the chemical production of wood pulp rendered possible by the work of Tilghmann, Pictet, Ekman, Mitscherlich —period 1875-1880.

It is true the formation of the web of paper has attracted a great deal of attention, probably because news-print must be made at a high speed as a commercial proposition, but ask an intelligent beaterman in a fine mill what he has to say about the formation of the sheet, and you may be surprised at his answer. The fact is that the hydration of paper stock is a great problem in the paper mill, and all the factors which enter into play await elucidation.

Mr. Gemmell thinks it is now time we focus attention on some particular line of work. I suggest this problem of hydration is the problem upon which we can most usefully focus the mind of the research worker, and if the necessary work is carried out I venture to predict that the next big advance in the technology of the beating process by the application of chemical methods.

Dr. Macdonald has pointed out the subject is receiving attention on the Continent and in the United States. The question has been touched upon by a few British workers, although little has been published.

It has always been a subject I have been personally interested in, and it was arising out of enquiries in this direction that I was led to critically examine the ultimate structure of esparto and other fibres, although I soon came to the conclusion that help from the microscopo was very limited and that the subject should be examined from the chemical side. Three facts always pointed in that direction.

I. Manilla becomes rapidly hydrated to a high degree when used in the ordinary way, but when highly purified does not hydrate so readily.

II. Imitation parchments are usually made from sulphite boiled by the Mitscherlich process as distinct from the Ritter Kellner. As you are aware, the latter produces a purer but freer pulp.

III. Under-boiled pulps, such as Kraft pulp, readily hydrate.

In other words, cellulose pulp from different sources contain certain residues of lignone compounds or other cellulose derivatives all more readily hydrate than cellulose pulp of a high degree of purity. Certain residues appear to render the pulp more reactive to water during the beating process.

Like Dr. Macdonald, I have followed Schwalbe's researches with keen interest. He concludes definitely that hydro and oxycellulose are chiefly concerned in process of hydration and states that Mitscherlich pulp treated with two per cent. of its weight of sodium nitrite in solution, acidified and allowed to stand before beating, hydrates very rapidly when beating is commenced. If these investigations are confirmed and you may be sure they will be tested, they will have a profound effect upon present beating practice—and may become a classic example of the value of Fundamental Research.

Another interesting fact which has emerged from recent investigations is that all fibre substances take up a higher proportion of hygroscopic moisture from a saturated atmosphere the greater the degree of hydration. In the case of Imitation Parchment the increase is as much as 12 per cent. It is suggested this fact might form the basis of method of measuring the hydration of the finished sheet of paper.

There is a comparatively untouched field for research in hydration problems. What we term ligno cellulose, pecto cellulose, muco cellulose, etc., comprise a range of cellulose derivatives existing in the vegetable world in the form of highly reactive collodial systems of a carbohydrate nature. Their true relationship to pure cellulose, a most inert substance, is unknown These bodies and the chemical differentiation of the substance composing the cell walls and their contents are practically an unexplored field—the ground has merely been scratched.

As papermakers we are vitally interested in these problems. The prospect of being able to hydrate the fibre almost unreduced in length and even to profoundly modify mechanical pulp itself, is surely one which will appear to every papermaker.

AN OUTING FOR CANADA'S LUMBER KING.

One of the most interesting visitors that we have had in town for years was J. R. Booth, of Ottawa, the oldest and best-known lumber and paper manufacturer in Canada. Mr. Booth is now in his 95th year, is hale and hearty, and takes as keen an interest in business affairs as he ever did. He came to Buckingham by motor, spending the afternoon, and returning the same way. He said it was the first time he had visited Buckingham, although he had been trying to get here for the last twenty years, but the boys at home did not seem able to let him a day off. Mr. Booth, even with his advanced age, carefully inspected the whole of The James Maclaren Company's plant, and showed a keen interest in everything that was being done, commenting favorably on the many labor-saving devices.—Buckingham (Que.) Post.

Vulcanized Fibre and Its Uses

By A. R. R. JONES.

On Carlaw Avenue, Toronto, is situated the plant of the Diamond State Fibre Company of Canada, Ltd. This is a daughter company of the Diamond State Fibre Company, which is the largest manufacturer of vulcanized fibre and vulcanized fibre products, and carries the world's largest stock of both. The products of this big concern, which has mills and factories at Bridgeport, Pa.; West Conshohocken, Pa.; Elsmere, Del.; Boston, Mass.; Maidstone, England, London, England; are manufactured in Canada at the Toronto plant on Carlaw Avenue. The officers of the Canadian Company are as follows: Mr. J. M. Taylor, president; Mr. W. H. Taylor, vice-president; Mr. T. E. Webster, director of sales and general manager; and Mr. L. T. McCloskey, secretary and treasurer.

The writer was taken over the Toronto plant by Mr. Webster, the general manager, and exceedingly interesting he found it. One need be no prophet to see clearly that the Company is bound to develop rapidly, and that the growing use of the products it manufactures is going to constitute a far from unimportant chapter in the history of Canada industry. For the constantly changing conditions of modern industry are demanding materials of unusual properties. It is the distinction of the vulcanized fibre known as Diamond Fibre that it can satisfactorily meet a large number of these diverse and severe requirements. Indeed, to one like the writer who has been given the opportunity of seeing something of the wide range it is capable of covering in manufacturing utility, its applicability in the industrial field seems almost unlimited. In common use today there are literally thousands of commodities which are made wholly, or in part, of this substance. In the electrical, mechanical and transportation fields alone, Diamond Fibre is already playing a highly important part. The part that it is destined to play in almost every sphere of industrial activity will be more important still. For manufacturers everywhere are recognizing its value, and are utilizing its highly remarkable properties, as to which a word or two will be said presently, in a great variety of products.

What Diamond Fibre Is.

Diamond Fibre is made from cotton cellulose, chemically hydrated, and a selected stock of cotton rags forms its base. Certain combinations of rags are selected, in order to make the different kinds of fibre. They are sent through large dusters, and then to the sorting-room where they are re-sorted. They are then, when sorted, put through heavy rotary cutters, which cut them into fine pieces. These pieces are cooked in large rotary boilers, cleaned by washers, and broken up into pulp by "beaters." During these processes, every care is taken to remove all foreign substances from the stock, which is then passed through continuous paper-making machines, where it is formed into flat, wet sheets and then dried. These sheets are wrapped into rolls, unwound by the fibre-making machines and run through an acid bath. The chemical process turns the sheets of cotton cellulose into sheets of Diamond Fibre, which material has a dense, tough, homogeneous texture. The sheets of fibre are then cut off the fibre machines and the acid with which it is still saturated is removed by a lengthy process which sometimes takes over a year to complete. The Diamond Fibre sheets are then dried, pressed flat, rolled and put into stock for seasoning.

The Material's Unique Properties.

As a new raw material Diamond Fibre has properties that make it superior for many purposes to steel, brass iron, tin, wood, hard rubber, leather and many scarce and costly materials. It should not be confused with wood pulp "fibres", which are generally used for such purposes as wall coverings, shipping cases, etc. Diamond Fibre is basically an entirely different and unique material. It is a superior grade of vulcanized fibre. It is tougher than horn, almost as hard as iron, yet lighter than aluminum. Its unusual toughness is especially noteworthy. No ordinary force can cause it to dent, crack, split, break, or splinter. It actually improves with age. It is impervious to oil and grease, is unaffected by all ordinary organic solvents, and will not crystallize under severe vibration.

Its tensile strength is 12,000 to 15,000 pounds per square inch; its resistance to compression about 40,000 pounds per square inch; its shearing strength about 10,000 pounds per square inch; and its dielectric strength 200 to 400 volts per mil of thickness. No other material, it is claimed, can favorably compare with Diamond Fibre in the relation of its weight to its tensile strength. The fact that it is used as a dielectric by the world's largest motor manufacturers is evidence of its reliability in insulation. It is non-corrosive. Diamond Fibre does not deteriorate if subjected to moisture or submerged in water. It expands somewhat, but after drying it recovers its approximate normal dimensions and weight.

Diamond Fibre contains no grit, dirt, or foreign substance such as would obstruct any machinery process, or injure its insulating property. It may be sawed, bored, drilled, turned, topped, threaded, milled, punched, or worked into various shapes, but it cannot be molded. It takes a high, smooth, glossy finish. It is made in three colors—grey, which is its natural color, jet black and deep red.

Forms and Grades of Fibre.

Diamond Fibre as a basic material is produced in three primal forms—sheets, rods, and tubes. These forms are fabricated or machined into the numerous and various special parts for which Diamond Fibre is especially applicable.

An important feature of Diamond Fibre is the different grades in which it is produced to meet various requirements. The particular grade required can be obtained only by applying the right chemical treatments to the right quality of cotton cellulose. For example, the trunk manufacturer requires a grade of fibre different from the grade suitable for making gears.

Diamond Fibre is made both hard and flexible, with variations of each grade to meet required specifications. The Hard Fibre, which is used primarily for mechanical and electrical purposes, is the toughest and strongest grade of vulcanized fibre that can be made. Several different grades of Hard Fibre are made, and each grade possesses qualities that make it particularly suitable for the special use to which it is designed to be put. For example, there is one special grade to take stamping and light punch press work. Another is suitable for making difficult shapes such as require very fine machining, and rods made from this grade are used extensively for the making of small parts in automatic machinery. Diamond Flexible Fibre is a soft and pliable material, the degree of flexibility of which can be varied to meet special requirements. It is used extensively for the making of small parts in automatic machinery, Diamond Flexible Fibre is a soft and pliable material, the degree of flexibility of which can be varied to meet special requirements. It is used exten-

sively for packing, such as washers, gaskets, etc.

Uses of Machined Parts.

The user for Diamond Fibre sheets, rods and tubes in the manufacture of special machined parts are exceedingly numerous at present, and new uses are being developed daily. The Company at its Toronto plant, operates departments for machining special parts from Diamond Fibre in its basic forms of sheets, rods and tubes. Gears, fuse casings, track insulation, flanged and threaded bushings, washers, timer rings and so forth, are machined according to required specifications. Moreover, the Company's experts in its specialty departments are continually designing parts required by customers. Manufacturing firms find the knowledge and experience of the Company's experts and its comprehensive technical facilities invaluable in the solution of their special production problems present, and, in particular, in the matter of advice as to how either a saving in production or an improvement in product, or both can be effected.

Machined Parts for Textile Mills.

Diamond Fibre is specially suited for making textile specialties because it is entirely free from splinters; it has a smooth, glossy surface that improves with use; its color is in-built, and, therefore, does not run and injure fabrics; its light weight and strength cut down the bulk of the special part. It is now in general use in silk, woollen, cotton, artificial silk, hemp, and jute mills for a great variety of purposes, such as spool heads, bobbin heads, bobbin boxes, loom picks, shuttles, swift braces, shuttle box liners, thrust washers, lacing combs, gears, picker stick ends, spindle guards, etc. Besides the various specialties used in textile mills. Diamond Fibre is extensively used in the manufacture of receptacles of all kinds for the textile industries. Among these receptacles may be mentioned the Diamond Fibre truck, which is extremely suitable for use in textile and other mills, as it constitutes a superior transportation system for the quick and convenient handling of raw and finished material; the Diamond Fibre barrel, which is strong and durable, as well as light and easy to handle; the Diamond Fibre basket, very valuable as an accessory in textile mills for catching and holding manufactured articles as they leave the machines; the Diamond Fibre roving can, either seamless or riveted, and frequently used, as a container for waste, in place of the larger barrel; the Diamond Fibre delivery case; and the Diamond Fibre waste basket.

Electrical and Automative Uses.

In the electrical field, Diamond Fibre finds one of its most notable spheres of application, not only because of its superior insulating qualities, but also because of the great ease with which it can be machined into the many intricate shapes required by the electrical industries. It has an electrical resistance of 200 to 400 volts per mil of thickness. Among the many electrical uses in which it has proved valuable are cleats, switch handles, slot wedges, bushings, knobs, fuse casings, insulation for armatures, track insulation for block signal systems and railway equipment, lighting arresters, wire conduits, etc.

Diamond Fibre has an extensive use in the automotive field for numerous special parts. It is particularly suited for this industry on account of its imperviousness to oil and grease; its high dielectric strength; the ease with which it takes extreme machining; and its great strength combined with light weight. It is chiefly used for special parts in ignition, lighting, and starting systems for manifold tubes, wire cleats, switch handles, bushings, terminal blocks, gears, timer rings, fuse plugs, etc. It is used to make gaskets for radiator cups. Other uses are for clutch linings, brake bands, friction discs, radiator gaskets, handles of various kinds, etc.

Discs and Washers and Handles.

Diamond Fibre Discs and Washers are another important branch of the special parts in the manufacture of which Diamond Fibre is used. These are furnished in thicknesses from .005" to 2", and in every diameter up to 48". They are furnished with rough-punched, smooth-shaved, band-sawed or lathe-turned edges, as required. Diamond Fibre Discs and Washers have a wide range of utility; for example, the bibb washer for spigots, and the thrust or bearing washer on heavy machinery. They are in general use from the small washer used in the manufacture of a delicate piano action to the heavy washer used to produce a gear or pinion.

Handles, of all sizes and shapes, are made of Diamond Fibre in lieu of rubber, ebony and composition. They are tough, strong, light and unbreakable, and, as Diamond Fibre is a non-conductor of heat and electricity, the user is protection against shocks and heated parts. Crank handles, switch handles, control handles, percolator handles, knife handles, gauge cock handles, brush handles and handles for electrical and mechanical equipment of all kinds, are some of the handles which are made of Diamond Fibre.

Wheels and Casters and Gears.

Diamond Fibre wheels are in great demand because they do not injure hardwood, concrete or mosaic floors, and because they eliminate much of the noise incidental to most transportation systems. They give good service and are extremely durable. They are also much used as pinions in direct motor drives, as they eliminate much of the lost motion due to belt slipping. Casters of Diamond Fibre are used for cabinets and other articles of furniture. They are practically indestructible and do not need lubrication.

Numerous tests, under all sorts of conditions, have proved that, in addition to its many other uses, Diamond Fibre is well adapted for making gears of all kinds, from the small sizes used in vacuum cleaners, paper folders, silk and knitting machinery, to the heavy service pinions used on machine and motor drives. However, in order to get the best results, it has been found necessary to make a special grade of Diamond Fibre. This special grade is a dense fibre of relatively high specific gravity. Its dense texture, high tensile strength, unusual wearing qualities, low cost, together with its slight elasticity, make it a very satisfactory gear material. An important feature is that these Diamond Fibre gears are niseless.

Condensite Celeron and Oil Celeron.

It is impossible, owing to space consideration to treat of all the products of the Company. But mention should not be omitted of the two waterproof fibres that it is producing, known as Condensite Celeron and Oil Celeron. The former possesses the dielectric properties of the well-known condensite moulded products, combined with the general properties of Diamond Fibre. Unlike moulded products, Condensite Celeron can be readily machined. The many uses to which it can be adapted are, therefore, quite obvious. This material is hard, tough, homogeneous and relatively non-hydroscopic. An average test piece will absorb less than 0.8 per cent water on a 24-hour immersion.

It is insoluble in all of the ordinary organic solvents. Its dielectric strength averages between 700 and 1,000 volts per mil of thickness. It will withstand a temperature of 300 degrees Fahrenheit without deterioration. Oil Celeron is simply Diamond Fibre chemically impregnanted with oils of various qualities instead of Condensite, which impregnation gives the material a certain flexibility and makes the fibre water-proof.

Should Paper Makers Take All the Loss?

(Contributed.)

In discussing the reasonableness or otherwise of the present price of newsprint (other than that dependent for its cheapness on debased European exchange) Mr. E. P. Adler, chairman of the A.N.P.A. Paper Committee, in Buletin No. 4487, intimates that the paper manufacturers should themselves be willing to suffer whatever loss may be involved in writing off their inventories in order to conform to the current cost of raw materials and to bring newsprint down to the price at which, in Mr. Adler's opinion it ought to be sold.

"It is true that some mills have on hand a large supply of high-priced wood and under contract some high-priced coal," he says. It seems to him, he adds, that they must take their losses on those high-priced materials the same as other business institutions have had to do," in order to get back to normal."

Conceivably there might be some reason in Mr. Adler's contention if the newsprint manufacturers, or the great majority of them, had been permitted to conduct their business in their own way throughout the period of abnormal prices the same as the manufacturers of other commodities. Unhappily such was not the case. For the greater part of this period the price of newsprint in the United States and in Canada was under control—in the former country through the Federal Trade Commission and in the latter through the Government Paper Controller. In both countries price-fixing was prefaced by prolonged proceedings. In both, the principal bone of contention was as to whether manufacturing costs and rate of return should be predicted upon the current cost of investments and of raw materials or upon their actual cost at the time or purchase. It was in evidence that pulpwood had to be harvested from one to three years prior to its absorption in the manufacture of paper. It was shown that wood costs had advanced very materially since the wood under consideration had been gathered. The manufacturers contended for the right to take in their inventories at current market prices or replacement value. The newspaper publishers as strenuously opposed this view in favor of charging them in at their actual cost. The records are filled with page after page of evidence and arguments on this point.

The publishers introduced in both proceedings numerous "expert" witnesses in support of their views. "These witnesses," says Mr. Guthrie B. Plante (the American publishers' chief counsel) in summing up in his brief, "each and all, repudiated the basing of returns upon inflated values obtained through appraisals upon the basis of replacement costs in periods of war or other great financial disturbance."

Mr. W. N. Tilley, K.C., the Canadian publishers' lawyer, in his brief, summarizes the manufacturers' contention thus: "The main argument advanced in support of the replacement theory was that if effect were not given to it the manufacturers would be left with large stocks of high cost wood at a time when the selling price of paper might be falling," whereupon he proceeds to show the "absurdity," as he characterizes it, of any such claim.

The publishers' views prevailed. The manufacturers, who foresaw the time when their position would be reversed, were denied the right to protect themselves against it. They were not allowed to increase their selling price with the rise in the cost of their raw materials or to prepare for the inevitable fall in prices which they knew must follow. They find themselves with high-cost inventories on hand which the publishers now say should be liquidated at the manufacturers' sole expense. Naturally the manufacturers can't see it that way. The circumstances afford an additional illustration of the folly of interfering with the laws of trade. Had the publishers been willing to allow the paper manufacturers to adjust their selling price to the rising value of their raw materials, the manufacturers would now be in a position to adjust their selling price downward, to meet the publishers' demands. They didn't do it and no blame can now be attached to the manufacturers for seeking to incorporate the actual cost of their wood in the selling price of their paper as they were forced to do when it was to the consumers' interest.

It is also pertinent to point out that in assuming to advise newspaper publishers against entering into contracts for their next year's requirements of newsprint in the expectation of much lower prices the A.N.P.A. Paper Committee is taking on a grave responsibility, since it is quite possible that their advice may turn out just as disastrously for the publishers as did similar advice tendered by the A.N.P.A. Paper Committee in 1917-18. That committee, it will be recalled, began in August, 1917, to instruct the publishers not to contract for the following year's paper at the then prevailing prices, arguing that lower prices were inevitable. In November, 1917, the Committee then, as now, reported an excess of newsprint in sight for the next year with greatly increased production certain. In a bulletin issued November 22nd of that year they urged publishers to refrain from making contracts, and on December 13th. repeated the advice still more insistently and predicted that the "enormous surplus" then available "will operate to make a slump market in 1918." All through the early months of 1918 this advice was repeated and repeated until the early part of June when the Committee, suddenly reversing itself, issued a bulletin telling publishers to "buy paper heavily" and to maintain a six months' reserve supply whenever possible—advice that came too late to benefit those publishers who had heeded that given during the preceding six months' period.

Publishers would do well to read over their old files of A.N.P.A. "B" bulletins and to check up the predictions made therein with their own subsequent experience in buying paper. With no desire to cast discredit upon the judgment or good faith of the Paper Committee, it is doubtful if their advice in the present instance is any more sound than that given by the Committee in 1917-18. Publishers who follow it, without looking into conditions for themselves, may have as much cause for regret as did those who followed the committee's advice three years ago. There were numerous newspaper publishers who disregarded the advice of their committee at that time and entered upon firm contracts at the then prevailing prices, very much to their subsequent peace of mind and financial profit. It is quite possible that their experience too, may be repeated. The indications, despite all that is said to the contrary, are for a firmer newsprint market in the near future.

FREIGHT FROM EUROPE LESS THAN BY RAIL.

Chicago, Ill., Nov. 1.—"It costs $2 less to ship a ton of newsprint paper from Germany to New York City than to ship a ton of the same paper from Niagara Falls across the state of New York.

"America's paper industry faces serious competition from foreign lands not alone because of the fact that foreign paper is made by cheap labor, under depreciated exchange conditions, but also of the cost of freight shipments."

These were two notable statements in a discussion of paper importations by R. S. Kellogg, Secretary of the News Print Service Bureau, before the Salesmen's Association of the Paper Industry, at the convention of that Association this morning. He then went on to give figures showing comparative freights between foreign shipping points and American points, as evidence of the conditions confronting the paper industry in general.

The rate from Hamburg to New York and other Eastern ports is $4 per 1,000 kilos or $3.64 per ton of 2,000 pounds, and $6 per long ton or $5.36 per 2,000 pounds from Scandinavia. Compared with this are rates from various important American mills. The rate from Watertown and Glens Falls to New York is $5.60 and from Niagara Falls, $5.70. The Watertown rate to Philadelphia and Baltimore is $6.30. Typical rates from important Canadian shipping points to New York are: Espanola, Ont., $10.50; Grand'Mere, Que., $7.50; Iroquois Falls, Ont., $9.60; Jonquiere, Que., $8.60; Ottawa, Ontario, $7.60; Sault Ste. Marie, Ont., $10.50; Three Rivers, Que., $7.60. Maine-New York City rates are not much better than the Canadian, the Livermore Falls rate being $6.40 and the Millinocket Rate $7.70. From Port Edwards, Wis., to New York City is $11.30; to Philadelphia $10.90, and to Baltimore $10.70.

"America, even with the best, fastest and most modern paper mills in the world," said Mr. Kellogg, "cannot successfully compete with the prices of European paper made and shipped under these conditions. It is the publishers who will suffer in the long run, for American mills cannot make paper to meet present European prices, and Europe cannot supply America's permanent needs. The normal result would be wide swings in prices which are always disadvantageous to producer and purchaser alike in any commodity where price extremes are found."

"It is better for the American user of newsprint to have a dependable source of supply at home at a price which affords a reasonable profit to the manufacturer and thus encourage greater production than to have a temporary supply from abroad at prices fixed by ruinous unfair competition, which will vanish when world conditions again approach normal."

COST ASSOCIATION OFFICERS.

The Cost Association of the Paper Industry held its sixth semi-annual convention, Thursday and Friday, October 6 and 7, at the Drake Hotel, Chicago. The meeting came to a successful conclusion Friday night, after the banquet.

While there were speakers who attended during the two days' meetings, who in their addresses brought in other topics, the convention was given over almost entirely to the subject of cost systems which are used in the industry, and how these could be perfected.

Starting with the first session, everyone attending was busy learning or teaching. The first session was one of business. The president delivered an address of welcome, the secretary made his semi-annual report, matters of general business of the organization were taken up and then followed the election of officers for the period from October, 1921, to October, 1922.

Election of Officers.

The new officers are as follows:

President, Seth L. Bush, manager of research, Crocker-McElwain Company, Chemical Paper Manufacturing Company, Holyoke, Mass.

First vice-president, Dr. R. E. Rindfusz, secretary, American Writing Paper Company, Holyoke, Mass.

Second vice-president, Jacob Kindleberger, president Kalamazoo Vegetable Parchment Paper Co., Kalamazoo, Mich.

Third vice-president, C. A. Jasperson, secretary, Nekoosa-Erwards Company, Nekoosa, Wis.

Fourth vice-president, John Schmidt, of Schmidt & Ault Paper Company, York, Pa.

Executive Committee.—S. L. Bush, re-elected president; R. E. Rindfusz, first vice-president; B. A. Franklin, vice-president of the Strathmore Paper Company; Jas. A. Reilly, American Writing Paper Company, and H. R. Weaver of the International Paper Company.

TRADE ASSOCIATION VITAL TO BUSINESS PROGRESS.

Chicago, Ill., Oct. 26.—"The trust is imperialism. The trade association is democracy. Any organization which assumes the dominating, monopolistic, dictatorial attitude of imperialism, whether that organization is of business, labor or politics will fall as surely as imperialistic houses of Europe have fallen before the onward sweep of political democracy," said O. B. Towne, secretary of the Waxed Paper Manufacturers' Association, in discussing the Philosophy of the Trade Association before the National Convention of the Association Trade Executives at its opening session today. "Imperialism in business is economically unsound. It therefore cannot survive, for the principle of economics is eternally operative. It recognizes no time, no political boundaries, no nationality, no latitude or longitude, no race or creed. It is the same in substance as it has always been and will always be.

In the earliest days men gathered together when faced by danger, for protection against disaster. But as soon as such groups of men became aggressive, and compelled tribute they fell. That which is economically unsound undermines itself and falls.

"The American business man today is no longer a citizen of American only, but his citizenship is of the world. His business is no longer confined within the nation's boundaries, but is world-wide. And to meet the competition of the world, the brightest minds of every industry must group to give to each the experience of all. That is the trade association.

"The trade association, like all other orgnizations, has three fields, one of which is fatal to itself. The trade association is a group of men in a similar business activity associated together for protection against common evils, and for the development of processes and methods, improvement of manufacturing or distributing processes. The moment the trade association goes into the aggressive field, to demand tribute, the economic law begins to work, and the association cannot survive. Today, the American government has recognized this to the extent that law compels the trade association to remain within its two legitimate fields, and to prevent its own suicide through improper activities. The trust is imperialistic when it desregards responsibility. The association is the democracy of industry because it has group purpose, group effort and group responsibility and the principle of the greatest good to the greatest number."

Technical Section

REVIEW OF RECENT LITERATURE.

A-1. Boabab Fiber. World's Paper Trade Review, lxxvi, 4, July 22, 1921. A British patent has been granted to ABRAHAM WOOD, Lower Broughton Manchester, and GEORGE RUSSELL, Higher Broughton, on an apparatus for keeping the breast roll in the same relative position to the endless wire which passes over it no matter what the extent of the shaking motion is, so that a much better sheet of paper is made than is possible under the present conditions.—A. C.

A-1. Determining the Moisture in Wood. Paper Industry, ii, 3 (June, 1921). A description of a method used by the Forest Products Laboratory for the determining of moisture in wood. This method involves the use of coal oil, requires little equipment and but a few moments of time.—A. C.

A-6. Testing Coal. E. C. MILHAM, **Paper Industry,** ii, 3 (June, 1921). A description of the methods used in making tests for determining the value of coal before it is burned.—A. C.

A-7. Sulphur and Pyrites in Finland. World's Paper Trade Review, lxxv, 25, p. 2250, June 24, 1921. After lying forgotten or unexploited since early in the eighteenth century, valuable sulphur ore deposits were rediscovered in the fall of 1918 at Otravaara, in the Eno district of eastern Finland.—A. C.

B-4. Pulp from Veneer. World's Paper Trade Review, lxxv, 24, June 17, 1921. In the wood waste from veneer factories the United States Forest Products Laboratory sees considerable raw material suitable for the manufacture of high grade of paper. The cores of many kinds of veneer logs, now used in large part for fuel, would make excellent pulpwood. In addition a large part of the clippings and small veneer waste, which amounts to one-fifth of the total veneer cut, probably could be turned into pulp stock with profit. —A. C.

B-0; C-0. Relation of Moisture to Decay of Wood. WALTER H. SNELL, **Paper Industry,** iii, 2, May, 1921. An article relating what is thus far known regarding air and moisture relations of fungi which decay wood. The writer's experiment with five different fungi, four of which occur on pulpwood, shows that 60 per cent of water in the logs will eliminate all danger of serious loss from decay. A constant spray or "artificial fog" will keep the logs sufficiently wet to protect them from both fire and decay. Logs so wet will mould on the outside, but moulds do not damage wood beyond discoloring it superficially.—A. C.

E-5. Preliminary Impregnation in Cooking Sulphite. VANCE P. EDWARDES, **Paper Industry,** iii, 2 (May, 1921). Results of experiments show a way of reducing the cooking time in the sulphite process without injuring the quality of the pulp. A. C.

K-12. New Drying Arrangement. World's Paper Trade Review, lxxvi, 5, July 29, 1921. An object of an invention by FRANK P. MILLER is to reduce the ground area usually required by a papermaking machine, and this is accomplished by placing the drying cylinders on a floor, specially constructed above that on which are making mechanism and the calendering rolls and cutters. It has been found by the arrangement described that there can be saved about 50 per cent in the length of the building and that the paper can be protected while it is being formed, as well as the finished paper, from moisture from the dryers, and that the moisture can be carried off as soon as formed.—A. C.

K-22. Cigarette Paper from Sulphite Pulp. World's Paper Trade Review, lxxv, 25, July 29, 1921. According to **Papier Zeitung,** a patent has been granted to the Mannheim Waldhof Company for the manufacture of cigarette paper from sulphite cellulose. Hitherto it has been impossible to employ this form of pulp for cigarette paper.—A. C.

N-4. Improving Boiler Room Practice. ROBERT JUNE, **Paper Industry,** iii, 4 (July, 1921). The use of cheaper coal, elimination of smoke and reduction of labor through better methods of combustion.—A. C.

N-0. Power Plant Management. ROBERT JUNE, **Paper Inlustry,** iii, 2 (May, 1921). An article describing a bonus system for boiler room employees.—A. C.

P-4. First Aid to Injured. FRED. M. ROSSELAND, **Paper Industry,** iii, 4 (July, 1921). Purposes of first aid, means of preventing infection, the kit, teams and cabinets and the training of employees to give first aid.—A. C.

R-1. Papermaking in India. World's Paper Trade Review, lxxv, 24, June 17, 1921. L. S. SUBRAMANIYA, Aiyar, B.A., in the course of a plea for more paper mills in India, which he makes in the **Business World** published in Madras, refers to the efforts in western countries to provide new raw materials and contracts with the dearth elsewhere to wealth of forest lands in India. Reference is also made to the exploitation of bamboo in Trinidad.—A. C.

R-7. Handling the Employment Problem. F. H. ROSEBUSH, **Paper Industry,** iii, 4 (July, 1921). An illustration of how the employment work is handled at the Nekoosa-Edwards Paper Company.—A. C.

R-12. Paper Pulp. World's Paper Trade Review, lxxvi, 2, July 8, 1921, p. 146. India's resources in relation to the British market.—A. C.

R-0. Dearer Postage. Paper Making, xl, 6, June, 1921. The government, in order to make up for losses on the telegraph and telephone srevices, proposes to burden heavily the postal service which even the government cannot afford to run at a loss. This is forcing merchants and British publishers to print elsewhere. British circulars sent out wholesale will be printed in Holland on Dutch or German paper and posted in Germany, or, at any rate, abroad.—A. C.

Why beholdest thou the cigarette that is in thy son's mouth, and considerest not the cigar that is in thine own mouth? Or wilt thou say to thy son, "Let me pull out the cigarette out of thy mouth," and behold a cigar is in thine own mouth? Thou hypocrite! First cast out the cigar out of thine own mouth, and then shalt thou be prepared to cast out the cigarette out of thy son's mouth (or thy daughter's).—"The Missionary World."

PAPER MILLS REDUCE WINTER CUT OF WOOD.

Chicago, Ill., Nov. 2.—Heavy reductions in woods operations by the paper and pulp manufacturers of the United States were reported at the convention today of the Woodlands Section of the American Paper and Pulp Association when Secretary O. M. Porter gave the results of a survey of wood on hand and projected operations.

There will be no immediate shortage of raw material for the reports indicate that there is still a large quantity of pulpwood in the hands of the manufacturers, even though this was put in at prices far above the presumptive cost of woods operations during the coming winter.

"Reports from forty-eight companies, "said Secretary Porter, "are sufficiently distributed to provide probably an accurate estimate of the whole situation, seventeen being from New York, nineteen from the lake states, six from New England, three from Pennsylvania and three from the west."

The 1920 consumption of pulp wood by these mills was 1,855,005 cords and their stocks on hand on September 1 was 2,292,483 cords. Pulp manufacturers usually carry two years stock of wood on hand, but this year are putting in only 792,630 cords. In view of the reduced operations in mills of the entire country, the total now on hand or contracted for of over 3,000,000 cords, normally only enough for 20 months, will be practically a two years supply, indicating no shortage the coming year. The small input this year, however, less than one half of last year's consumption, portends extremely low stocks in the fall of 1922.

"These figures", says Secretary Porter in his conclusion, "reflect very clearly the present pulpwood market situation. American mills are overstocked with high priced wood, and are curtailing their logging operations, in many cases from 50 to 70 per cent of the 1920 operations. Of the 87 mills making reports, 27 reported they were making no contracts for any wood this winter."

ASSOCIATION OFFICER PLEADS FOR TRADE JOURNALS.

New York, Oct. 3.—The relation of the trade association to the trade journal, as well as the possibility of close cooperation by the trade association with the house organs published by individual members of the particular industry involved formed the subject of extensive discussion at the monthly meeting of trade secretaries of New York on Tuesday, October 18th.

The speaker of the day was Dr. Hugh P. Baker, executive secretary of the American Paper and Pulp Association, who struck what seemed to be the keynote of the day, in his declaration that the trade association should endeavor to cooperate with the trade journals of his industry.

"The official publication of a trade association, its bulletin or magazine or whatever form its published material may take, should never be of a nature to place the association publication in competition with the trade journal", said Dr. Baker. "The trade journal has a vital field in industry, just as well-defined and as helpful to the industry as the trade association. To cooperate with the trade journal, and not to publish a journal in opposition should be the aim of the trade association secretary.

"Particularly, I believe, is this true of the question of advertising. I doubt if the solicitation of advertising by an association publication is right or proper. In most cases it is too close to the use of the big stick against those dealing in supplies for the industry, and might easily be unfair competition with the trade journal which means so much to the business man.

"In the American Paper and Pulp Association, care is exercised to maintain most harmonious relations with the trade journals. They are provided with all of the material published in the Association bulletin to its members, either simultaneously or in advance of its publication by the association publication. The bulletin of the association acts as an auxiliary to the trade journal to take merely official announcements of the industry to its members."

PRESIDENT OF TRADE EXECUTIVES SCORES ILLEGAL ASSOCIATIONS.

Chicago, Ill., Oct. 26.—"First among the standards of the Trade Executive should, I believe, be absolute open cooperation on the part of our respective associations with the United States Government and with the public at large, and personally I approve Mr. Hoover's suggestion of open information," said President Emmet Hay Naylor of the American Trade Association Executives, in opening the annual convention today. Mr. Naylor, who is secretary of the associations of fine paper manufacturers, and one of the best known secretaries whose organizations are federated in the American Paper and Pulp Association, continued:

"By reporting definite representative information to the Government the association will be strengthened, and benefit will come not only to the industry, but to our national industrial stability through a clear, frank understanding of facts. If the reports of an association are carefully and accurately compiled, they can only benefit the industry and the members of the Association by being made public. If they misrepresent and hurt the industry, it is because the Trade Association has not accurately compiled and presented the facts. The elimination of mushroom, illegal trade associations is absolutely necessary not only for the good of the public, but for the good of our profession as a trade association.

"I cannot resist very forcefully suggesting that if the general facts about business conditions in an industry are to be made public through a Government agency that the Government Agency use the Trade Association which represents that industry as the source of correct information. Otherwise, there would have to be a board of experts at Washington for practically every industry, to do the work in which the existing trade association is a specialist.

THE NEWSPRINT SITUATION.

The abandonment of the threatened railroad strike in the United States has not resulted in cancellations of rush orders for newsprint which Canadian mills received when the strike seemed certain. Most of the mills report that they are filled up with orders for thirty days ahead. In some instances, temporary orders for immediate delivery have been rejected even when there was no question of price involved.

Trade publications this week indicate some revival in the American newspaper publishing business. The Scripps-McRae League, which publishes twenty-five dailies in different cities announces the inauguration of two new papers, one in Washington, D.C. and another in Knoxville, Tenn., and plans for the installation of twenty additional daily papers within the next four years, five to be undertaken in 1922. A large German language daily paper in Chicago, suspended during the war, has resumed publication. A new daily was started in Flint, Mich., November 1st, and one is planned for Seattle, January 1st.

PULP AND PAPER NEWS

The reopening of the Riordon Company's large pulp and sulphite mill at Kipawa not merely indicates an increased demand for the grades of pulp produced there but it also means the affording of employment to a considerable number of men. About 300 and 400 men in the Ottawa district have, it is understood, been taken on by the reopened plant, and this number may be expected to be largely augmented as operations at the Kipawa mill develop.

Gratifying reports are coming to hand respecting production at the Spanish River plants. These are understood to be operating at full capacity.

The receiver for the Mattagami Pulp and Paper Company, Ltd., has sent to the bond and debenture holders of the Company a letter reviewing the Company's position at the present time, and stating that interest charges maturing on bonds and debentures on Tuesday of this week will be deferred. The Company is reported to have received orders for pulp at prices which pay operating charges, but do not afford a profit. The sale of the product in this way is permitting the working off of inventories, and, it is stated in the letter referred to, will bring about either a reduction in the banking liabilities of the Company or the substitution of lower priced materials for those on hand. A statement of assets and liabilities will be issued shortly. The Mattagami Company, it may be added, formerly conducted its own camp for cutting operations, but, this year, the work is being done through jobbers. Quite a quantity of pulpwood is being taken out.

The printers' strike in Toronto is still in process. There have, the last week or two, been rumors afloat, which profess to be well authenticated, to the effect that a settlement may be brought about this week or next. But as similar rumors have been rife about every three or four weeks since the inception of the strike, it is not safe to attach any special credence to these latest. That the strike has been a serious impediment to the paper business, just at a time when that business could least afford to be hampered and hindered by any such thing, is, of course, beyond dispute. But considerations of that kind will, as events have shown, play little, if any, part in bringing about a settlement, if a settlement comes about, it will be rather because of pecuniary difficulties experienced by one side or the other—and possibly by both—in continuing longer.

A very favorable impression has been created in pulp and paper circles generally by the figures presented by Hon. T. W. McGarry, president of the Whalen Pulp and Paper Company, Ltd., at the recent annual meeting of that Company. The Company appears, from the figures in question, to have enjoyed a very successful year. The physical condition of the concern was stated to be in excellent shape, and it was also reported that the sum of $858,735 had been expended on capital improvements. But Mr. McGarry added that no further capital expenditure would be incurred unless essential to the prosperity of the industry. The Company's production of pulp, last year, was 51,731 tons—an increase of nearly 4,000 tons over that of the previous year.

The Ontario Timber Commission, which first commenced its enquiries more than a year ago, has been sitting for the last three weeks in Toronto after an adjournment of some months. The public are displaying considerable interest in some of the evidence which is being produced before that body—notably in the evidence to the effect that certain tenders were withdrawn for pecuniary considerations.

Paper Trade Meeting.

Beyond a brief notice of the satisfactory character of the attendance, and the importance of the subjects discussed, at the fourth annual convention of the Canadian Paper Trade Association, held at the Windsor Hotel, Montreal, an account of the proceedings thereat has not appeared in these colums. It may therefore be well to give a brief resumé of the proceedings. The Convention was held on the 12th and 13th of last month and throughout was marked by a gratifying spirit of optimism as regards the future of the trade. The attendance included representatives of leading paper firms all over Canada.

In this review of the work of the year, Mr. C. W. Graham, president of the Association, emphasized the value of the organization, in a period of considerable strain, in preventing disaster by its insistence on the advisability of a conservative policy. He pointed with some pride to the fact that few orders from paper dealers to manufacturers had been cancelled, although taking delivery meant almost certain loss to the buyer. As he rightly said, it is remarkable that, with heavy liabilities, huge stocks, and small demand, there was no dumping of goods on the market at slaughter prices, but, instead, an adherence to a wise policy—in this connection he paid a high tribute to the members of the Canadian Pulp and Paper Association for their co-operation—which made it possible for the undertaking confined in the organization to be brought through a turbulent period with a minimum of loss. Losses, he added, had, in most cases, been met out of reserves which wise dealers had set aside for the purpose, and which are of sufficient size to take care of any possible further reductions. Of the many matters brought under the consideration of the Association during the year, one of the most important was the application for more equitable treatment by the mills, by an increase in the number of lines which the manufacturers are desirous of distributing through the paper dealers, or a fair basis. He added that the Association is still working with the Canadian Pulp and Paper Association to improve conditions and to remedy some inequalities which have grown up from time to time.

The treasurer of the Association, Mr. E. S. Munroe, presented a satisfactory financial report, and the secretary Mr. N. L. Martin, in his report, stated that the work of the Association in the past year had been more active than in any preceding year, and that the membership comprised every fine paper maker in Canada, with one exception. Mr. Martin laid stress on the fact that, while, in some lines of business, efforts to get

orders and a glut of merchandise, has created conditions approaching demoralization, the cordial understanding between the paper mills and the merchants, fostered by the existence of their respective organizations, had prevented any such collapse in the paper trade.

Among the papers read at the Convention was one by Mr. A. Clarke Hunt, manager of the John Martin Paper Company, of Winnipeg, on the timely subject of "Knowing Costs in Paper Merchandizing." The mill organization was represented by Mr. A. L. Dawe, secretary of the Canadian Pulp and Paper Association, and a number of its members. The officers for the coming year were elected as follows: Mr. C. F. Kay, of Vancouver, president; Mr. George Wilson, of Winnipeg, 1st vice-president; Mr. J. F. Larkin, of Montreal, 2nd vice-president; Mr. E. S. Munroe, of Toronto, treasurer; and Mr. N. L. Martin, of Toronto, secretary.

LOWER STUMPAGE RATES IN B. C.

St. John, N.B., Oct. 25.—At a meeting of the provincial Government here this afternoon, special stumpage rates of $4 per 1,000 feet on spruce and $2 per thousand feet on fir cut on Crown lands, were fixed. Premier Foster presided.

A memorandum from Colonel Loggie, deputy minister of lands and mines, in regard to the order-in-council passed at a previous meeting providing for an allowance to lumbermen for cutting budworm-killed and burnt over timber, was received and considered. Under this order-in-council the rate on this class of lumber was fixed at one-half the regular rate. Owing to the difficulty of having the lands examined in time for this year's operations, it was recommended, as a result of a careful investigation which had been made by the Forestry Department, that a flat rate be put into force of $4 per thousand for spruce and $2 per thousand for fir, with the proviso that this rate would only apply in cases where an effort was being made to save the dead timber, and where the cut of dead fir amounted to forty per cent. of the whole operation in that district.

This action by the Government will enable the lumbermen to commence operations at once, and it is hoped that it will tend to the saving of timber which would otherwise be lost, and also assist in some degree to relieve the unemployment situation.

The International Paper Company has increased production to 700 tons daily, or close to 60 per cent. Additional mills are expected to be placed in operation shortly. Of the 700 tons now being produced daily, 500 tons are news print. Eleven mills of the company are operating. Officials claim that in the event of a railroad strike operations would not be hampered. The chief item of raw material is wood of which there are ample supplies at the mills.

Evening classes are being organized at Bathurst, N.B.. Arrangements will be made so that tour workers in the pulp mill will not lose any of the instruction by reason of their work schedule.

An American journal announced a few days ago, that Bagley & Sewall are making four machines for the St. Maurice Paper Co. at Three Rivers. Evidently this is intended to mean the St. Maurice Lumber Co., an "alias" for the International Paper Co. The machines are practically complete and W. D. Carnes has come on from Watertown to supervise their erection.

BOOK REVIEW.

FROM PAPER MILL TO PRESS ROOM. By William Bond Wheelwright. Published by the George Banta Publishing Company, Menasha, Wis. Price $2.00.

When a man inherits a fondness and knack for paper making from his grandfather who entered the business in 1834 and has, in addition to practical experience in paper manufacture, a first hand knowledge of the principal uses of paper, he is in a position to write with authority on the subject chosen for the title of this book. Mr. Wheelwright has told his story in a most interesting way and with an occasional illustration which serves to give the reader a good notion of the principal machines and arrangement in the mill.

The story begins wit a short chapter on the origin and history of paper making and then takes up the subjects of raw materials, future fibre possibilities, and a description of the characters and behavior of the principal constitutents of paper. The paper making process from beaters to the finished paper is briefly covered in two chapters and then we find chapters on the physical and chemical aspects of paper in which special attention is given to those qualities which affect its use in printing. The chapter also on appraising and testing paper is evidently written with the printer in mind as the principal reader. The chapter on pressroom difficulties should prove a particularly valuable one as it is written by a man who understands both sides of what often develops into acrimonious discussion when troubles occur whose origin and correction are understood by only one side or neither.

Following this is an interesting account of the paper trade which explains the principal methods of merchandising paper.

Chapter 12 is no doubt a very interesting one but it is either accidentally omitted or chapter 13 is incorrectly numbered. Perhaps the mistake is intentional in order to give greater emphasis to the concluding pages of the book wherein special attention is drawn "to the importance of a knowledge of printing." This chapter contains so much in the way of valuable suggestion that it is to be printed in full in this magazine at an early date.

A book of this kind is necessarily elementary. It is impossible of course, to cover adequately either the manufacturing or the use or the properties of paper in one hundred pages but with the principal points carefully and concisely stated, there is a great deal of very helpful information in it for both the paper maker and the printer.

The book is printed on Wheelwright's "B.P.F." paper 25 x 38 - 70. It is an excellent piece of printing and we find relatively few typographical errors. The statistics are a bit old as 1916 is the last date mentioned but the references to output are still helpful as regards relative production of the various kinds of paper.

A license for an electro-hydraulic development at Orchard Lake, Alaska, has been obtained from the Federal Power Commission by the Alaskan-American Paper Corporation. The power developed through hydraulic turbines to be installed at a dammed point of the lake will be utilized to operate a pulp and paper mill located at the head of Shrimp Bay. All pulpwood grinding machinery will be directly connected to hydraulic turbines, and all other machinery and appliances in the mill will be electric-power driven.

WHALENS MAY START THIRD MILL.

Toronto Oct. 31.—Whalen Pulp and Paper outlook has improved to the extent that consideration is now being given to the re-opening of the third mill within a month or six weeks. This announcement followed a meeting of the directors here today, the first meeting since the annual held recently at Vancouver. At present the plants at Port Alice and Howe Sound are in operation, the third being at Swanson Bay, about 70 miles south of Prince Rupert. The plant at Howe Sound narrowly escaped destruction on Saturday, being within a mile of the scene of the cloudburst which did so much damage at the Britannia settlement. Word received yesterday indicated that the company's property had entirely escaped injury.



HON. T. W. McGARRY, K. C.,
President, Whalen Pulp and Paper Mill, Ltd., Sulphite Makers, Vancouver.

The directors at their meeting today re-elected Hon. T. W. McGarry president, and made W. D. Ross, who has been a director for some time, vice-president of the company. Mr. McGarry will leave next week on another visit to the company's property and a more definite announcement as to the opening of the Swanson Bay plant will follow At present the company is enjoying a good export business, mainly with Japan, and conditions are said to be steadily improving.

LOOKING UP LABRADOR'S PEDIGREE.

Winnipeg, Oct. 29.—The contention that Newfoundland can have any claim upon Labrador was disputed last night by Bram Thompson, a barrister, of Regina, and editor of the Canadian Law Times.

Mr. Thompson stated that Newfoundland had never been given any rights of ownership to any part of Labrador, but was, "as a matter of administrative expediency given administrative control of the country." He further stated that the whole of Labrador rightly belongs to Quebec.

The question will stortly come up before the Privy Council. Sir Patrick McGarth, a Newfoundland statesman, is at present in the city looking into the archives of the Hudson's Bay Company for information regarding the Labrador boundaries.

MARKET FOR PAPER FELTS IN JAPAN.

By Trade Commissioner A. E. BRYAN, in the Weekly Bulletin.

Yokohama, September 15, 1921.—The largest single business done in paper felts in Japan is by Toyo Shokwai of Tokyo, who are sole agents for the felts made by F. C. Huyck & Sons, Albany, New York. This firm controls the Kenwood Mills Ltd. of Arnprior, Ontario. Of late all these felts have been coming from the Canadian plant, and the writer has seen many cases of these Canadian felts unloaded from C. P. R. ships. Another Japanese firm—the Meishosha Company, Ltd., of Tokyo—represent another United States firm, do considerable business, and have their own representative working with their agents here. There are also three or four English felts represented on this market by various British commission houses, and the bulk of the imports of felts come from English manufacturers, although American felt importations have been on the increase during the last four years.

The felts most in demand, outside of the ordinary groundwood and sulphite felts, are as under: Top and bottom cylinder wet felts; press felts for all grades of boards; press felts for high quality box boards; wet felts and press felts for fourdrinier machines; 1st, 2nd and 3rd press felts for news.

Felts Now Manufactured in Japan.

Of late two Japanese woollen mills have begun the manufacture of felts, but they are practically in the experimental stage, and the writer has heard of no important mills which are using the local product. The larger mills here usually place their orders well ahead of time with their supliers. In few cases do the larger mills buy their own felts direct from the manufacturers abroad, but are generally content with buying from the local agents in Japan of foreign makers. Just at present the mills are working at a reduction of 20 per cent of output, with a corresponding decline in the demand for felts. In 1920 felts were imported to the extent of over 100,000 pounds at a value of yen 395,945, as compared with only 31,122 pounds in 1919 at a value of yen 118,000.

Any Canadian mills wishing business here must send out their own representative to make his goods known to the mills, and to appoint a firm to represent them here. The Department of Trade and Commerce have a list of firms handling paper machinery and supplies as well as a general list of importers of paper pulp, any one of whom would also be interested in other supplies for paper mills.

Particulars regarding the chief mills in Japan, the kind of paper manufactured, their output and the number and size of machines, are on file at the Department of Trade and Commerce, Ottawa, and may be obtained by interested Canadian firms on application to the Director, Commercial Intelligence Service (quoting File No. T.C.-2-110).

ST. GEORGE MILLS RESUME.

St. George, N.B., Oct. 25.—Operations have been resumed at the St. George Pulp and Paper Company's mills, a New York concern, after a shutdown of six weeks, due to low water.

The Metabetchouan Pulp Co. are erecting at Metabetchouan, Lac St. Jean, County Que., a new sulphite mill, sawmill, boarding houses and sheds. The total expenditure will be $750,000.

UNITED STATES NOTES

A group of controlling stockholders of the St. Regis Paper Company, Watertown, New York, have acquired through purchase the common stock holdings of the Hanna Brothers, Carl H. and Mark A. 2nd, in the Hanna Paper Corporation. The latter, grandsons of the late United States Senator Marcus A. Hanna, will retire from active connection with the paper industry in Watertown. They will retain their preferred stock but will dispose of their residences in the Northern New York town and move to Cleveland. Mark A. Hanna, together with Joseph B. Seaman of New York and G. M. Seaman of Chicago, will continue to have places in the directorate of the company. Floyd L. Carlisle, president of the St. Regis, was chosen to head of the Hanna Company for the sale, and the management of the St. Regis will extend over the management of the Hanna company. The purchase gives the St. Regis a total daily production of about 500 tons, of which about 300 is newsprint. It makes the company third in importance as manufacturers of paper in the United States. The sale includes the Norwood and St. Lawrence Railroad.

The Menasha Printing and Carton Company, Menasha, Wis., has paid employees a production bonus totalling $2,400. This represents the first payment under a new bonus plan adopted last July. These bonus payments will be given out quarterly.

The Marinette and Menominee Paper Company has sold $2,000,000 of first closed 7½ per cent gold bonds to a syndicate composed of Spencer Trask & Co., the First Wisconsin Company and Edgar Licker & Co., of Milwaukee. The bonds are gauranteed as to principal and interest by the Continental Bag and Paper Company.

D. R. Mead, former manager of the Peshtigo Pulp and Paper Company, has been absolved by a Wisconsin jury of a charge brought by his former employers that had caused a loss estimated at $100,000 through gross negligence and mismanagement. It was alleged that Mr. Mead had deliberately mismanaged the concern's affairs, and that considerable loss resulted following his resignation. The specific charges against Mr. Mead were that he had negligently declined to take an order for 100 tons of paper from the Seaman Paper Company, that he had sold 36,000 pounds of paper to the Protecto Paper Cup Company for at less than the market price in order to obtain a commission and that he was negligent in the purchase of mill wrappers The trial of the case consumed eight days, but the jury found in favor of the defendant after only forty-five minutes of deliberation.

The dangers of forest denudation and the need of increased timber production were outlined by James W. Toumey, dean of the School of Forestry, Yale University, in an address last Thursday at New Haven. Dean Toumey declared an increasing scarcity of wood ultimately would result in a permanent shrinkage in many industries. "Out of the original 822,000,000 acres of forests in the United States," he said, "The last vestige of virgin forests will disappear in fifty years."

With the view to establishing a paper commodity division in the Bureau of Foreign and Domestic Commerce, officials of the Department of Commerce have been seeking to interest several paper executives to take charge of such a division. As no one has indicated a willingness to take up the work of organizing a special division at this time, it is thought that some arrangement may be worked out placing an expert on paper under the so-called specialties division.

David Hirshfield, New York City Commissioner of Accounts, in a statement to the press last week, charged that the International Paper Company had benefited on the Beaver River, in the Adirondacks, through the canalizing, damming and diversion of waters by the State. The company, Mr. Hirshfield alleged wanted a water course for floating pulp logs all the way from the forests to its mill. It attained its purpose he asserted after getting the New York Legislature and several State Departments to recognize the claim that its water power rights had been damaged through the State's canalizing of an adjacent river. A vigorous denial to the entire charge was issued by P. T. Dodge, president of the International Paper Company, who characterized it as having no justification whatever and no basis in fact. Mr. Dodge in his statement said that the International Paper Company has not now, and never did have any mill or mills on the Beaver River, or any interest direct or indirect in any such mills. He said that the dates and particulars cited by Mr. Hirshfield are inconsistent with matters of record he himself gave out.

In most of the States in the northern part of the country, where a mixed growth of hardwood and of soft wood was native to the soil, there has been a marked change in growth all in the one direction. The hard wood has given way to the soft. Persons who have observed with any thought the appearance of New England landscapes for over fifty years or more are well aware that the hills are now wearing darker robes than they were when the now old men were boys. Everywhere the change appears to be in the same direction, from the deciduous trees to the evergreen; that is, from those of the falling leaf to those that keep their verdure all the year round. Authorities on forestry have remarked the fact that when one species of trees has been removed its place is regularly taken by trees of another kind. This is accounted for by some on the supposition that the soil has become impoverished of elements that supported original growth, and that it is no longer suited to the further production of such forests. While this may be true, in part, the more likely reason ascribed by forestry experts who have been asked their views is that the change in species is due to changing conditions rather than to soil impoverishment.

Scandinavian newsprint contracted for in large amounts by a leading Los Angeles publisher has proved so unsatisfactory that the last lot of 2,000 tons to arrive at San Pedro harbor has been rejected. A previous shipment of approximately the same quantity was found in a damaged condition. The publisher put in a claim for $10,000 on this consignment and, failing to get a settlement, put a libel on the steamship "Asia" which carried the goods.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 29th Oct.—In nearly every line in the paper industry, September was the best month experienced for many moons. And it may confidently be predicted that October will prove to have been a very good deal better, all along the line than September. The improvement in the whole paper situation, which has been chronicled in these columns for several weeks now, continues without any sign of abatement. It is just that quality and calibre of improvement which men of wisdom most desire—after a period of more or less prolonged and acute depression—a gradual and progressive, not a fast and furious, improvement. In nearly all lines, business is betting better from week to week. And, according to wholesalers with whom the writer has talked the betterment exhibits all the hall-marks which predicate a still more pronounced business activity for the opening of next year. Nearly all grades of paper are moving better. Nearly all mills are increasing their output, on a graduated scale, from month to month. Stocks in the hands of consumers and in warehouses alike had been allowed to become abnormally depleted, and among both jobbers and consumers buying, until within the last couple of months or so, had been of a very discouragingly and persistently "hand-to-mouth" kind. Now stocks are being replenished. And when they have been replenished, it appears almost certain (if one has regard to the almost unanimous predictions of men prominent in various departments of the industry) a continuance of improved general conditions in the industry will maintain and expand production and distribution both. Of course, one does not find precisely the same degree or the same kind, of optimism prevailing either among all branches of the trade or among all representatives of the industdustry with whom one discusses the question of conditions. But the writer has yet to meet either a representative manufacturer or a representative wholesaler who does not recognize that conditions, as they exist at this moment, are symptomatic and significant of a substantial recovery—and a recovery of the right stamp—from the depression which marked the first two thirds of the year.

Right here, there is one matter which may be mentioned, as it is one which paper men are constantly emphasizing in talking with the writer. That is what they term the high cost of printing. They point out that, if printing prices were to take a slight journey on the toboggan, the result would pretty speedily be that there would be a distinct increase in paper buying. But it seems to be pretty generally apprehended that, should the striking printers in Toronto and elsewhere get their way, printing prices would not take the desired tumble.

PULPWOOD.—It is now quite certain that, although one or two companies are taking out quite a bit of wood, the present season is going to be one of unusual quietness in logging operations. Yet by reason of the greatly curtailed wages of the men in the woods, pulpwood concerns now have the chance of conducting such operations at a good deal less than half of their cost a year ago. For, in addition to lower wages, they now have the advantage, owing to the limited scope of cutting, hauling and driving operations generally, of commanding far more efficient as well as more abundant help.

PULP.—The pulp market, as a whole continues quiet, though with some symptoms of an increase in demand—and, in some lines, a marked increase. Prices are somewhat variable. The writer was told this week, by a high authority on the whole pulp situation, that the demand for easy bleaching and strong sulphite is still very far from what it should be. This he attributed to the competition from Sweden and Germany which, he said, constituted a very serious handicap to concerns manufacturing these grades. Not until pulp from these foreign sources disappears from the market will pulp conditions on this continent be as they should. However, should the consumption of pulp in Europe experience a revival—as it is anticipated, in some quarters, that it may likely do in the near future—the situation would be altered materially for the better. On the whole, there has been some improvement in market conditions for pulp, and a further improvement is looked for. This applies particularly to the demand for strong bleached which is on the way to what can be described as good. Easy bleaching is about $57 to $60 at the mill; strong sulphite around $60 at the mill. Bleached is in good demand at 4 cents a lb. at the mill.

NEWSPRINT.—The demand for newsprint will be undoubtedly stimulated by the forthcoming Dominion general election. For already there are signs that all the varied literature, which accompanies, and forms part of a Dominion-wide campaign of appeal to the people will make large demands on the newsprint branch of the industry. Thus far, the Government side is the one which appeals to be the best customer. In Toronto, for example, the bill-boards are largely occupied with enormous pictorial posters, al of them, in varied language and design, imparting the information that "Meighen Will Lead Us Through."

FINE PAPERS.—The market for fine papers continues to improve. This improvement is likely to be rapidly accentuated if some buyers get it firmly into their heads that no recession of prices is to be looked for, but that, on the contrary any price-revision is likely to be upward rather than downward.

MANUFACTURING STATIONERY.—The past few weeks have witnessed quite a considerable change for the better in the manufacturing stationery situation. Indications are that from now on there will be considerable activity in this line.

WRAPPING PAPER.—There has been a marked improvement in the demand for wrapping paper of nearly all kinds in the last few weeks and this continues to be maintained. The prospects for kraft are extremely bright.

TOILETS AND TISSUES.—The business in toilets and tissues continues satisfactory with plenty of orders in hand and prospects in sight, so one manufacturer, whose mills are working to capacity, told the writer this week.

WASTE PAPER.—The increased demand for waste paper, which has recently been noted, continues and shows signs of expansion.

NEW YORK MARKETS.

New York, Oct. 29.—(Special Correspondence)—The news that the proposed country-wide railroad strike had been definitely called off was received with much elation by members of the paper trade, and has made for a distinctly firmer market undertone. There is little doubt but that the sagging of demand which paper mills have experienced for their product during the past few days was almost entirely due to the contemplated walkout of railway employes, and now that the danger of a railroad tie-up is past, buying of paper by consumers and jobbers is being resumed in more active fashion. Moreover, indications are that most users of paper will now take up the absorption of supplies where they left off a few days ago in fear that should the strike go into effect shipments from mill centres would be greatly delayed in transit. Sentiment throughout business circles has been all along that the strike would not be instituted, and yet the possibility that it would, cause a large number of consumers and dealers to postpone placing orders for paper, as well as various other manufactured commodities, with mills, thus leading to a general slowing up of business recently.

An apt illustration of the marked improvement in the paper industry of the United States within the past several months is to be had in the report of the Federal Trade Commission for September, which shows that substantially more paper was produced by mills in this country in that month than during any month so far this year. The total production of all grades of paper and paper board in September was 477,826 net tons, which is some 30,000 tons in excess of the August output of 442,519 tons, and which in turn was the record production for any month of 1921, the next nearest month being March, when 440,777 tons were produced. When it is considered that production almost steadily declined from last March on until it went down to 370,424 tons in July, it can be readily appreciated how manufacturing operations have increased during the last two or three months. It is also quite significant that shipments out of mills in September were larger than mills' output, aggregating 489,128 net tons of all grades or 11,202 tons over the production, and that mill stocks underwent a considerable decline during the month, amounting to 262,807 tons at the end of September as compared with 274,009 tons at the beginning of the month. These figures show that paper mills are producing at a much larger rate at present than at anytime this year and that they are not alone shipping out all of the current production but also a good part of their stored stocks.

Newsprint is meeting with a consistent demand, and, as previously noted, consumption is steadily on the rise. Advertising in newspapers is increasing at a very noticeable rate, which means that publishers are necessarily enlarging the size of their papers and thus using more newsprint. Some of the New York newspapers are running in part on foreign paper, but it is becoming nothing unusual for publishers to come into the open market to purchase considerable tonnage to augment their supplies; business in spot shipments of print paper showing improvement almost very day. Circulation of newspapers is increasing, as is usually the case at this time of the year. An interesting statement in this connection made by Stanley Claque, managing director of the Audit Bureau of Circulation, at the annual convention of that organization this week in Chicago, is that American newspapers have gained 100 per cent in circulation and the volume of advertising has increased proportionately within the last seven years. This statement is something for manufacturers of newsprint to ponder over. It means that in the comparatively short space of time of seven years that the consumption of print paper by United States publishers has not doubled but has at least tripled, because along with a 100 per cent increase in circulation is a similar jump in advertising, thus necessitating that publishers print twice as large papers and double the number of copies.

Fine papers are moving in better volume, and most mills are gradually liquidating surplus stocks, which makes for a much stronger technical market condition. Jobbers are buying not alone to fill customers' orders but also to augment their low stocks, and prices on all grades of writing and bond papers evince an upward tendency. In fact, mills in frequent cases are falling back somewhat in deliveries, indicating that they are getting more business than they can immediately cope with. The rise in raw material costs is a factor having considerable to do with quotations on fine papers, and manufacturers are becoming extremely cautious about naming prices on forward deliveries.

Book papers are holding firm in price and are in good demand. There is some mill capacity still to be taken up, but the average book paper mill is today running at a fair rate of full production and is shipping out practically all the paper being made. Machine finished book is bringing around 6.50 cents a pound f.o.b. New York, super a quarter to a half cent above this price, and coated and enameled from 9 cents a pound upwards.

Wrappings are in steady call and quotably firm. Tissues are moving in a regular way and at maintained quotations. Boards are in increasing demand. Plain chip and news boards are finding a ready market among set-up paper box manufacturers, while corrugating and folding box boards not only are moving actively but are repeatedly advancing in price.

GROUND WOOD.—Mechanical wood pulp is in steady demand, and while business shows a slow though consistent growth and prices incline decidedly upward, no market changes of importance have occurred this week. Consumers are buying at around $30 per ton f. o.b. producing plants, with now and then sales reported at several dollars in excess of this figure, and, on the other hand, with consumers situated a far ways off from grinding mills said to be obtaining some supply at under $30. Most producers are gaging their f.o.b. shipping point quotations to figure out between $38 and $40 a ton delivered, and seem to be having no trouble getting these prices.

CHEMICAL PULP.—Inquiry for chemical pulp has broadened somewhat since the railroad strike was declared off, and the market appears to be becoming livelier. Paper manufacturers continue to buy mainly to cover direct requirements, but the fact that consumers in general are in need of larger tonnage of pulp than in a long time obviously makes for improvement in business, while some are also looking ahead far enough to place some orders for forward deliveries.

Foreign pulp show a stiffening tendency, which is commonly the case as winter approaches and shipments through the Baltic Sea are held up. Sales of high grade Swedish kraft pulp have been reported at 3 cents per pound ex the dock New York, which although a bit



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above the prices quoted on the usual run of Scandinavian kraft, tends to strengthen quotations generally on foreign kraft pulp. Some qualities of imported kraft are available down to 2.50 cents ex dock, but a more average market level today is 2.75 cents. Bleached sulphite is moving freely, with domestic and Canadian producers of No. 1 bleached receiving 4.25 cents a pound f.o.b. producing mills, and with importers quoting around 4 cents on the dock for No. 1 pulp. News grade sulphite is steady at from 2.50 cents upward, and easy bleaching sulphite is selling freely at from 3 cents a pound up to 3.25 cents.

RAGS.—Business in papermaking rags has been a little quieter this week, owing to mills holding back in buying pending the outcome of the proposed railway strike, but prices have changed but slightly, if at all. Dealers in New York are as bullishly inclined as formerly and are not pressing matters, asserting that supplies are coming in from collection sources in small amounts and of poor quality. Roofing rags have sold to felt paper mills at 1.25 cents a pound f.o.b. New York for No. 1 packing, and at around 1.15 cents for mixed satinets, while reports from the Middle West say that dealers there have obtained up to 1.50 cents at shipping points for No. 1 roofing stock. Old whites are firm in price, and dealers quote 6.25 cents and more f.o.b. New York for No. 1 repacked and around 5.75 cents for No. 1 miscellaneous whites. Old thirds and blues are held for 2.25 cents at shipping points for repacked material and from 1.50 cents upward for rough thirds. New cuttings of all kinds are firmly quoted, with No. 1 white shirt cuttings held for 10.50 cents per pound and higher.

PAPER STOCK.—Demand for old paper also has sagged to an extent during the past few days, and prices on some grades have eased off slightly, but the equilibrium of the market is well maintained and packers are not rushing to sell goods. On the contrary, most dealers claim to have but light holdings, and are waiting for demand to pick up. Prices named by leading New York concerns range about as follows on the principal grades, f.o.b. this city: No. 1 hard white shavings, 3.90 cents a pound; No. 1 soft white shavings, 3.50 cents; ledger stock, 1.75 cents; heavy books and magazines, 1.55 cents; old No. 1 manilas, 1.10 cents; overissue newspapers, 90 cents a hundred pounds; folded news, 70 cents, and mixed paper, 55 cents.

OLD ROPE AND BAGGING.—Old manila rope is moving freely at a price basis of close to 4.75 cents a pound at dealers' shipping points. Old bagging is firming in tone and is now bringing 90 cents to $1 per hundred pounds for No. 1 scrap bagging, and around 75 cents a hundred for roofing bagging.

DIRECTION OF FIBERS AFFECTS STRENGTH OF FIBER BOXES.

The direction in which the fibers run in fiber-board boxes has been found to have considerable effect upon the serviceability of the boxes. Fiber board does not tear as easily across the grain as with the grain; it may have two or three times as much strength in one direction as in the other, the difference varying with manufacturing conditions. This excess strength may be advantageously used to reinforce the weakest points of the box and so produce a better balanced construction.

The weakest parts of fiber boxes are the scores, or folds forming the edges of the box. It is impossible to have the fibers running perpendicular to every score, but usually they might be made to run perpendicular to the scores which receive the hardest punishment, or which tend to break open first. The location of the scores most liable to failure, of course, varies with the shape of the box and the nature of the contents, and can best be determined by test. The following comments and deductions are for boxes whose depth is less than their width.

In tests at the U.S. Forest Products Laboratory, on fiber boxes, some packed with two dozen No. 2 food cans, and some with four dozen tall-sized milk cans, it was found that the first break nearly always occurred in the horizontal end scores. By making up the boxes so that the fibers ran vertically instead of horizontally in the sides and ends, the first break throughout the length of a horizontal end score was retarded about 85 per cent. Through the same change, the horizontal side scores, which received the next hardest punishment, were strengthened so that the first break never occurred in them.

The gain in strength of the horizontal scores was, of course, accompanied by a weakening of the vertical scores. But since the upright scores do not ordinarily receive as great stress as the horizontal scores, and in these perpendicular tests were not as likely to come in contact with the sharp edges of the cans, they were able to stand a reduction in strength and yet not become the point of first failure.

PINE STAND GROWS 1000 FEET A YEAR.

Two acres of white pine, near Keene, N. H., were sold three or four years ago, before the war prices, for $2,000 on the stump. The total stand was 254 cords, which equals 170,000 board feet, or an average of 85,000 feet per acre. The trees were from 80 to 85 years old; so the per annum growth on each acre was about 1,000 feet and the gross returns about $12.00 per acre per annum.

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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., November 10, 1921. No. 45

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

IN FLANDERS' FIELDS.

In Flanders' fields, the poppies blow
Between the crosses, row on row
That mark our place; and in the sky
The larks, still bravely singing, fly,
Scarce heard amid the guns below.
We are the dead. Short days ago
We lived, felt dawn, saw sunset glow,
Loved and were loved, and now we lie
In Flanders' fields.
Take up our quarrel with the foe!
To you, from failing hands, we throw
The torch. Be yours to lift it high!
If ye break faith with us who die
We shall not sleep, though poppies blow
In Flanders' fields.

LT.-COL. JOHN McCRAE.

France, 1917.

NOVEMBER ELEVENTH.

Remember the sacrifices that made Peace possible.

Pray for the conference that can make Peace permanent.

GET THE CLASSES GOING.

There seems to be a tendency for pulp and paper mill communities to delay the organization of classes until the whole text book, or, at least, the third volume is available. This is a mistake. The men who need the course most are not the men who are ready to begin their study with the actual manufacturing operations, but those who have not had the educational foundation for the logical analysis of a manufacturing problem on the only sound basis of scientific principles and with mathematical, accurate calculation. The two volumes now on sale provide the necessary material for such instruction. And right here a word might be said regarding the character of this material.

The Textbook Committee realised that many of the men who need and want this elementary instruction require careful explanation of apparently unimportant steps in the reasoning which seem a bit childish to a college graduate. It is these obscure steps that so often prove stumbling blocks to the student, and give the teacher a chance to be of service. Furthermore, it was necessary, while preparing the texts, to make them so clear that the man studying at home, without a teacher, can follow and understand the subject by applying himself to the task. Consequently, the Committee engaged the services of a man who, having spent years in the preparation and presentation of material for correspondence instruction to assist in editing the textbooks.

Another feature that had to be provided for is the use of the books for reference purposes. This makes necessary the inclusion of some material that is not strictly of every day use, but which, to be available, should properly be included with the elementary subjects.

The two volumes now complete contain the following subjects: Arithmetic, Elementary Applied Mathematics, How to Read Drawings, Elements of Physics, Elements of Mechanics and Hydraulics, Elementary Electricity and Elements of Chemistry. These books are ready, why not use them?

Winter is coming on, and the long evenings can not be more profitably spent than in study. There are surely from ten to thirty or forty men in every mill towns who could profit by a systematic study of these books. They should be studied systematically, progressing from subject to subject, as progress is made in school. In fact it is school to those who have been excluded from previous educational opportunities. It should be some one's happy duty in each mill to organize such classes and lend a word of encouragement and advice as studies progress.

The complete course in mathematics will probably take two years, giving two evenings a week. Many mill- and laboratory men can doubtless pass a fair examination on the section on Arithmetic and could at once begin in a more advanced class in the Applied Mathematics (mensuration, etc.) In parallel with either, the section How to Read Drawings can be taken up. For those who have completed the Applied Mathematics, or can pass an examination after reviewing it, the section of Physics can be studied. Possibly this could be started in parallel with the second half of the Applications, depending on how much time the men will put on the work at home.

Once these subjects in volume 1 are mastered, the work in volume 2 will go more easily, partly because of the knowledge obtained, but largely from the attitude and habit of study. In fact, this is really the most important benefit of studying—the ability to concentrate mental effort. The men who get ahead are the men who think. It is better to be able to think straight than to know. One can only know from his own or another's experience; a new situation or problem requires thinking, as does progress. But the ability to think requires the study of what is known.

The best that is known about pulp and paper manufacture is embodied—not embalmed—in these books. It is live, friendly, useful material. It breathes of human experience and leads to wider service through the most wonderful product that man has invented. Surely the study of such is worth while. The treatment is purposely broad. To limit it to a mere description of movements

or specification of apparatus would be to make the student a mere machine. The object of the Committee is to make the readers and students broader, better, men.

SCIENCE AT WORK.

The people of Canada may well learn a lesson on the subject of what organized science can do for an industry by pondering the following quotation of Mr. Sidney D. Wells regarding the work of the Forest Products Laboratory at Madison, Wis. Mr. Wells has, himself, made a number of important contributions to our knowledge of pulp and paper making materials and processes. Canada is relatively much more dependent than is the United States on the wood using industries for the country's prosperity and the continued employment of the population. The work in forest products can, however, be largely paralleled by research in connection with minerals, fisheries, agriculture and such industries as are not based on indigenous raw materials, but which must necessarily be maintained in an efficient state of productivity in order that a balance of opportunities for employment of our whole population be afforded, and in order that local requirements shall not be entirely dependent on imported goods.

"The Forest Products Laboratory is at Madison," said Mr. Wells, speaking before the North-Western Section of the American Pulp and Paper Mill Superintendents' Association, "to serve your needs and as the margin between the cost of raw material and price of finished product becomes narrower the only alternative is to produce more product with the same or smaller amounts of raw material. This will involve painstaking work in studying where losses occur and how they may be avoided, and the superintendent with the responsibility of maximum production and the highest quality consistent therewith cannot devote his attention to these details without the danger of curtailment of production.

"The logical method of doing this is by delegating it to an organization such as ours whose object is to perform this particular function. An example of some work we have done along this line is the studies on the cause and prevention of decay in wood and pulp which was started through Dr. Kress's efforts, carried on with the support of the paper manufacturers, and encouraged by your sympathy. The work has led to what we believe are some very effective methods for reducing the loss. Another study much less in magnitude but of considerable interest and importance is that of the losses on the paper machine. I recently had an opportunity of studying such losses on one of the book and news machines of a mill in a neighboring state. In times past if 30 per cent of the material added to the beater ran down the river it did not cause very much worry because pulp was cheap. In fact, few attempts were made to ascertain where the loss occurred or what it was. The situation is now considerably different and the manager of the mill referred to wanted to know. I was there two weeks and measured the volume of water being wasted from the paper machine, the amount of fiber, clay, and soluble material therein and such other points as were related to the problem throughout a period of eight operating days. The figures obtained were very interesting and I shall give them briefly:

Fiber	tons	In paper	To sewer Insol.	To sewer Sol.	Unaccounted for
Sulphite	45				
Book Stock	41				
Shavings	18½				
Groundwood	200				
	304½	254	38½	6	6
Clay	41	27	14	..	..
Alum size silicate	10¼	4	½	7	1
	356	285	53	13	7

"It was found that even the fact that measurements were being made seemed to reduce the amount of loss and as a result of the study changes are being made which will effect very material savings. As I have intimated, the first step towards reduction of loss is to find out where it is and how much. It is then easy to convince those directly in charge of operation and also the powers that be that possible inconvenience and a certain amount of expense is worth while.

"I have given a couple of instances to illustrate how our laboratory can serve and could give you many more. We are glad of the opportunity to serve wherever possible and also welcome and need your advice to keep us informed of the most vital problems and the benefits of your experience that we may always work within the realms of practicability. I trust we can continue to count on your co-operation with which I am sure we can render a great service."

Canada has a similar institution. It can best serve by having continued interest on the part of wood using industries, and adequate support from the Government.

COBWEBS.

There is a good suggestion in the notes from our London correspondent to the effect that the Pulp and Paper Association should make a collection of literature and specimens of historic and scientific interest to the Canadian industry. There is an excellent collection of specimens at the Forest Products Laboratories in Montreal. In large part this has been made possible by the co-operation of the Association and the various mills. More could be done, no doubt, in regard to the literature and the Association could well assist such a movement.

No one can make a fool of you unless you supply the material.

A particularly good workman always seems to have a particularly good job.

"The best time to hold on is when you reach the point where the average fellow would quit."

Oat Hulls for Straw Board and Paper Pulp*

By S. D. Wells, Engineer in Forest Products, Forest Products Laboratory, Madison, Wis.

Introduction.

In the preparation of oats for oat meal, rolled oats, and other cereal products it is necessary to remove the outer shell or hull. The meat or groat of the oat is then carried on to the next step but the hull is largely a waste product and it has only been found possible to utilize but a small part of the quantity available as roughage in prepared feeds and similar products. Large amounts have been used for fuel with rather unsatisfactory results. The tonnage of oat hulls that must be disposed of is considerable and has been estimated by persons acquainted with the situation to amount to over 1500 tons daily. Of this amount certain mills contribute a very large portion amounting in certain instances to over 200 tons daily. In considering means for the utilization of this material the paper industry offers a most promising outlet, especially when it is considered that the problem of collection has already been taken care of by the miller, and the Forest Products Laboratory undertook a series of paper making studies on the material early in the year with the financial assistance of the Quaker Oats Company.

Raw Materials.

The material worked on consisted of the oat hulls removed from the groat by a special milling process which has practically no grinding action. Some were obtained without any additional treatment while a portion of the material was screened to remove dust, particles of the fine filaments from the groat, and other material obtained in the process. Screening the material is advisable on account of the food value of the fine material removed, its utter worthlessness for paper making purposes, and the trouble occasioned in washing the cooked hulls later on in the process if much fine material is present. Ground oat hulls were also tried but found to be entirely unsuitable on account of the difficulty of obtaining uniform circulation of the cooking liquors during digestion and in the subsequent washing of the pulp.

Cooking Tests.

Rotary autoclaves heated with burners were used in the preliminary cooks. The larger cooks, however, were made in the tumbling digester used for alkaline cooks which has a capacity of from 75 lbs to 100 lbs. of oat hulls. The following cooking processes or liquors were used:

Lime (60% CaO—40% MgO).
Lime (over 95% CoO)
Lime—sulphur
"Sulphate" (Caustic soda and sodium sulphide).

Local Wisconsin lime was used for the first series of lime cooks comprising cooks 1, 2, 4, 5, 6, 7, 8, 9, 10 and 11. This lime is "Dolomitic" in character and contained two parts of magnesium oxide for every three parts of calcium oxide. The magnesium oxide present was believed to be inert and a high calcium chemical lime, such as is used in causticizing and cooking rags or straw was used for cooks 12, 13, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25 and 26. This lime tested over 98 per cent CaO and was found to be from 20 to 30 per cent more active than the Wisconsin lime.

The lime sulphur cook was suggested by the Drewsen patents and was made by using a mixture of quick lime and sulphur. The results were very unsatisfactory and the work was confined to one autoclave cook.

The sulphate process was tried in making cooks 3, 14, 17, 24 and 27, in which a total of 12 per cent of caustic soda and sodium sulphide per 100 pounds of hulls was found to be sufficient to reduce the material to a bleached pulp. The fibres were extremely fine and short and great difficulty was experienced in washing the pulp on account of its slimey water-holding qualities. After the alkali was washed out, however, it resembled the imported straw pulps and could be used for the same purposes.

Cook 17 was tried to determine the character of the pulp obtained under mild cooking conditions. A high yield of 55 per cent was obtained but the pulp was unevenly cooked and unsuitable for bleaching. Difficulty was also experienced in washing. Two cooks were made in which the straw was mixed with cotton linters with the object of counteracting the extreme softness and fluffiness of cotton linters with the hard dense nature of the straw pulp. Cook 24 was made using 46 pounds of oat hulls and 31.9 pounds of second cut cotton linters and a yield of 63 per cent was obtained. The grade of cotton linters used would give a yield of about 80 per cent under the cooking conditions leaving a yield of 51 per cent for the oat hulls. Cook 27 was made using 74 pounds of oat hulls and 27.5 pounds of cotton hull fibre obtained by the Segundo process of delinting the cotton seed. A yield of 58.3 per cent was obtained. Segundo fibre cooked under the conditions would give a yield of 75 per cent leaving a yield of 52 per cent for the oat hulls. The products obtained bleached very readily. Eight per cent of bleaching powder was used to bleach cook 24 and 5 per cent with cook 27. The softness of the cotton fibre in the mixture made it possible to wash without difficulty and it seems probable that an outlet for the material might be found in the manufacture of book, magazine and similar papers. The cooking conditions in greater detail are given in Table I.

Paper Making Tests.

The material obtained from the various cooks was washed and beaten to what was thought to be the proper amount and then run over the combination cylinder-fourdrinier paper machine. The furnishes of the various runs are indicated in Table II. In general the lime cooks were washed one hour in the beaters and then brushed lightly for a second hour. When run over the paper machine the stock was passed through a Jordan which gave it a stiff brushing and by varying the degree to which the plug was screwed a considerable variation in the fineness of the stock was obtained. In the runs in which the cylinder machine was used it was found that the stock tended to settle in the bottom of the cylinder vat. This trouble was remedied, however, by placing a small shower pipe in the vat and with a small amount of water sufficient agitation was secured to prevent settling. Cooks 6 to 22 were run over the cylinder portion of the paper machine while cooks 23 to to 26, inclusive, were run over the Fourdrinier por-

* A comprehensive discussion on the Structure of Cereal Straws, by Prof, F. E. Lloyd, began in the Pulp & Paper Magazine, Sept. 15, 1921. Reprints are 25 cents each.

TABLE I.

Cook No.	Fibrous material charged (B.D.W.)			Chemical used per 100 lbs. material			Volume cooking liquor per 100 lbs.	Alkali consumed ratio of combined to total	Temperature	Maximum steam pressure	Pressure attainment period	Maximum pressure maintained	Yield.
	Oat hulls	Straw	Cotton linters	Lime	NaOH	Na_2S							
	Pounds	Pounds	Pounds	Lbs.	Lbs.	Lbs.	Gals.	%	°C	#/sq.in	Minutes	Minutes	%
3	2.4	--	--	--	9.2	10.9	40	--	160	75	120	145	25
14	75.0	--	--	--	11.25	3.75	50	--	144	44	90	300	--
17	76.0	--	--	--	8.9	2.96	50	83.5	135	31	120	320	55.3
24	46.0	--	31.9	--	9.0	3.0	50	81.4	135	31	105	390	63.0
27	74.0	--	27.5	--	9.0	3.0	30	86.7	140	38	300	1035	58.3
2	2.35	--	--	16.0	CaO 60% MgO 40%	Sulphur 31.9	48.8	--	150	54	210	210	53.6
1	2.63			15.0	"	--	47.5	--	150	54	195	240	53.7
4	2.00			15.0	"	--	53.4	--	135	31	120	135	65.7
5	2.00			15.0	"	--	53.4	--	134	29	135	120	
6	84.0			15.0	"	--	50.0	--	136	32	120	225	
7	81.5			15.0	"	--	50.	--	135	31	90	315	
8	86.2	Ground hulls		15.0	"	--	50.	--	135	31	120	330	
9	79.0			15.0	"	--	50	--	136	35	90	360	
10	80.0			12.8	"	--	50	--	135	31	60	360	
11	77.5			10.0	"	--	50	--	135	31	90	420	
12	82.5			10.5	High calcium lime		50	--	135	31	60	420	
13	79.0			7.5	" "	"	50	--	135	31	45	420	
15	75.3			12.5	" "	"	50.3	--	136	32	70	480	
16	76.0	Screened hulls		12.5	" "	"	50	--	138	35	45	480	
18	67.4			12.5	" "	"	50	--	135	31	120	480	
19	75.0			10.6	" "	"	50	--	135	31	120	480	
20	47.0			10.6	" "	"	50	--	135	31	120	480	
21	64.0			12.5	" "	"	50	--	160	75	105	240	
22	70.0			12.5	" "	"	50	--	118	12	120	144	
23	69.0		5.0	12.5	" "	"	50	--	135	31	120	480	
25	15.4		2.6	11.8	" "	"	48	--	135	31	120	480	
26	78.4		6.3	11.6	" "	"	50	--	136	32	150	480	

Note: Beginning with Cook No. 12, yields were not determined on account of presence of considerable lime residue in pulp from blow pit. Indications point to 70 per cent as a fair average.

tion. Considerable difficulty was experienced in running the sheet on account of the fact that the machine was not equipped to run straw board and it was found necessary to add 10 per cent of sulphate or kraft pulp to the furnish to be able to run over the machine. Cooks 7, 8, 9, 10, 11, 12, 13, 15, 16 and 21, were run with 10 per cent kraft pulp. In the cook 20 old newspapers were used instead of kraft and in the same proportion. The sheet, however, was unsatisfatcory. In cooks 18, 19 and 22, 10 per cent raw second cut cotton linters were used with promising results and in cooks 23, 25 and 26, 7 per cent second cut cotton linters were mixed with the hulls before cooking and given the same treatment with the result that the linters were hardened and a stronger sheet was obtained than with the raw linters. The appearance of the sheets obtained are indicated in Table II in the column headed "Condition of Sheet."

Strength Tests.

Strength tests on the more promising sheets obtained are given in Table III. The results obtained indicate that the greatest factor to be considered in utilizing oat hulls for board is the beater treatment. The optimum cooking conditions seems to be between 11.6 and 12.5 per cent of CaO with a temperature of not over 136 degrees C for at least six hours. There were numerous cooks made under these conditions, however, which were weak and unsatisfactory on account of unfavorable beater treatment.

The run made from cooks 25 and 26 showed the maximum strength. The furnish of this run when analyzed consisted of 65 per cent oat hull pulp, 25 rye straw pulp and 10 per cent cotton linter pulp. The straw blended well with the oat hulls and seemed to give results superior to what can be obtained from either adone.

Corrugating Tests.

The sheets obtained in the trial runs indicated that satisfactory results could be expected in using oat hulls to replace straw either partially or wholly in the manufacture of straw board. Samples were corrugated by the Mid-West Box Company and the American Can Company and while they did not possess all the stiffness of the regular stock the conditions under which they were run through the corrugating machines was not equally advantageous and the opinion seemed to be general that it was only a matter of adjusting a few

TABLE II.

Cook No.	Stock from digester.			Stock added.				Condition of beaten stock	Condition of sheet
	Oat hull	Rye Straw	Cotton linters	Kraft	Sulphite	Old paper	Raw cotton linter		
	%	%	%	%	%	%	%		
17	90	--	--	--	10	--	--	Slow	Shivey
24	48	--	52	--	--	--	--	Free	Slightly shivey - good color
27	65	--	35	--	--	--	--	Free	Slightly shivey - good color
7	90	--	--	10	--	--	--	Coarse - full of lime	
8	90	--	--	10	--	--	--	Very Coarse	Foam marks
9	90	--	--	10	--	--	--	Fine	Foam marks
10	90	--	--	10	--	--	--	Medium	Foam marks - crushing
11	90	--	--	10	--	--	--	Coarse	Foam marks - wild
12	90	--	--	10	--	--	--	Fine	Crushing
13	90	--	--	10	--	--	--	Fine	Slightly crushing
15	90	--	--	10	--	--	--	Fine	" "
16	90	--	--	10	--	--	--	Medium	Slightly crushing
18	90	--	--	--	--	--	10	Fine	Crushing
19	90	--	--	--	--	--	10	"	"
20	90	--	--	--	--	10	--	Very coarse	Foam spots
21	90	--	--	10	--	--	--	Coarse	Foam marks
22	90	--	--	--	--	--	10	Very fine	Crushing
23	92	--	8	--	--	--	--	Fine	Good formation
25 & 26	66	25	9	--	--	--	--	Medium	Only passable formation
26	91.5	--	8.5	--	--	--	--	Coarse	" " "

TABLE III.

Furnish	Weight per ream 500 sheets 24"x36"	Thickness	Weight per cubic foot	Mullen test	Mullen test divided by ream weight	Schopper tests: Breaking length: In machine direction	Breaking length: Across machine direction	Breaking length: Average	Stretch: In machine direction	Stretch: Across machine direction	Stretch: Average	Folding tests: In machine direction	Folding tests: Across machine direction	Folding tests: Average
Cook'n ed No. Pulp used	Pounds	Inches	Pounds	Points		Meters	Meters	Meters	%	%	%	%	%	%
17 10% sulphite	110	.0111	39.6	27.2	.249	3020	1580	2295	1.5	2.2	1.8	2.8	1.8	2.5
24 " "	48	.0034	54.0	17.3	.350	3240	2170	2705	2.4	6.1	4.2	55.4	27.0	51.2
24 " "	57	.0029	51.3	17.3	.467	4140	2400	3270	2.3	3.5	2.9	57.6	25.6	41.4
7 10% kraft	108	.0100	45.2	12.3	.114	1415	750	1083	0.6	0.8	0.7	1.0	1.0	1.0
9 "	110	.0124	32.9	14.3	.131	1535	854	1195	0.9	1.2	1.1	1.8	1.0	1.4
10 "	147	.0154	38.2	17.7	.120	1075	900	988	0.8	1.4	1.1	1.6	1.2	1.4
11 "	118	.0138	34.2	9.2	.084	808	466	637	0.9	1.0	1.0	2.4	1.6	2.0
12 "	121	.0140	35.4	11.2	.095	1141	540	841	0.8	1.2	1.1	2.0	1.4	1.7
13 "	161	.0164	36.8	13.5	.089	1262	610	939	1.1	1.5	1.3	1.2	1.0	1.1
15 "	117	.0144	32.5	10.0	.087	870	574	72	0.5	1.2	0.9	1.0	1.0	1.0
16 "	159	.0151	42.1	15.9	100	902	585	744	1.0	1.5	1.3	3.6	1.2	2.4
18 10% linters	110	.0103	42.7	9.7	.090	598	598	593	1.1	1.2	1.2	1.0	1.0	1.0
19 "	119	.0119	40.0	11.4	.096	850	492	671	0.9	0.9	0.9	2.0	1.4	1.7
21 10% kraft	114	.0120	38.	10.1	.089	1085	472	779	0.8	1.1	1.0	1.6	1.0	1.3
22 10% linters	159	.0138	46.0	15.5	.083	1010	568	789	1.0	1.0	1.0	3.0	1.8	2.3
23 "	118	.0145	32.6	14.8	.125	1338	782	1058	1.2	1.4	1.3	2.4	2.0	2.2
25 & 26 "	82	.0099	33.2	12.7	.155	1535	960	1250	1.7	2.1	1.9	2.0	1.4	1.7
26 "	135	.0144	37.5	11.9	.089	920	660	790	1.0	1.1	1.1	1.0	1.0	1.0
27 "	40	.0040	39.7	11.5	.284	2440	1370	1905	2.4	2.2	2.3	11.8	4.0	7.8

details in the manufacture of the material to give satisfactory results. Samples were also lined with sulphite paper and tried for cap stock at the Cedar Rapids plant of the Quaker Oats Company with very satisfactory results as to strength and grip on shrinking on to the tubular fibre containers.

Mill Runs.

In view of the results of the laboratory runs it was decided to make a trial of oat hulls at the strawboard mill of the Quaker Oats Company at Pekin, Illinois, and about 30 tons were run into boards of various types the week of June 15 and 18, 1921.

The mill is equipped with several spherical rotary boilers 14 feet in diameter, hollander type beating engines with drum washers, Jordan refining engines capable of being used either in tandem or parallel, and a 68 inch four cylinder board machine with forty dryers fitted with a hot air drying system.

Cooking Treatment.

The hulls were given the same cooking treatment used on the straw which was as follows

Lime per 100 lbs. bone dry hulls (Testing 99% CaO)	15.4 lbs.
Volume of cooking liquor at start per 100 lbs. dry hulls	24 gallons

The rotaries were loaded in the forenoon and heated with exhaust steam indicating 11 pounds per square inch until 3:00 o'clock in the afternoon when the exhaust steam was shut off and live steam turned on and, by means of a regulator, a pressure at the rotaries of 21 pounds per square inch was maintained. These conditions were maintained until 6:00 o'clock in the morning when the steam was shut off and the rotaries emptied as soon as space was provided for their contents some time in the forenoon.

The rotaries held a charge of 6-½ tons of straw but it was found that from 10 to 20 per cent more oat hulls could be charged and a charge of a mixture of 6860 pounds of air dry straw and 8800 pounds of air dry oat hulls was charged without over-loading. With straw it is necessary to rotate the boiler to pack the straw and take off the cover and recharge three or four times to make a complete charge while with oat hulls it could all be loaded with one filling and with oat hull straw mixtures only one refilling was necessary. Two rotaries of oat hulls, four rotaries of oat hull straw mixtures, and one rotary of 15,100 pounds of oat hulls and and 1000 pounds of second cut cotton linters air dry weight were cooked.

Washing Treatment.

The cooked oat hulls and oat hull and straw mixtures were allowed to stand in a pile as long as possible but on account of lack of time the average time in the pile was not more than 24 hours. They were then given a washing treatment of 3-½ hours at the end of which period the lime residues were practically removed. During the washing the beater roll did not touch the bed plate but nevertheless the stock was reduced to a considerable extent. One interesting feature was the fact that oat hull stock swells under the treatment while with straw stock there is a decrease in volume.

Paper Machine Trials.

The following runs were made on the paper machine:

1. Single manila lined strawboard.
   50% straw—50% oat hull.
2. Double manila lined strawboard.
   50% straw—50% oat hull.
3. Double manila lined strawboard.
   100% oat hull.
4. Egg case board.
   100% oat hull.
5. Egg case board.
   50% straw—50% oat hull.

Run No. 1 Single Manila Lined Strawboard.

In running from the straw furnish to the 50 per cent straw and 50 per cent oat hull furnish on single manila lined strawboard the only difficulty experienced was the greater ease with which the oat hull stock dried on account of the larger proportion of water removed by the presses. The change necessitated the altering of the steam pressure in the dryers and until it was properly adjusted considerable broke was made. After running several hours it was also observed that the oat hull stock was heavier and settled to a slight extent in the cylinder vats. This trouble did not prevent the run, however, and since connections were provided in the vats for water jets it would not be difficult to equip the machine for the new stock.

On the calenders the new furnish was found to take a very satisfactory finish and with water boxes on the calenders the appearance of the sheet was equal to the straight straw sheet usually run.

Run No. 2 Double Manila Lined Strawboard.

The change from single manila lined to double manila lined strawboard using 50 per cent straw and 50 per cent oat hull in each case was made without any trouble or break. In the double lined board the finish

obtained does not reflect the stock since it is taken entirely by the liner and the internal layers of straw and oat hull stock are not directly responsible. The product, however, was quite satisfactory as to finish, strength, adhesion of the layers, and stiffness.

Run No. 3 Double Manila Lined Strawboard—100 Per Cent Oat Hull.

In trying a furnish of 100 per cent oat hull which followed a run of straw egg case board trouble was experienced in adjusting the machine and by the time the sheet was running satisfactorily crushing occurred and the run was abandoned. The crushing was caused by the liner being too slow for stock such as oat hull which gives up its water readily on the presses. Unfortunately, during the night a considerable proportion of parchmentized paper scrap was used in the furnish of the liner which caused it to be slower than customary. Portions of the scrap also failed to be reduced in the beaters which caused spots in the sheet. While it was not possible with the amount of stock prepared to make paper to fill orders very satisfactory samples were obtained which are attached at the end of this report.

Run No. 4 Egg Case—100 Per Cent Oat Hull.

In run No. 4, egg straw board was made out of oat hull stock with certain proportions of cotton linter stock which could not be determined. Only 6-½ per cent was used in the rotary charge and a large proportion of the linters from the rotary was mixed with other rotary charges so it is doubtful whether there was more than 4 per cent of linter fibre in the furnish. The same trouble experienced in run No. 1 on account of over-drying was met and after the dryers were adjusted it was found that running at the rate of 23 tons per day, 7 pounds of steam was sufficient without using any hot air. A larger proportion of the moisture is pressed out of the oat hull stock by the presses than from straw and the capacity of a given set of dryers would be from ten to twenty per cent greater, an important consideration for mills with insufficient dryer capacity.

Run No. 5 Egg Case—50% Oat Hull—50% Straw.

There was no trouble in runing on to a 50 per cent straw furnish and the board obtained, as would be expected, showed less of the oat hull characteristics and more of the straw.

Mullen weight and thickness tests are given in Table IV. Run No. 1 was water finished and a very dense sheet was obtained with a relatively high pop test. Run No. 2 also gave a high pop test but run No. 3 was decidedly weaker.

TABLE IV.

Run No.	Furnish: Oat hulls	Furnish: Straw	Product	Calender ed	Wgt. per ream 500 sheets 24x36	Thickness	Wgt. per sq. ft.	Mullen test: On sheet	Mullen test: Per sq. in.	Rearing test or toughness: In machine direction	Rearing test or toughness: Across machine direction	Rearing test or toughness: Average
	%	%			Lbs.	In.	Lbs.	#/sq. in.	#/sq. in.	Gms.	Gms.	Gms.
1	50	50	Single Manila lined	Yes	316	.024	52.5	71.4	.226	--	--	--
2	50	50	Double Manila lined	Yes	358	.033	43.6	76.4	.214	--	--	--
3	100	--	Double Manila lined	No	316	.037	34.0	51.0	.161	--	--	--
4	100	--	Egg case	Yes	400	.035	45.7	46.4	.116	800	422	611
	100	--	"	No	400	.039	42.1	46.2	.114	--	--	--
5	50	50	"	Yes	374	.031	48.5	67.2	.180	896	519	707
Stock	--	100	"	Yes	282	.026	44.2	71.2	.253	848	528	688

The egg case board run No. 4, in which 100 per cent oat hulls were used is also much weaker than run No. 5 where equal parts of oat hulls and straw were used. The weight of the papers per cubic foot indicate that oat hull papers can be compressed by calendering and weigh about the same as the straight straw board.

Summary.

The results of the semi-commercial and mill runs on oat hulls indicate that they are capable of utilization in the manufacture of board using digestion with lime in the same manner that straw is treated. The yields obtained and character of the stock indicate that the cost of converting oat hulls to board would not exceed the cost of converting straw and in the yard and rotary room labor savings of approximately 50 cents per ton of product are possible. Savings in steam required for drying are also possible. The bursting strength of sheets made from oat hulls is not as high as from straw board but very satisfactory results may be secured using oat hulls mixed with straw in equal proportions and tougher sheets than are possible from either oat hulls or straw are obtained by cooking small amount of cotton linters together with the hulls in the rotaries. Raw cotton linters are a very cheap source of fibre and grades not satisfactory for fine papers on account of dirt, although possessing excellent fibre, are entirely satisfactory and can be obtained at between $10 and $15 per ton, f.o.b. oil mills in the South. The possibilities of using even larger proportions of linters in the manufacture of other grades of papers than were used in the lime cooks of these experiments warrant investigation and in the opinion of the President of a large board manufacturing organization, who witnessed the mill trials, seem capable of considerable application.

The facility with which straw was replaced by oat hulls in the trials herein described would indicate that paper and board manufacturers using straw as a raw material could readily try out oat hulls in their plants under their particular conditions and ascertain the feasibility of the material for their particular products.

The runs on mixtures of oat hulls mixed with either cotton linters or cotton hull fibre using the sulphate process are very interesting and the excellent color of the pulps together with the high yields indicate that a promising source of pulp for the manufacture of book, high grade magazine, common writing and similar grades might be developed. The experiments indicate that a mill fitted with rotary boilers and washing and bleaching equipment could handle the stock and it is recommended that mill trials be arranged if possible.

The costs for making one ton of bleached pulp would appear to be as follows:

2220	pounds oat hulls at $6.00 per ton	$6.66
1110	" cotton linters at $20.00 per ton	11.10
530	" soda ash at $1.75 per hundred	9.28
280	" quick lime at $10.00 per ton	1.40
165	" sulphur at $20.00 per ton	1.65
100	" bleaching powder at $2.50 per 100	2.50
1 ton of coal at $5.00 per ton		5.00
Labor based on unskilled labor at $3.00 per 8 hr. day		7.50
Conversion		2.00
Overhead		2.50
	Total	$49.59

These costs are based on the cost of a 30 ton plant which is capable of turning out bleached pulp in sheets of approximately 80 per cent moisture content with no

recovery of the soda being about $300,000. Bleached soda pulp, which the pulp in question could replace, is quoted at present at $90 per ton, and with mounting wood costs, it seems doubtful whether it can ever be manufactured by present pulp mills for less than $70 per ton. Most of the work of the experiments described herein was devoted to the utilization of oats hulls by the strawboard industry since it was believed that it could be utilized there with the least change from present customs and habits. The promising margin of profit, however, allowed by the estimates of the cost of manufacturing bleached pulps from oat hulls and cotton linters by the sulphate process makes the desirability of mill trials particularly strong.

American Pulp and Paper Convention

By ROSCOE SMITH.
(Written specially for Pulp & Paper Magazine.)

Chicago, Nov. 5.—That part of the world concerning itself with the conversion of forests into wood pulp and in the manufacturing and distribution of paper made largely from the product of the forests turned its eyes toward Chicago last week where the men most prominent in this important and essential paper industry gathered to hold a series of conferences promising many good things for the future of the industry.

Technically the meeting was held under the auspices of the American Pulp and Paper Association with its allied and subsidiary organizations joining in what is termed the Fall Business Convention, and the scene was laid in the new Drake Hotel, though some of the association conferences were held at the Blackstone Hotel.

Danger in low foreign prices, cheap labor in Europe and depreciated exchange were regarded as a serious menace to the American paper industry and shipping and manufacturing costs was the main topic Tuesday morning when the Salesmen's Association met to discuss these all-important subjects. Two thirds of the news print used in the United States was made last year from wood grown on foreign soil. Out of more than 4,500,000 tons of wood pulp consumed for all purposes 35 percent came from foreign markets. Over $191,000,000 was paid for the pulpwood, wood pulp and paper imported. Judging from these figures disclosed at the conference, it is easily understood to what extent America has become dependent on outside markets beyond its control. The United States no longer can rely on its eastern forest lands because of their depletion, for an adequate supply of pulpwood the cost for this reason having risen over 110 percent in the five year period 1916-1920 and of wood pulp 35 percent.

Two notable statements were made at the Salesmen's Association Conference, the first business session scheduled, during a discussion on paper imports.

"It costs $2 less to ship a ton of newsprint paper from Germany to New York City than to ship a ton of the same paper from Niagara Falls across the state of New York," said Secretary Kellogg, of the News Print Service Bureau. Continuing his discussion of vital statistics Mr. Kellogg gave figures showing comparative freight rates between foreign shipping points and American points, as evidence of the serious conditions confronting the paper industry in general.

"America's paper industry faces serious competition of paper importations from foreign lands not alone because of the fact that foreign paper is made by cheap labor, under depreciated exchange conditions, but also because of the cost of freight shipments.

A number of comparative rates were quoted last week.

"It is better for the American user of newsprint to have a dependable source of supply at home at a price which affords a reasonable profit to the manufacturer and thus encourage greater production than to have a temporary supply from abroad at prices fixed by ruinous unfair competition, which will vanish when world conditions again approach normal."

The American Trade Association Executives Association was represented at the meeting by President Naylor who advocated open co-operation of the paper associations with the government and the public in general.

"I approve Mr. Hoover's suggestion of open information," said Mr. Naylor. "By reporting definite representative information to the government the association will be strengthened, and benefit will come not only to the industry, but to our national industrial stability through a frank understanding of facts. Elimination of mushroom, illegal trade associations is absolutely necessary not only for the good of the public, but also for our own profession as trade associations. I cannot resist suggesting that if the general facts of an industry are to be made public through a government agency that the government agency use the trade association which represents that industry as the source of correct information, otherwise there would have to be a board of experts at Washington for every industry to do the work in which the existing trade association is a specialist."

The second day was a day of action for the various associations, some of the meetings running parallel with others. An extended program of conferences opened with the Woodlands Section its members being in truth, the pioneers of the paper industry—the foresters. Heavy reductions in woods operations by the paper and pulp manufacturers were reported by Secretary O. M. Porter who gave the results of a survey of wood on hand and projected operations. There will be no shortage immediately of raw material, for the reports indicate there is still a large quantity of pulp wood in the hands of manufacturers even though this was put in at prices far above the presumptive cost of woods operations during the coming winter.

"Reports from 48 companies" said Secretary Porter, "are sufficiently distributed to provide probably an accurate estimate of the whole situation:

"The 1920 consumption of wood pulp by these mills was 1,855,005 cords and their stocks on hand September 1 was 2,292,483 cords. Pulp manufacturers usually carry two years stock of wood on hand, but this year are putting in only 792,630 cords. The small input this year, however, less than one half of last year's consumption, portends extremely low stocks in the Fall of 1922.

"These figures," said Secretary Porter in conclusion,

"reflect very clearly the present wood pulp market situation. American mills are overstocked with high priced wood and are curtailing their logging operations, in many cases from 50 to 70 percent of the 1920 operations. Of the 87 mills making reports, 27 reported they were making no contracts for any wood this winter."

The Waxed Paper Association are sponsors for the statement that buyers of fancy articles are buying once more. O. B. Towne, Secretary of the Waxed Paper, Vegetable parchment, Glassine and Greaseproof manufacturers association said that increasing orders for waxed and vegetable parchment paper sufficient to warrant a resumption of production by mills of this group, tell the story of how the business in fancy foods has turned the corner.

"These papers are used for the finest kinds of foodstuffs for the wrapping of fancy foods, the luxuries. This kind of business is the first to fall off when there is business depression. The return to normalcy tells a sure story that the buyers of fancy articles are buying once more. The mills have been running at a very small percentage of capacity but now business is warranting the enlargement of operations.

"A unique feature of this industry has been the growing demand for baker's bread, as indicated by sales of bread wrappers, forming an important part of the waxed paper industry. The bread wrapper business has held its own through the entire period of depression, a significant indication of the manner in which the public is buying baker's wrapped bread, instead of baking at home. The demand has also manifested itself in the extension of bread wrapping to bakeries which formerly shipped bread unwrapped. Confectioners are back in the market also for waxed paper for candies on a large scale."

That the speculative element in the handling of paper should be eliminated in the interest of the ultimate consumer, was the opinion of George W. Sisson, Jr., of Potsdam, N.Y. in discussing the present condition of the market for coarse papers, such as wrapping and other types. Mr. Sisson said that the business situation in this industry was now exactly where it was thirty months ago, when the cycle of business, starting with general inactivity, developed the prosperity felt in 1919 by the paper industry, as well as by business in general, and followed by depression and months of reduced production and a decreased volume of business.

"Two fundamental factors," said Mr. Sisson, "the general financial situation and the completion of the liquidation of stocks made when raw materials were at the highest point ever known, now favor a better period of business. It would seem from consideration of these matters to-day that the manufacturers of coarse papers can be careful by handling their business from now on in anticipation of a steady return to normal production, normal shipments, and normal profits. This will be more assured if those who merchandise our products realize that there should not be a speculative attitude in our relations, but that each should render service to the other on a fair basis of "pay for value received" to the end that the public whom we both finally serve, shall be supplied its needs at a fair cost, consistent with stability and continuity in the business of the merchant and manufacturer."

Perfect packages packed in paper formed one of the topics of the Gummed Paper manufacturers of the United States' meeting when the association announced that it would participate in November's observance of "perfect package month" as planned by the American Railway Association and the American Railway Express.

One hundered and forty tons of paper will be used in the "Prosperity Advertising Campaign" of the Rotary Clubs of America, according to Dr. Hugh P. Baker, executive secretary of the American Paper and Pulp Association, in an address delivered before the Chicago Rotary Club during the day's activities of the paper men. Dr. Baker is a member of the New York Rotary Club which has organized a national prosperity advertising campaign on bill boards, for nearly every part of which material and services have been contributed.

"Not alone was the paper contributed by manufacturers at less than cost," said Dr. Baker, "but the billboard owners have contributed advertising space and materials worth $1,500,000. The campaign will last three months and 5,000 pounds of ink will be used to put out nine slogans on 100,000 billboards in 8,000 cities, towns and villages. Lithographers here have given the small posters, printing has been done less than cost, and the entire campaign has been financed at a cost of $60,000, a large part of which is shipping advertising material."

Thursday's sessions were opened with an illuminating address on magazine publishing tonnage by Norman Wilson, of the Hammermill Company of Erie, Pa. While the tonnage has been severely affected by a decrease in advertising amounting to 37 percent less this year than in 1920, still this year's advertising is but 19 percent less than in 1919, while it is actually 10 percent higher than in 1918, according to Mr. Wilson in his report of the fine paper industry.

"The consumption of book paper may be measured to a large extent by the activities of the printing and the magazine publishing industries said Mr. Wilson, "and the consumption of cover and writing papers by the printing industry alone. Large advertising campaigns are laid out for next year and the printing industry is now running at approximately 84 percent. This is equal to if not in actual excess of the percentage that is being ordered from the paper mills, so that consumption is running ahead of orders.

"At the end of the first quarter of this year, the manufacturer of book, cover, tissue or writing paper was fortunate if he was able to operate to 50 percent of his capacity. The resumption of business however, in the third quarter brought up the average so that for the first nine months of this year production of fine papers was only 39 percent less than in 1920. The tissue paper industry was one of the first to recover from the severe depression and the demand is now better than normal. Orders for book cover and writing papers have taken a decided upturn in September and October."

The two concluding talks of the last day of the Paper men's meet were devoted to general topics relating to allied business and conditions underlying such industries. O. A. Miller, president of the Central Ohio Paper Co. of Columbus Ohio pleaded for maintenance of a high standard of ethics to the end that all may land safely on solid ground.

Mr. Miller said it was fine to see manufacturers and merchants coming together to consider what was best for all, that it was the manufacturers business to make paper and the merchant's sphere to sell it, and the closer the co-operation between the two the greater the degree of success to be attained.

President W. H. Finley of the Chicago and Northwestern Railroad said that expenses were ruining the railroads and that present operating costs menace

transportation. The speaker advocated an equalization of values in wages and interest rates so the roads can be removed from their precarious situation.

Other speakers at the closing session were President Joseph H Defrees of the U.S. Chamber of Commerce who assailed high sur-taxes and tax-free investments voiced a plea for the rehabiliation of the farmer, who, he declared, was the worst hit of all classes as a result of depression in business; J. H. Stannard, of the Grand Lake Paper Company, New York City, Edward F. Herrlinger, Herrlinger Paper Co. of Cincinnati, and president of the National Paper Trade Association; and Thomas E. Donelly of Chicago also spoke briefly.

As a fitting finale of the papermen's conclave, motion pictures were shown of paper in the making from the forest to the consumer, and these pictures were viewed with great interest. The Rothacker Film Company told the delegates how film advertising was gradually teaching everybody the wonderful romances of trades hitherto a closed book to the world at large.

The meeting was marked by dinners, entertainments and sightseeing under the auspices of local organizations.

British Trade News

(From Our London Correspondent).

London, Oct. 21, 1921.

"The manufacture of newsprint in Canada from standing timber to finished sheet" is the title of a film now being shown to students of technical schools in papermaking round and about London. Messrs. Charles Walmsley & Co., the well known papermill engineers, kindly lend the film, which is shoun under the auspices of the Technical Section of the British Paper makers' Association. Messrs. John Dickinson & Co., Ltd., of the Croxley Paper mill are also displaying to their friends and customers a film illustrating the process of manufacture of some of their fine quality papers. As a side show they exhibit the raw materials used and a mill expert explains their application in the course of manufacturing paper. These films prove a great advertisement, but there is nothing yet produced to beat the Canadian film, which has more than astonished the general public, the majority having a slight conception of the great resources of the Dominion, or paper manufactured in it.

The Papermakers' Collection.

Canadians would do well to recognise the little scheme that Mr. A. W. Foster, B.A., the Secretary of British Papermakers' Association, has been conducting for some time past. He is collecting for the Association—for reference purposes as well as to preserve them for the use of future generations and the industry—old books, records, prints, curios, etc., dealing with and relating to paper manufacture. By this means he is gradually assembling a historical department, which at the moment is full of interest and valuable. Nearly all the books and records are presents from various mill owners and if Canadians have not already adopted a similar department it would be a wise move to start one for the sake of the history of pulp and paper manufacture. I am wondering how many in Canada today are in possession of the "Proposed Constitution" rules of the Canadian Pulp and Paper Association. Mr. A. G. McIntyre's name appears at the end of them as Secretary of Committee and the "proposed constitution" was subimtted by a Toronto meeting of pulp and paper makers, but the document is undated. I should say it was 8 or 9 years old; but old documents and old books should not be lost sight of, or the early files of "The Pulp and Paper Magazine," when it was pocket size, would also prove invaluable and a source of instruction.

Pulp Imports Down.

The imports of raw materials show a considerable decline in September, compared with August, and the total for the nine months, January to Sept. is only 466,423 tons, as againsts 981,334 tons for the corresponding period in 1920.

GROUNDWOOD.—Thanks to large shipments from Canada moist groundwood shipments to the United Kingdom exceeded those of August, but there is still considerably headway to be made to make up on the 1920 returns, as the following figures show:— From Sweden, 4,900 tons in Sept. (10,038 tons between Jan. and Sept., against 69,380 tons in 1920); Norway, 15,463 tons (135,768 tons 1921; 246,058 tons 1920); Canada, 21,116 tons—9,632 tons in Sept. 1920—(79,676 tons 1921; 56,825 tons 1920); other places 4,330 tons (10,672 tons 1921; 3,386 tons 1920). These figures are gratifying and encouraging to Dominion pulpmen. They show that while supplies have fallen off from foreign countries the British Dominion of Canada has increased shipments. Sweden's 4,900 tons in Sept. are valued at £42,657; Norway's 15,463 tons at £128,399; Canada's 21,116 tons at £321,557. A simple division calculation will give the shipping value per ton. Groundwood, 50 per cent. moist, can be bought in London at £4 a ton for prompt delivery.

UNBLEACHED CHEMICAL (Dry).—Total supplies 15,533 tons in Sept. and 54,967 tons in August; Jan.-Sept. 148,916 tons as against 389,032 tons in 1920. From Finland 918 tons in Sept. (4,482 tons Jan.-Sept. 1921; 34,067 tons 1920); Sweden, 11,238 tons (103,193 tons 1921; 243,284 tons 1920); Norway, 1,175 tons (27,591 tons 1921; 75,687 tons 1920); Germany, 78 tons (4,682 tons 1921; 5,556 tons 1920); Canada and other countries, 2,124 tons, (8,967 tons 1921; 30,438 tons 1920).

BLEACHED CHEMICAL (Dry).—Total shipments in Sept. 1,454 tons; August 1,475 tons. January-Sept. 10,697 tons against 21,945 tons in 1920. From Finland, 56 tons (107 tons Jan.-Sept. 1921; 1 ton 1920); Sweden, 961 tons (2,151 tons 1921; 3,450 tons 1920; Norway, 284 tons (7,251 tons 1921; 12,799 tons 1920); Germany, 4 tons (144 tons 1921; 505 tons 1920); Canada and other countries, 149 tons (1,044 tons 1921; 5,190 tons 1920).

CHEMICAL (Wet).—1,070 tons for January to Sept., against 9,520 tons for same period in 1920. No supplies were received in Sept.

ESPARTO.—Total supplies 9,999 tons in Sept, and 7,901 tons in August; Jan.-Sept. 59,031 tons against 130,854 tons in 1920.

Market quotations for chemical pulp in Canada at present are £19.15s to £20 for bleached sulphite; easy bleaching £14; sulphite newsprint (strong) £12½; unbleached soda (No. 1) £10½; soda kraft, £12 a ton. The market has a brighter outlook and an optimistic tone. Spanish Esparto is £6.10 a ton; other qualities £4.5s.

Exports of British Papers.

The imports of papers are considerably in excess of the exports of British manufactures. For the sake of comparison I give the figures from January-Sept. and included in the exports are envelopes, paper bags, playing cards, boxes and cartons.

	Imports cwts.	Exports cwts.
1921	4,536,087	1,069,440
1920	10,609,512	1,590,281

These figures do not show a healthy sign for British mills. The principal exports in Sept. were:—

PRINTING PAPER: To France, 1,062 cwts. (6,917 cwts. Jan.-Sept. 1921; 62,382 cwts. 1920); U. S. A. 391 cwts. (5,887 cwts. 1921); 5,039 cwts. 1920); other foreign places, 26,084 cwts. (114,592 cwts.; 194,985 cwts. in 1920); South Africa, 6,750 cwts. (57,755 cwts. 1921; 47,411 cwts.); India, 6,853 cwts. (74,165 cwts.; 190,688 cwts. in 1920; Strait Settlements, 1,165 cwts. (8,245 cwts. 1921; 9,751 cwts.) Ceylon, 2,304 cwts. (12,287 cwts; 15,272 cwts. in 1920; Australia, 25,015 cwts. (219,156 cwts. 1921; 86,308 cwts.); New Zealand, 5,507 cwts. (37,977 cwts.; 24,034 cwts. in 1920; Canada, 26 cwts.—61 cwts. in Sept. 1920—(1,881 cwts. in 1921; 1,180 cwts. 1920); Other places, 2,756 cwts. (26,461 cwts.; 42,800 cwts. in 1920). Total for Sept. 77,913 cwts.; August 40,861 cwts. (565,323 cwts. 1921; 679,841 cwts. 1920).

WRITING PAPER.—To France, 281 cwts. (1,593 cwts. 1921; 20,693 cwts. 1920); U. S. A., 32 cwts. (623 cwts. 1920); other foreign places 2,304 cwts. (18,462 cwts. 1921; 29,012 cwts.); South Africa, 1,429 cwts. (6,588 cwts. 1921; 5,614 cwts.); India, 5,163 cwts. (25,671 cwts.; 47,592 cwts in 1920); Straits Settlements, 62 cwts. (2,222 cwts. 1921; 3,901 cwts.); Ceylon, 27 cwts. (1,113 cwts. 1921; 3,002 cwts.); Australia 3,406 cwts. (26,210 cwts.; 31,675 cwts. in 1920); New Zealand, 887 cwts. (11,180 cwts. 1921; 9,315 cwts); Canada 50 cwts.—24 cwts. in Sept. 1920—(944 cwts; 435 cwts. in 1920); other places, 893 cwts (6,908 cwts. 1921; 9,511 cwts. 1920). Total—14,534 cwts in Sept.; August 8,224 cwts. (101,514 cwts. 1921—for 9 months— as against 161,191 cwts. in 1920).

Imports of Paper.

During August and September no newsprint supplies were received from Canada and the total for the nine months reaches only 5,203 cwts. compared with 146,328 cwts. in 1920. Newfoundland shipped 25,320 cwts. in Sept. bringing the total (for 1921) to date 435,470 cwts, as against 669,885 for 1920. The Dominion trade with United Kingdom in packing and wrapping papers increased in Sept to 1,530 cwts., compared with August's 302 cwts. and the total nine months supply now reaches 12,393 cwts. against 103,033 cwts. in 1920. Taken all round there are decreases in packings and wrappings from all countries. Sweden, one of the important suppliers dropping from 1,653,019 cwts. from Jan.-Sept. 1920 to 376,153 cwts. in 1921 for the corresponding period. Coated Papers are down to the smallest shipments—the supplies to rate being about one third of 1920 shipments.

Germany and Finland are still supplying the British paper market. Indeed, it is greatly to be feared that these countries have captured the market to the detriment of Canada and it would be interesting to know how things are working out in England, when the rate of exchange is considered, for German paper. Before the war the value of the mark was 20 to the British sovereign; today it takes 665-675 marks to make up the sovereign. We hear a great deal about the fall of the mark, but the Englishman will not tell us how he is faring on the sale of German paper and pulp in his market.

THE GERMANS DONT GET AWAY WITH IT.

Editor, Pulp and Paper Magazine.

The magazine of the 27th is to hand, and in the pulp and paper news, page 1103, the third item reads in part as follows:

> "Among the exhibits at the Convention of the U.T.A. which covered the entire mezzanine floor of the King Edward Hotel, Toronto, the one which attracted the most general interest was what is claimed to be the smallest paper-making machine in the world. The machine in question was made in Germany and was smuggled out of the country after the war. Lord Northcliffe wanted to buy it, and offered $25,000 for it, but the American Writing Paper Company of Holyoke, Mass. outbid him and secured it."

The writer saw this machine, and in conversation with one of the men in charge of the exhibit, asked if it were not one of the MARSHALL machines, having the impression that T. J. Marshall and Company had made several of them. He said to me, in effect, "This is The Marshall machine," and later explained how the wet end of it had been made by Marshall, and that Mr. Sindall or Mr. Bacon had become so interested in it that the dryer section, calenders and winder had later been added from their designs. I think it is no use allowing our German friends to get away with any more than their rightful credit in these matters, and the enterprise of Messrs. Marshall of London, England, should be recognized.

In a letter to the writer in discussing the question of papermaking school in 1910, Messrs. Marshall sent a specification of the machine with quotation. Among other things they say, "We are constantly exhibiting these machines all over this country, and we have one running for six months at the Angle-Japanese Exhibition this year for the Daily Mail newspaper and also one at the Pageant of Empire at the Crystal for the Daily Mail." As Messrs. Marshall then quoted one of these machines to the writer at 300 pounds, f.o.b., London, and as two of them were at that time being exhibited for the Daily Mail, Lord Northcliffe's paper, it is not very likely that he offered anything like $25,000 for the present machine.

Yours very truly, T. Linsey Crossley.

PRINCE GEORGE MILL TO BE LARGE.

The Directors of the Prince George pulp mill were in Victoria last month conferring with the government heads in respect to final arrangements for the erection of a mammoth plant at the Fraser River town.

When completed the Prince George mill will be one of the largest pulp plants on the continent, and the greatest in western Canada.

Seven million dollars will be invested in the undertaking while the size of the mill may be gauged from the fact that 10,000 horsepower will be used to operate the machinery. E. W. Bowness of Edmonton, is consulting engineer for the new power plant.

The Board of Directors of the Abitibi Power & Paper Co. were so pleased with their recent inspection of the plant and the town that a resolution of appreciation and congratulation was voted and sent to Manager McInnis.

Premier Drury was much impressed by his visit to Iroquois Falls. The folks took him in and gave him a good time, including a delightful theatrical entertainment by local talent.

A HANDY CHART FOR DETERMINING THE FLOW THROUGH PIPES.

By W. F. Schaphorst.

By simply laying a straight edge across the accompanyng chart any one of these questions may be answered.

1. How many cubic feet will flow through a pipe of known internal diameter at a given velocity?

2. How many gallons?—other conditions being the same as in (1).

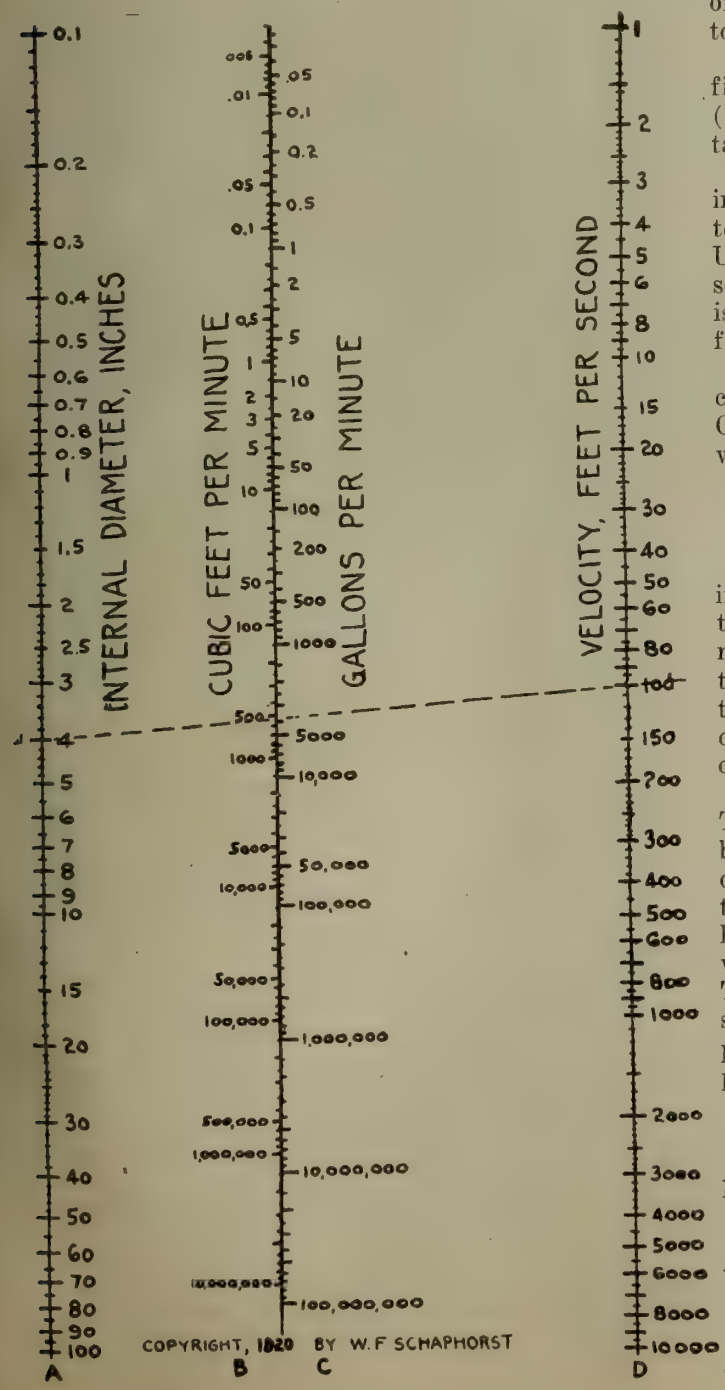
3. What will be the velocity in ft. per second, knowing the diameter and cu. ft. of flow per minute?

4. Same as (3) except that the flow is given in gal. per min.

5. What diameter of pipe must be used to carry a given number of cu. ft. per min. at a given velocity?

6. Same as (5) except that quantity is in gal. per min.

For example, how many gallons per minute will flow through a 4-inch pipe at 100 ft. per second velocity?



The dotted line shows how it is done. Connect the 4 (column A) with the 100 (column D) and locate the intersection with the middle column. Column C tells us the answer—very close to 3,900 gallons per minute.

The range of the chart, it will be noted, is very great. It will handle a water velocity as low as 1 ft. per second, and a steam or gas velocity as high as 10,000 ft. per second. The range for pipe diameters runs from 1/10 inch to over 8 feet. The maximum flow shown on the chart is 100,000,000 gallons per minute, or over 10,000,000 cubic feet.—The Paper Industry.

U.S. RULING ON DUMPED FOREIGN PAPER.

The first specific ruling that paper is being dumped in the United States in contravention of the anti-dumping statute has been made by the Secretary of the Treasury at Washington, the type of paper involved being goat skin parchment. The decision is not only the first relative to paper importations, but is said to be the first of its kind under the anti-dumping act of 1921 relative to any importations.

The memorandum sent to collectors of customs specifies the product of a certain London manufacturer, (Wiggins, Teape & Company) is signed by the Secretary of the Treasury, and says in part:

"After due investigation I find that the paper making industry in the United States is being, or is likely to be injured by reason of the importation into the United States of goatskin parchment paper, first and second quality, and that such merchandise was sold and is likely to be sold in the United States at less than its fair value.

"For any further description of this particular merchandise, appraising officers will communicate with the Comparative Valuation Reports Bureau at New York, where samples are on file."

SURE OF SUCCESS OF JAMES BAY LINE.

Cochrane, Ont., Oct. 29.—In the presence of a gathering of 3,000 people, drawn from every point in Northern Ontario, Premier E. C. Drury at 2.20 this afternoon turned the first sod in the projected extension of the T. & N. O. Railway from Cochrane seventy miles towards Oil Can Portage. A special train of thirteen cars came from North Bay and another train of five cars brought people from the Iroquois Falls District.

At a luncheon tendered by the Cochrane Board of Trade, Premier Drury emphasized the Government's belief in the future of the north country and stated that other large undertakings had prevented previous action on the extension by the Government. He wished he was as sure of the success of the hydro-electric development as he was of the James Bay extension of the T. and N. O. The Premier referred to talk of succession as "utter nonsense." The government's aim, he pointed out, was to place the T. and N. O. on a self-supporting basis.

If we carried out all our good intentions, a lot of people in this world would be made wonderfully happy.

The moment a man feels he can rest on his laurels, that moment he begins to slide back.

If you are going to do a good thing do it now; if you are going to do a mean thing, wait till to-morrow.

Technical Section

CLASSIFICATION CHANGES.

R-6. Manufacturing System, has been changed in the Technical Section code for filing abstracts. This number is now **Printing, etc.**

R-12 now reads **Manufacturing System and Costs.**

M-11 now reads **Tanks and Pipes.**

Q-4 now reads **Concrete, Brick, and Masonry.**

REVIEW OF RECENT LITERATURE.

A-3. Reed as Papermaking Material.—A Klein, **Paper Trade Journal,** ixxiii, 12.—A discussion is given of the possibilities of the use of reed, Phragmites communis, and details as to its utilization in Europe. The fiber is comparable with that of esparto.—H. E. W.

A-4; A-5. Cellulose Determination. Paper, xxviii, 14 (June 8, 1921). Translation by CLARENCE JAY WEST from **Die chemische Untersuchung pflanzlicher Rohstoffe, und der daraus abgeschiedenen Zellstoffe.** Jentgen's method of determining the cellulose content of pulp is as follows: 10 Gm. of pulp (cut into small pieces) is covered with 50 Cc. of 17 to 18 percent caustic soda solution, allowed to stand 30 minutes, rubbed with 50 Cc. of water, filtered on a Buchner funnel with a fine cotton filter, and carefully sucked dry. The residue is washed free from alkali with cold water (usually 10 to 12 washings using 50 Cc. for each wash), then with hot dilute acetic acid, then with hot water (6 to 8 times) dried, and weighed. Beta-cellulose is determined by acidifying the alkaline filtrate with glacial acetic acid heating on the water-bath until the beta-cellulose coagulates and settles out, filtering on a fine cotton filter, washing 6 to 8 times with hot water, transferring to a porcelain dish, drying and weighing. The gamma-cellulose and impurities are determined by difference. For determining the total cellulose, 0.25 Gm. of pulp is rubbed with 25 Cc. of 17 per cent sodium hydroxide solution; after half an hour 0.5 Cc. of concentrated sulphuric acid is added, then 40 Cc. to dissolve all the cellulose. Two Gm. of pulverized potassium bichromate are gradually added, and the solution heated just to boiling for one hour. After cooling it is titrated with 0.1 normal ferous ammonium sulphate solution (using potassium ferricyanide as outside indicator) to determine the amount of oxygen required for the oxidation of the cellulose. In the determination of beta-cellulose, best results have been obtained by acidifying an aliquot of the filtrate with glacial acetic acid, diluting with five volumes of water, allowing to stand overnight, and filtering. It is thoroughly washed with hot water, transferred to a platinum dish, dried and weighed.—A.P.-C.

A-14. Analysis of Cardboard.—R. Isnard, **La Papeteries,** Feb. 10, 1921. Translated by A. Papineau-Couture, **Paper Trade Journal,** lxxii, 12 Sept. 22, 1921.—H. E. W.

B-2. Cost of Artificial Forests.—**Paper Mill,** xliv. 37, Sept. 10, 1921.—The actual costs of commercial planting of forests are much lower than has customarily been estimated. The cost figures for New York, New Jersey, Vermont, and Ohio are given. The low cost figure for establishing new forests indicates that there will be a widespread expansion of reforestation activity in the east.—H. E. W.

B-4. Utilizing Waste Wood.—Paper Mill, xliv, 37.—Research work by J. H. Wallace & Company has shown it possible to utilize entirely waste wood. The waste which is sufficiently resinate is extracted by a "steam and solvent" process. The residue from this and all the other wood is destructively distilled.—H. E. W.

C-6. Saw Mill Equipment. R. R. FOX, **Paper,** xxviii, 16 (June 22, 1921). General discussion of the importance of proper wood room equipment and of the manner in which manufacturers of this equipment are endeavoring continually to improve their products.—A.P.-C.

D-4. Grinding Tests of Infected and Sound Pulpwood. JOHN S. BATES, **Pulp and Paper,** xix, (June 30, 1921). Detailed account of mill scale experiments carried out in May, 1920, at the Jonquières mill of Price Bros. and Co., Ltd., the main object of which was to compare the yields of groundwood pulp from average, infected and sound pulpwood. At the same time various measurements of the wood and tests of the pulp were made. Five cords each of infected wood, sound balsam fir, sound spruce, and average wood as used by the mill, were used for the tests. The blocks had been stored about two years with some of the bark still on. The selected rotten wood was discolored brown to the extent of about 35 to 40 percent of the total wood mass (no particular estimations were made). In general the infected portions were still firm, though some punky blocks were present. Nearly all the sorted rotten wood proved to be balsam fir, while the average wood was about half balsam fir and half spruce, with some 5 to 10 percent of the mass showing signs of infection. The yields of oven-dry pulp based on oven-dry were 91.1 percent for average wood, 93.9 percent from infected wood, and 92.3 percent from sound wood. Although some of the measurements were subject to slight inaccuracies, it may be said in general that the total quantities of pulp were directly proportional to the dry weights of the wood with yields of about 92 percent on the oven-dry basis. The infected wood yielded better than was expected. The time of grinding (for five cords) was only 2.25 hours for infected wood, and 3.5 hours for sound spruce. The pulp from infected wood was decidedly brown, while spruce pulp was the best in general appearance. Microscopic analysis showed the infected pulp to be a mixture of coarse fibers with a large amount of fine woodflour, whereas the other pulps were less extreme in variation of fibre sizes. The freeness tests showed little difference in drainage properties between infected and average pulps, but the balsam fir fibers were considerably freer than the rest. A beater was furnished with spruce groundwood and about 27 percent of regular sulphite; on the paper machine the stock ran well with no breaks and the paper produced was of good color. Under the same conditions the balsam fir groundwood mixture caused a number of breaks and the stock was rather "soft," though the paper tested almost as well. Infected pulp was mixed with an equal quantity of

average groundwood in the beater along with the usual proportion of sulphite. On the paper machine the stock was slow and sticky, and there was considerable difficulty in taking the sheet off the couch roll to the presses. There were many breaks and very little finished paper was produced. The paper made tested surprisingly well, but was decidedly brown in color. The quality of infected groundwood is therefore much inferior for papermaking. If rotten wood has to be ground, it appears that the pulp should be mixed in small amounts with the regular supply of groundwood. A test on the storage qualities of the different pulps showed the danger of infected groundwood spreading decay through a pile of pulp in storage.—A. P.-C.

E-2. Adhesives from Waste Sulphite Lyes. A survey of German patent literature by S. HALEN, translated by C. J. WEST from **Kunststoffe,** xi, 12; **Paper Trade Journal,** August 25, 1921. The article is a digest of German patents secured by Leonhardt, A. Mitscherlich, Jurgensen, Nieus and Combel, Ekmann, Alexander-Katz, Stutzer, Trainer, Pollassek, Huttens, Glaasz and Wipfler.—H. E. W.

F-5. Preliminary Impregnation of Chips with Cooking. (Soda and Sulphate).—**Paper Mill, xliv,** 36. Technical Notes of the Forest Products Laboratory.—The results of tests made by the Forest Products Laboratory show greater uniformity of cooking, increased yields, decreased time of cooking, decreased bleach consumption and increased density of black liquor. The latter caused an increase of 25 per cent in the output of the recovery house.—H. E. W.

F-5; K-6. Digestion of Straw with Sodium Carbonate.—Fritz Paschke, **Wochenblatt Fur Papier-fabrikation,** lii, 23 (1921).—Translated by C. J. West in **Paper Trade Journal,** August 25, 1921.—Sodium carbonate is said to yield better pulp from stray than does caustic soda owing to the fact that the carbonate acts sufficiently on the lignin but does not attack the cellulose as does the caustic. Straw may be completely digested with sodium carbonate at eight atmospheres pressure with a yield of 40 to 45 per cent. Lignin residues separate from the wast liquor on standing and are used as fuel for waste recovery plants.—H. E. W.

G-6; K-11. Pulp and Paper Screens. PHILLIPS DENNET, **Paper,** xxviii, 4 (June 8, 1921). Historical survey of the development of screens, together with a discussion of the various types of pulp screens and of paper screens, of the differences between them, and of their relative merits.—A.P.-C.

G-11; K-13. Waste Recovery in the Paper Industry. Porf. E. BLAU, **Papierfabrikant,** xxxii, 845, August 12, 1921. A description is given of a save-all consisting of a series of inverted cones the water entering at the center and flowing out over the upper edge. A description is given of the Fullner save-all with special felt washing device sometimes installed on them. A description is given of a device designed by Dietrick for breaking up waste papers. In this paper is blown against rapidly moving knives by means of a current of air.—H. E. W.

K-8. Dyestuffs and Their Relation to the Paper Industry. KENNETH T. KING, **Paper,** xxviii, 16 (June 22, 1921). Outline of the dyestuff situation as it exists in the United States at the present day and of the relation of the manufacturer to the consumer, together with a brief discussion of some of the problems that arise daily in general beater room practice.—A.P.-C.

K-9; K-19. Clay Milk and Colors. JULIUS SCHROETER, **Paper Trade Journal,** August 25, 1921. The Vibrating Machinery Company, Inc., 546 West Jackson Boulevard, Chicago, manufactures a mechanically shaken screen called the "Sandhog" for handling clay milk and colors. The machine has a large capacity considering its small size.— H. E. W.

K-12. High Speed Newsprint Machine.—Paper Mill, xliv. 34.—The Laurentide Company's new machine has has a wire 166" wide and 103" in diameter from which There is no shake. The machine is equipped with a Millspaugh suction couch 30" in diameter from which the paper is lifted by compressed air. The first press is of the suction type with a small granite top roll. The other presses have rubber covered bottom and granite top roll. The machine is equipped with a Harland inter-lock individual motor drive. The couch motor is 125 h.p.; the press motors 90 h.p. each; the three drier motors 125 h.p. each; the calender motor 150 h.p. After the machine has been brought up to speed 375 b.h.p. only are required.—H. E. W.

K-18. Manufacture of Asbestos Board. Anon. **Papeterie,** xliii (June 10, 1921).—Brief description of the process of manufacture of asbestos board. — A. P.-C.

K-23. Paper for Calendar Rolls.—Papierfabrikant, xxxii, 843, 1921. Spurs of paper larger than the proposed roll are mounted on the spindle, the machine direction of each succeeding sheet being a fraction of a revolution ahead of the previous sheet. When all of the sheets are mounted the whole is pressed and turned on the lathe. The furnish is usually wool rags and may be a mixture of linen, cotton and wool. The beating time is two to five hours. The resulting paper must be well felted and be free from shives, sand and other impurities. Good calender roll paper shows a rise of water of 80 to 90 millimeters in ten minutes. Acids or alkalies in the paper under the influence of the high temperature maintained during calendering, cause the surface of the roll to glaze after which small pieces of the glaze break off.—H. E. W.

L-4. Paper Sacks. Spoerl. D. R. P. 328,072 **Papier Zeitung,** xlvi, 81, August 6, 1921. Woven sacks are reinforced by weaving into the sack, woven paper strips. These aid in supporting the contents of the bag and the handles of the bag are made of these strips.—H. E. W.

Q-0. Winter Work on a Quebec Waterpower Development. Engineering News Record, lxxxvi, 26 (June 30, 1921). An article dealing with the methods employed in the construction work on a paper mill power project in northern Quebec and the layout of the plant as a reference for future operations under similar conditions. The dam construction required long hauls over snow roads and special provisions for camp sanitation.

R-6. Offset Printing and Paper Production. W. GRUNEWALD, **Papier Zeitung,** xlvi, 78, July 30, 1921. The author mentions the fundamental facts underlying offset printing, dwelling on the qualities of paper best suited for this work. The use of aluminum and zinc plates in the curved from in the rotary offset press is alluded to. Three quarters of an hour after the text is received for printing the zinc plate is ready and 25,000 to 30,000 impressions may be secured from one plate. A sketch of the rotary offset press (Mann system) is shown. The question of the sizing of paper suitable for this work, is taken up, and also the dusting qualities of the paper. The author enters into the economics of the use of calendered and uncalendered paper for offset work.—H. E. W.

Jackets

Contributed by Schuler and Benninghofen, of Hamilton, Ohio, to the Spanish River News.

The use of jackets in connection with the manufacture of paper did not begin until after the development of the Fourdrinier machine; but since the occasion of the use was due to the method of manufacture as developed by hand work, a brief examination of early methods is interesting.

The first paper of which there is record was made by the Chinese in the second century before Christ. Not until the eight century after Christ was there any movement westward. In that century the Arabs acquired the art from the Chinese.

The trend of civilization was then westward and northward and in the thirteenth century Italy and Spain learned the art. In the fourteenth century Germany had become familiar with the processes, and finally in the sixteenth century England began the manufacture of paper.

Until the nineteenth century all paper was made by hand on a device consisting of a mould with removable deckel or frame. The mould with deckel in position was dipped into a vat containing the prepared pulp in such a manner that only the requisite amount of material was distributed over the mould and then lifted out with a shaking motion, so that the fibres of the pulp became intertwined or felted. The deckel or frame was then removed and the mould handed to a second workman called the coucher, who turned the mould over and pressed it against a felt, thus transferring or couching the pulp in the form of a sheet from the wire or mould to the felt.

In 1798 Louis Robert, a Frenchman, invented a machine for making paper which was afterward developed and improved by two Englishmen named Fourdrinier. The machine subsequently named after these two brothers is essentially the Fourdrinier machine of today. In this connection it is interesting to know that the Fourdrinier brothers, possessors at one time of a considerable fortune, died in want, having expended their fortune in the development of the paper machine.

On the earlier paper machines the sheet was developed on a wire screen which passed over two suction boxes. From the screen the sheet was passed between two couch rolls, and from this point carried along by the various press felts to the dryer or calendar rolls. The couch rolls took their name from the old hand process of couching, and accomplished the act of transferring the paper from the wire to the felt.

In old papermaking practice the pair of couch rolls were jacketed. Later only the top roll was jacketed, and today many machines are operated with neither of the couch rolls jacketed. While the function of the couch rolls is to transfer the paper from the wire to the felt, this cannot be accomplished unless much of the excess water carried over with the sheet is removed. The secondary function of the couch roll is therefore the removal of water thus demanding pressure on a yielding surface. The jacket with which the couch roll is covered supplied the yielding surface. When the formation of the sheet of paper is close and provided coloring matter is not used, it has been discovered that a suction box used in connection with a lower perforated couch roll can effectually accomplish the act of transferring the sheet without jacketing the top couch rolls. Many paper machines making heavier grades of paper, equipped in this manner, are in constant operation.

The jacket must be made of such material, and in such a manner that it will hug the couch roll throughout the life of the cloth. The wool used for making jackets must be carefully selected for felting quality and strength. Briefly, the processes in the mill making the jacket are as follows: grading of wool stock, sorting, scouring, drying, preparing for picker, pickering, carding, spinning, spooling, warping, cop winding, weaving, burling, scouring, fulling, drying, shearing, cutting, stretching, napping and singeing.

While it may be possible to make satisfactory jackets from wools gathered in any particular locality, sixty-three years of experience in the manufacture of paper mill felts and jackets convince us of the importance of gathering materials from all the wool producing countries of the world, and selecting those best suited to the work in hand. In the wool stock from which the yarns used in weaving the jackets, are made, must be represented strength as well as felting quality. It is hardly possible to secure both qualities from any one particular grade of stock, and for this reason careful blending of several grades of wool is required.

The wool is prepared, pickered, carded and spun into rather bulky soft yarns used for the filling, and finer harder threads used for the warp. A warp is next prepared, placed in position in the loom harness, and weaving commenced. Long stock tubes consisting of many plys are woven. Because of the large number of plys, and the fact that the tube is woven round, thus in effect requiring the production on the loom of practically two pieces of many plyed cloth, the operation is very slow.

Usually the tubes are made of sufficient length to make many jackets of the same diameter, and after the desired length is woven, the piece of tube is taken from the loom and carefully examined inch by inch for defects either of weaving or spinning. The examination completed, necessary repairs or adjustments are made, and the piece of tube is next tied together at the extreme ends and sent to the scouring and fulling department, where it is given a scouring preliminary to fulling. Fulling is accomplished usually in a rotary mill and consists of continuously rolling the material between two sets of rolls After a time the direction of operation is reversed in order that even fulling may result. The fulling operation requires many hours of time for each piece, and is probably the most important single process in the manufacture of the jacket.

After the tube is fulled to proper size, it is thoroughly scoured and rinsed. Drying, then shearing, takes place, after which the tube is finished and ready to be cut to size. This done, the jackets are stretched, if stretching is required then napped and singed.

Besides the woven jacket, there is used in Europe a carded, felted and pressed jacket, which has no cloth structure, but is felted directly from the fibre.

In the selection of types of jackets for the paper machine, it is well to remember that regardless of over all thickness, there must be hardness. The jacket when grasped by the hand must be hard. Lacking this prime requisite it will surely fail to perform satisfactorily. After the jacket has been placed on the roll it must hug the roll tightly. If it does not, it will also prove unsatisfactory.

When using jackets on the paper machine, it is well to remember that they should be kept clean. At the end of every week saturate the jacket with a pure soap solution, then clean with a strong stream of water from the machine hose.

Be careful not to permit the ends of the guard board to press too hard against the jacket. If this is permitted, the ends of the jacket are worn out, while the balance is in good order.

PULP AND PAPER NEWS

For several weeks past, and, doubtless, until the actual polling-day, the attention of the country has been largely fixed on fiscal matters. Yet it may be doubted whether the subject of forest conservation is not one which affects the prosperity of Canada almost as closely as the tariff, or any other of the issues now being discussed at such length both from the platform and the press. Such, at any rate, is the view of Mr. Robson Black, secretary of the Canadian Forestry Association, as expressed by him in an address before the Kiwanis Club in Toronto, the other day. He stated —what is, indeed, a notorious fact—that the forest and pulpwood resources of Ontario are in a state of rapid decline, mainly, through forest fires; and he added that one of the best investments that Province could make at present would be to turn back into forest protection and constructive forest management from one half to two-thirds of the total annual revenue of nearly $3,000,000 received from Crown timber lands and operations.

At the same time while Canadian timber wealth is undoubtedly being drawn on too rapidly—too rapidly, that is to say, in proportion to the rate at which it is being attempted to replenish it—her total pulpwood resources, according to a recent estimate made by the Canadian Commission of Conservation amount to 901,000,000 cords of coniferous pulpwood species, added to which there are also large quantities of poplar and jack-pine in all the Provinces which are, to an extent, used in the manufacture of certain papers. The Commission places the supply of spruce and balsam, accessible and inaccessible, in the eastern Provinces—that is to say, in Ontario, Quebec, New Brunswick and Nova Scotia—at 501,000,000 cords. Of the latter amount, 306,000,000 cords, roughly speaking, are actually available. The amount consumption and pulpwood exports from these four Provinces is between 5,000,000 and 6,000,000 cords. But, if only we take warning from the squandering of their pulpwood resources by the United States and other countries, we still have the opportunity intelligently to conserve our valuable possessions of this nature and, at the same time, take a worthy part in the exploitation necessary to supply world requirements.

The Dominion Government has always been aware of the necessity for encouraging tree culture on the Prairie but it was not until 1901 that a really definite and practical scheme for assisting settlers in this work was put into operation. In that year, the first distribution of trees was made under the cooperative scheme of the Forestry Branch of the Interior Department. From a small beginning, the distribution of trees from the nurseries at Indian Head and Sutherland, Sask., has grown until now it averages about 5,000,000 seedlings and cuttings each season, half of which are planted in Saskatchewan and the balance in Manitoba and Alberta. As a consequence of this distribution, there are now found in all parts of these Provinces examples of excellent farm shelter-belts.

Several references have appeared, from time to time, in these columns, relative to the groundwood pulp mill, now in course of erection by the Temiskaming Pulp and Paper Company, of which Mr. Alex. Fasken, K.C., of the firm of Fasken, Robertson, Chadwick and Sedgewick, barristers, of Toronto, is president. This mill is being erected at Dixon Creek, near Haileybury, Ont., and those who have been in the locality recently report that excellent progress is being made with its construction. It is expected that the early spring will see the plant in operation.

The Abitibi Power and Paper Company, Ltd., of Iroquois Falls, Ont., is installing a new wrapping paper machine, which will probably be in operation in a few weeks' time.

As has been pointed out before in these columns, the striking printers of Toronto are displaying quite a phenomenal interest in the present election. Mr. James Simpson, the well-known Socialist, whose advanced views are a matter of common knowledge throughout the length and breadth of the Dominion, has, from the very inception of the printers' strike, distinguished himself by his fervent advocacy of the strikers' cause. He is now a candidate for Parkdale, one of the electoral ridings of Toronto, in the Labor interest, and it is stated in Labor circles that he will receive strong support in his candidature from the Typographical Union.

When Hon. T. W. McGarry, President of the Whalen Pulp and Paper Mills, Ltd., was in Toronto, the other day for a meeting of the directors of that Company, of which he was re-elected President and Mr. W. D. Ross was elected vice-president, he expressed himself very optimistically as regards the situation at the mills. Things are going exceedingly well, "and we are in first-class shape", he said emphatically.

It was announced from Vancouver on Monday of last week that the British Columbia Federationist and A. S. Wells, its publisher, would be committed by Magistrate Shaw for trial in the higher courts of the Province. It is presumed that the charge will be one of "publication of seditious matter." Mr. Wells was recently summoned to the Vancouver police count, at the instance of the police department, in connection with the publication in the Federationist of an article signed by Lenin, president of the Russian Soviet Republic, under the heading, 'Left Wing Communism." The magistrate announced that he was bound to commit Mr. Wells for trial on account of the publication of the article.

A new match manufacturing company is to be formed in Canada. The factory of the concern, in which Maguire, Paterson and Palmer are financially interested, will be at Pembroke, Ont., where the Company just named possesses property, and where a large plant making match splints has been operating for some time.

The Spanish River News, published by the Spanish River Pulp and Paper Mills, Ltd., has been discontinued, owing to the present necessity for rigorous economy, and, in its stead, a series of bulletins on matters of interest to those connected with the Company will be issued from time to time.

UNITED STATES NOTES

With the announcement of $2,000,000 issue of first mortgage 7½ per cent sinking fund bonds by the Continental Paper and Bag Mills came the report last week from the Mid-West that extensive improvements and a large scale expansion scheme are projected in the company's several Western plants. Part of the plans call for the erection of a new paper mill at Oconto Falls, Wis., where water power development is also projected. A new paper machine has been purchased by the company for installation in a new building in course of construction at the Park mills, Marinette. Other extensive improvements, the details of which are now being worked out, will be announced later. The company gave out an announcement stating that it owns at least 500,000 cords of spruce and other pulp wood in the Canadian provinces of Quebec and Ontario. When the new paper machine in the Marinette plant begins operating, the daily capacity of the concern will be increased to 100 tons of fibre, kraft, bag, news and hanging papers. The raw material production will be 55 tons of sulphide and 40 tons of groundwood per day. The development of additional water power at the Ocanto Falls plant will increase the daily paper-making capacity there fully sixty tons. Stock-holders of the concern have been notified of a regular quarterly dividend payment to holders of record on November 15, one and one-half per cent on the common and preferred stock.

Plans of railway executives to cut rail wages, then rates, have the approval of officials of the American Paper and Pulp Association. In a set of resolutions adopted at the third annual fall business conference in Chicago last week, the Association went on record declaring that the transportation problem is vital to national prosperity and the wage reductions are absolutely necessary before freight rates could be cut.

In a statement issued just prior to the opening of the conference sessions, Dr. Hugh P. Baker, executive secretary of the association, expressed the view that American business generally is showing a steady upward trend. "There is not the slightest doubt that conditions are better than they were three months ago," said Dr. Baker, "and the prospect for the future is still brighter."

"In the principal address made during the second day's session, O. M. Porter, secretary of the Woodlands Section, gave the results of a survey of wood on hand and projected operations, which were summarized in our last issue.

R. S. Kellogg, Secretary of the Newsprint Service Bureau, discussed paper importations from Europe. Mr. Kellogg gave figures showing comparative freights between foreign shipping points and American points, as evidence of the conditions confronting the paper industry generally. He pointed out that it will be the publishers who will suffer in the long run, for American mills cannot make paper to meet present European prices, and Europe cannot supply America's permanent needs.

W. J. Raybold, president of the American Paper and Pulp Association, said that he had been receiving reports which indicate that manufacturers have had an increasing business since July. "The paper industry in general has very evidently turned the corner to normalcy," is the way Mr. Raybold summed up the situation. Specific instances showing the trend toward better conditions were cited by Dr. Hugh P. Baker who said that he had received reports telling of 25 per cent production increases in some localities. The high-grade paper industry, according to Dr. Baker's information, now works its employees four days a week instead of three.

The Southern Cotton and Paper Company, recently organized at Chattanooga, Tenn. with a capital stock of $200,000, is getting under way work on a plant and paper mill at Chattanooga which, when completed early next year, will manufacture paper and paper pulp from cotton linters, utilizing a patented process devised by the company's president, Mercer Reynolds, a prominent Chattanooga business man. According to present plans the mill will have a capacity of fifteen tons of paper at the start of operations.

The Associated Industries of Massachusetts, in a recent election, honored a widely known paper executive, George A. Galliver, head of the American Writing Paper Company, by selecting him as one of its three vice-presidents.

The many friends and acquaintances in the paper business of M. E. Battles will miss him now that he has retired as treasurer and general manager of the Union Twine and Paper Company of Cleveland. Mr. Battles' connection with the industry dates from 1891, when he first became associated with the Union Twine and Paper Company. He has served this firm continuously since that time in various capacities Although he is retiring to private life, Mr. Battles will continue as one of the directors of the company.

Several score employees of the Continental groundwood pulp mill at Ogdensburg, N.Y., have been thrown out of work through the closing of the plant. Unsurmountable competition brought about by high freight rates and low prices on imported pulp are given by the management as reasons why operations had to be suspended. The shut down is for an indefinite period. It is explained by the owners, James A. Outterson and Frank A. Augsbury, that pulp is being shipped into New York from Norway and Sweden at a cost of $21 on the docks while it costs $27 a ton to make it at Ogdensburg. The freight rate from Ogdensburg to Carthage is $12 a car load. The Continental mill represents an investment of $375,000. It is a unit of the Ogdensburg Paper Mills, Inc., and was put into operation only a few months ago. The owners express a hope that there may be an early adjustment of transportation rates in addition to a tariff arrangement which will give to American industry a fair chance in the competition with foreign lands.

Attention is the stuff that memory is made of, and memory is accumulated genius.—Lowell.

To become an able man in any profession, there are three things necessary—nature, study, and practice.—Aristotle.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 5th Nov.—At the end of October there was very general agreement among those engaged in the industry, in nearly all its branches, that conditions were decidedly better than they had been at the end of any previous month this year. In part, this is the cause, and, in part, it is the consequence, of greater confidence. Manufacturers are showing this greater confidence by the manner in which they are increasing their percentage of operating capacity. Wholesalers are exhibiting more confidence in placing orders of substantial size. And consumers are displaying more confidence by a greater willingness to take in supplies. This greater confidence, of which one sees evidence all around, has taken a long time to create. One factor, which has prevented its creation earlier has undoubtedly been the question of prices. Time and again, one has been told, with what looked like adamantine decision, that prices were at rock bottom: "Is another drop to be looked for soon?" "No, Sir, the next move in prices will be upwards. I'll tell the world." This has been the line of talk handed out. Then, lo and behold! the very next week, prices have been on the toboggan! Now, however, there does seem real reason to believe that, in practically all lines, there will be no further recession of prices in anything that can fairly be termed the near future. Taking that view, it looks as though consumers, or many of them, had come to the conclusion that price recessions of any substance are now out of the question, and that consequently the path of wisdom for them lies in equipping themselves for the demands of improved business by having reasonable stocks on hand, rather than by continuing to pursue the policy of "hand-to-mouth" buying which they followed for so long this year, merely on the off chance that they may, later, get goods at prices just a shade finer than those now obtaining, and with a distinct risk that prices may advance instead of receding. Further, one is told that there has recently been a distinct diminution of the price-cutting by wholesalers to which attention was directed, some weeks ago, in these columns. All these factors are making for enhanced stability. It is true that the volume of business done so far this year in the paper industry as a whole does not compare favorably with that done in the same period during the last two or three years. But one finds that men of far-sightedness and sagacity are, more and more, taking the view that business is now on a more stable and satisfactory basis than it has been for years. Certainly the general opinion seems to be that a long time of sound and moderately satisfactory business lies ahead. Depression and deflation set in together. Earlier than some businesses, the paper industry encountered both. Earlier, too, than most, and more satisfactorily than many, it is passing from the shade to the sunshine.

PULPWOOD.—Some exceptions to the contrary notwithstanding, the pulpwood situation continues to be remarkably listless. Logging operations, on the whole, are on a decidedly more limited scale, this year, than usual. The mills, for the most part, have comparatively large stocks of pulpwood on hand, and another (and possibly even more effectual) deterrent to entering into contracts for wood for next year is the feeling that it is probable that prices will take a tumble before next spring. This feeling, it may be added, is both widespread and well defined. Next winter, however, it is said that pulpwood operations will be on a much larger scale.

PULP.—The symptoms of improvement in the demand for some grades of pulp, which have been previously noted, have turned out to be indicative of a considerably better market.The reopening of the Riordon Company's Kipawa plant has synchronized with this better demand for the class of products that are turned out by the plant. But, while the demand for strong bleached is better and shows signs of being on the upgrade, that for easy bleaching, at a price at which it can be profitably sold, still leaves a good deal to be desired. The President of the Whalen concern stated in Toronto the other day, that the market for pulp was improving daily.

NEWSPRINT.—Various factors have combined to stimulate the demand for newsprint. The mills—notably Laurentide and Abitibi—are speeding up production, and consumers are becoming alive to the necessity of laying in stocks in larger quantities. Within the last couple of weeks the newsprint situation has taken on a decidedly brighter and brisker aspect. At this time of year, it is not out of the way for the demand for newsprint to slow down. But this year it is not showing much signs of doing so.

BOOK PAPERS.—The market for book papers continues firm. Orders are coming in with a tendency to increase both in number and in size of individual orders. While there is still room for improvement, the general feeling appears to be that prospects are encouraging.

MANUFACTURING STATIONERY.—The improvement, which has been manifested during the last few weeks in the manufacturing stationery situation, still continues. It is expected that an expansion of demand from now on, will be making itself felt.

BOX BOARD.—The box board market is exhibiting much more activity. Mills are running full time, and orders are coming along with gratifying frequency.

WASTE PAPER.—The demand for waste paper generally continues constant in spite of a few fluctuations.

TOILETS AND TISSUES.—The situation in toilets and tissues has undergone no material change. Business in both gives no cause for complaint.

NEW YORK MARKETS.

New York, Nov. 5—(Special Correspondence).—There have been several developments of prime importance in the paper and pulp industry this week. Probably the foremost of these is a sharp advance of a full cent per pound in the price of domestic bleached sulphite arrounced by the leading producers of this kind of sulphite, to become effective December 1. The new price basis will be 5.25 cents per pound f.o.b. pulp mills, which compares with a prevailing price of 4.25 cents.

Which of the several leading domestic manufacturers of bleached sulphite took the lead in advancing quotations is not known, but the fact that the Brown Company, of Portland, Me., which operates the Berlin Mills at Berlin, N.H., together with the Eastern Manufacturing Company, at South Brewer, Me., the Mt. Tom Sulphite Company, of Holyoke, Mass., the Penobscot Chemical Fiber Company, of Orono, Me., and other producers, all announced a rise made the new price basis conclusive as these concerns are the principal manufacturers of bleached sulphite in the country.

Another market change of note has been a further jump in prices on kraft wrapping paper approximating half a cent per pound, making the new basis 7 cents a pound for No. 1 domestic kraft. This advance was not altogether unexpected in the trade. It has been known for some time that a majority of mills making kraft wrappings are sold ahead for the next two or three months, some having their entire output for the balance of the year contracted for. Moreover, unfavable water conditions at many mill centres have caused a considerable curtailment of production, while demand for wrapping paper has consistently broadened, as it usually does during the fall of the year. Then, too, raw material has been advancing, kraft pulp of both foreign and domestic origin having increased in cost to a substantial extent in recent weeks. All of which more or less paved the way for an advance in kraft wrapping paper, making the second rise within a period of eight weeks. On September 1 last there was an increase of half a cent per pound, and the revised price now effective is a full cent per pound above the bottom level reached by the market in August.

The newsprint situation is steady in tone and offers much encouragement to the paper manufacturer and dealer. Consumption is steadily increasing, with the result publishers are taking all the tonnage they have contracted for and are frequently coming into the market to augment their supplies. When the threat of a railroad strike was made some two or three weeks ago, newspaper publishers hurried to place orders with paper mills for additional tonnage of newsprint for quick delivery, it being feared that should the strike go into effect difficulty would be experienced in obtaining the paper needed. Mills therefore were suddenly deluged with orders, and promptly increased their operations to take care of the additional business. When the strike was declared off, there was, as expected, a lot of cancellations, but here the unexpected happened. Newsprint manufacturers looked for practically all the extra orders placed by publishers to be cancelled, but, according to a high authority in the trade, not more than 50 per cent of these orders were cancelled, and further buying by other publishers almost immediately afterward because of increased paper requirements easily offset the cancellations, thus leaving mills with fully as much business on their books as before.

Spot prices on newsprint in standard rolls range from 4 to 4.25 cents per pound at mills. Most of the transient trade is going through at the higher figure, though manufacturers are said to be accepting orders for sizeable tonnage at the low price, which is the same publishers are paying on contract deliveries. According to News Print Service Bureau figures, production of newsprint by United States mills during the nine months of this year to September 30 was 24 per cent less than in the corresponding period of 1920. Canadian production was 12 per cent less than a year ago, or an average of 19 per cent less for 44 companies reporting in the States and across the border.

There is still much talk in the trade regarding large supplies of cheap German newsprint, yet offerings are of light tonnage and everything would seem to show that the reputed large supplies from this source are more fiction than fact. Reported offerings of paper from abroad at less than 3 cents a pound are not taken seriously in the trade. Some German newsprint is known to have sold well above 3 cents recently, and it is authoritatively stated that the bulk of foreign newsprint being marketed here is bringing better than 3.50 cents. According to figures just at hand, Germany exported only 25,413 tons of newsprint to the United States during the first eight months of this year. This quantity is but a drop in the bucket of the total tonnage consumed by American publishers.

Book papers have quieted down to an extent after enjoying several weeks of brisk demand. Prices are holding, however. Tissues are steady and are moving in comparatively good amounts. Fine papers are improving their market position in a consistent manner, and obviously the sharp advance in sulphite prices this week has had a strengthening effect on sulphite bond and ledger papers. There is less doing in plain box boards. Folding box boards and corrugating boards are in increasing call, but set-up paper box manufacturers have diminished their buying, with the result news and chip boards are moving in smaller amounts. No change is reported in quotations.

GROUND WOOD.—Mechanical wood pulp rules steady in price and is moving into consuming channels in consistently good volume. The market, however, is bare of feature aside from the firmness noted in quotations. Producers appear to be finding a ready outlet for practicaly all the pulp they have to sell, and consequently are not inclined to consider granting price concesions, particularly since many of them are having much difficulty in operating because of low water. Around $30 per ton at grinding plants is the price generally quoted, with some sales being accomplished at higher prices in cases where the consuming mill is situated cose to the grinding plant and a low freight rate is involved.

CHEMICAL PULP.—The advance of a full cent per pound in bleached sulphite prices by leading domestic producers is of course the outstanding development of the week in chemical wood pulp. There is no question that the advance caught the pulp trade unawares; that is, while many expected bleached sulphite was due for an advance, few or none looked for prices to be jumped as much as a cent per pound. The revised price basis is not effective until December 1, so that dealers and mill agents are given an opportunity to prepare for the change.

There has been little or no actual change in other grades of chemical pulp. Of course the advance in bleached sulphite has served to stiffen quotations on all grades, and the market tone is exceedingly firm, with buyers finding it necessary to pay full quoted figures to obtain supplies. Kraft is moving in steady fashion and at well sustained prices. Domestic kraft of strictly No. 1 grade is bringing up to 3 cents per pound at pulp mills, while secondary grades are selling at around 2.75 cents. Scandinavian kraft is quoted on a broad range of from 2.50 to 3 cents, depending on the quality of the individual lot concerned and the tonnage involved as wel as the position of the pulp. For example, spot lots



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RAGS.—Paper mills are absorbing rags in rather limited volume. There is a steady demand for several grades, notably roofing stock and old white rags, but on the whole buying is of hand-to-mouth variety with the average order calling for small amount of rags Nevertheless prices are firm, and there is a surprising lack of selling pressure. Dealers claim to have less than normal stocks on hand and say there is no incentive for them to grant price concessions because they replenish stocks at lower costs.

No. 1 roofing rags are selling at around 1.25 cents a pound f.o.b. New York, and No. 2 packing at an average price of 1.15 cents. Old repacked No. 1 whites are bringing from 6 cents upward at shipping points, No. 2 repacked around 3.50 cents, and street soiled whites between 1.65 and 1.75 cents. New white shirt cuttings are very strongly held, with sales to mills in the Holyoke vicinity reported at 11 to 11.50 cents per pound delivered for No. 1 quality cuttings. There is a fairly good demand for new unbleached muslins, which are quoted at 9 cents at shipping points; for new light silesias, which are bringing 7 cents, and new white lawns, for which dealers ask 8.75 cents. Old thirds and blues are quiet, with repacked blues at 2 to 2.25 cents a pound at shipping points.

PAPER STOCK.—Old papers are finding a fairly ready sale and prices are holding up well. Several grades have slowed up during the past few days, this being attributed to the withdrawal of western paper and board mills from the eastern market, but packers continue to name the same quotations and seem to feel that demand will soon revive. Old folded newspapers are moving freely at 65 to 70 cents per hundred pounds f.o.b. New York, as is No. 1 mixed paper at 55 to 60 cents. Old kraft paper is selling at 2.25 cents a pound New York, white blank news cuttings at 1.90 cents. ledger stock at 1.70 cents and print manilas at 1.05 cents. Shavings are quieter and so are books and magazines.

OLD ROPE AND BAGGING.—Demand for old rope appears to be constantly increasing, and sales to paper mills at 4.75 cents a pound at shipping points have been reported, with some talk heard of 5 cents being paid. Old bagging is moving in scattered directions, and, in the aggregate, in small volume at last reported prices.

No use to wait for our ship to come in unless we have sent one out.

EVEN SLIGHT ACCIDENTS VERY COSTLY.

An accident is a bad business at any time, but especially so in slack times like the present.

Most men find it hard enough to get on under present conditions without losing more time through accidents. It does not make much difference whether the acident is slight or serious. There is a big loss of time and money for even the slightest accident.

A slightly bruised index finger caused the loss of three whole working days and took $20.64 out of the pay envelope. Burnt fingers lost 32 hours and $15.36 for another man. A strained right hand cost the loss of 40 hours and $24.40. So an accident, no matter how slight, is far too dear at the price. No one would think of buying one, yet a second's carelessness is the purchase price, and eight men paid it during the month of September

With all the industries in Canada fighting for their lives, with overtime cut out, in some cases on short time, with staffs and rews reduced to the minimum, and the pay envelopes lighter than for some time, the carelessness which causes an accident is criminal.

Any pay envelope minus $15.00 or $20.00 is a pretty light lift for an able-bodied man, and is a mighty poor thing to take home to a wife and children.

"Eternal vigilance is the price of safety," is just as true of the men in the mill as it is of nations in the world game.

Add loss of time due to an accident to short time, and where does a man get off at? It is absolutely imperative for every man no matter what his position, to see to it that he plays safe himself and that those around him play safe also.—Broke Hustler.

Shall I go over the top?" asked the talkative barber, poising his scissors.

"Yes, as soon as your gas attack is over," answered the weary customer.

Generally, downright facts may be told in a plain way; and we want downright facts at the present, more than anything else.—Ruskin.

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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., November 17, 1921. No. 46

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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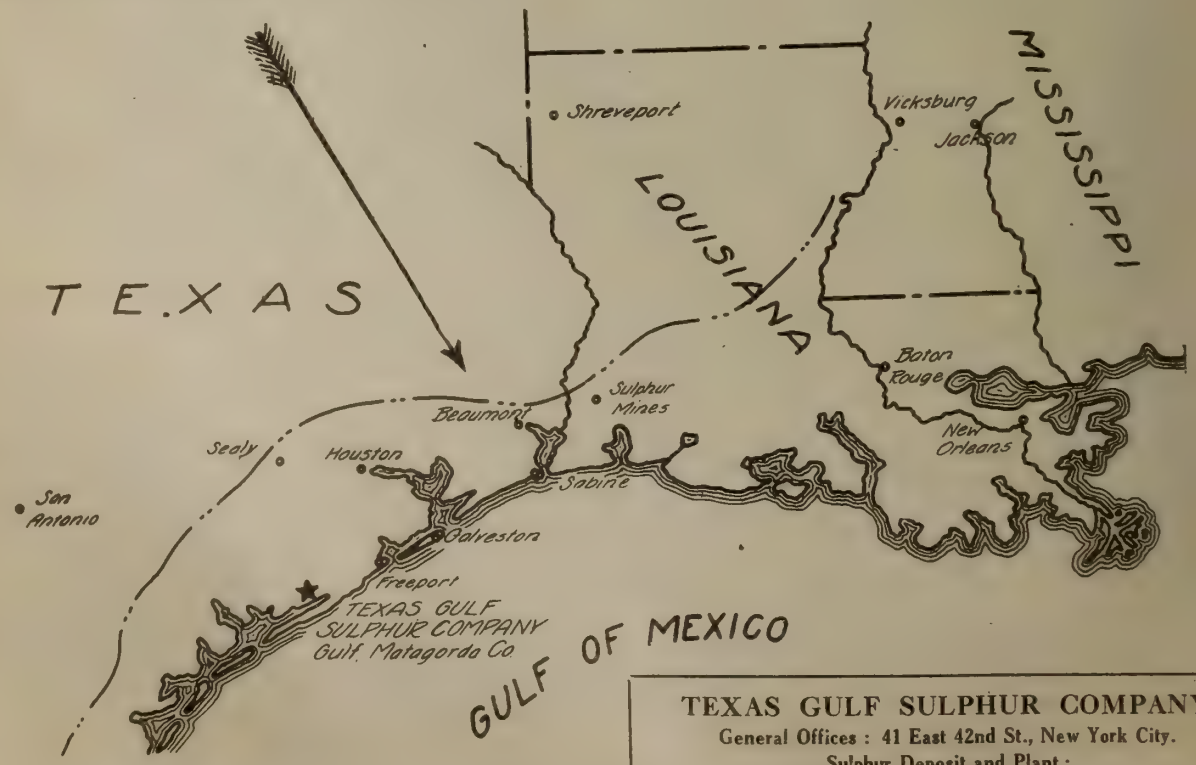
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EDITORIAL

THE WASHINGTON CONFERENCE.

Before this issue reaches our readers, it is quite probable that the conference in Washington will have arrived at some definite agreement on the matter of disarmament. The Secretary of State of the United States has given the proceedings a great impetus in the manner in which the conference was opened and by the immediate proposal of a definite and an apparently workable scheme. Certainly the world has been astonished and greatly cheered by the immediate proposal to reduce naval armament and expenditure for further building and to do it *now*. No doubt the emphasis which Mr. Hughes put on that word "now" is the most important feature of the proposal and one which will cheer the hearts of millions the world over.

There is always some "Gloomy Gus" to cast a shadow and perhaps such individuals are of some use in the world. The point which they seem to emphasize just now is the likelihood of causing industrial depression in the world's great ship building centres where heretofore there has always been great activity in the construction of war vessels. This feature need cause no great concern because we have seen with what facility enormous organizations, built up purely for the manufacture of military equipment, have been converted to efficient manufactories of articles of peace and there is no doubt but that ship yards, if not all required for building commercial shipping, could undertake the construction of steel work of an industrial character. It may seem that the amount of taxes that each worker in naval ship building will be relieved of will not go very far towards paying his bills but when it is remembered that his relief is multiplied by millions through the similar relief to his fellow citizens, there will be no question in his mind but that the great increase in purchasing power of the nations of the world will soon find plenty of work for all hands and an increased demand the world over for the products of peace. It is this phase of the situation which should be borne in mind by Canadians when they think of the effect of naval disarmament on the products of Canadian industry. An improvement in purchasing power the world over will result from disarmament and will greatly increase the demand for Canadian goods.

THE NEW SECRETARY.

The success of an association is probably more dependent upon the selection of a suitable secretary than any other one factor. No matter how carefully the policy of an association is formulated and expressed, no matter how great the advantages to members from their opportunity of co-operation, no matter how prominent the president and the other officers, it is upon the secretary that the association must depend for the important work of maintaining enthusiasm, projecting plans of activity and accomplishing that most important function, namely, maintaining contact between the association and the public. The Canadian Pulp and Paper Association has been most fortunate in the character of the men who have filled the important position of secretary.

Because of the intimate association between the Pulp and Paper Magazine and the Pulp and Paper Association, especially during the early part of the latter's existence, it will be appropriate to mention a few points connected with the formation of this organization.

In 1912 Mr. A. G. McIntyre undertook the work of editing the Pulp and Paper Magazine and almost immediately there developed a movement for the formation of the Forest Products Laboratories of Canada somewhat on the basis of the organization and work done at Madison, Wis. Because of Mr. McIntyre's ability and experience, his services were sought by the Department of the Interior, as director of the laboratories. An arrangement was made whereby the publishers brought the work of printing the Pulp and Paper Magazine to Montreal in order that Mr. McIntyre could occupy the dual position of editor of the magazine and director of the laboratories. This was early in 1913. In the spring of that year, the feeling began to grow among pulp and paper men that they should be organized. This desire was fostered by the Pulp and Paper Magazine and a meeting was called in Montreal which resulted in a committee to draw up plans for an organization along the lines of the Association of mill owners such as had been in existence in the United States for about thirty years, although there were some who had hopes of an association which should include more of the operating officials. It will be seen that this latter feature was largely met by the organization in February 1915, of the Technical Section of the Association.

Because of his enthusiastic efforts with regard to the formation of the Association and his other positions which brought him in close contact with all branches of the industry, Mr. McIntyre was selected as the first secretary and the first annual meeting was held early in 1914. Mr. McIntyre was succeeded at the Forest Products Laboratories by Dr. John S. Bates who has always taken a keen interest in the work of the Association, particularly in the Technical Section, and when Mr. McIntyre resigned as secretary and editor towards the end of 1914, Mr. Roy L. Campbell took on the duties

pertaining to both these offices and continued in the effective discharge thereof until 1916.

During these first years of the Association, the Pulp and Paper Magazine was published twice a month. Beginning with 1917, however, the magazine became a weekly publication and, on account of the necessarily heavier work thus attaching to the editorship, and because, at the same time, the work of the Association had very largely increased, it seemed inadvisable further to continue the combination of the two offices. As a successor to Mr. Campbell, Mr. Arthur L. Dawe was chosen. Until that time Mr. Dawe was not widely known among the pulp and paper men but had established an enviable record for efficiency and reliability in the various positions that he had held. As a member of the staff of Edward Lloyd, Ltd., Paper Makers, England, and Canadian manager for the same concern for several years, as well as in his position as sales manager for the Federal Paper Company, Montreal, Mr. Dawe obtained a first hand knowledge of paper and its distribution which has been a great asset not only to himself but to the association. But the secretaryship of the Pulp and Paper Association has always been a step towards greater responsibility and larger opportunities for service, so, in the course of events, it has just been announced that Mr. Dawe has resigned as secretary to accept an important position with the Canadian Export Paper Company. No one regrets the altered atmosphere of the association office due to the absence of the cheerful, friendly, enthusiastic personality of Mr. Dawe, more than the editor and no one is more pleased than he at the choice of the Executive of the Association in selecting Mr. Edward Beck to occupy the position of secretary and manager of the Canadian Pulp and Paper Association.

Mr. Beck has been for sometime in close contact with the affairs of the Association through his work as publicity manager and through his discharge of the secretary's duties during the absence of Mr. Dawe in England for several months in 1920. The association work, in fact, association work in general, is now entering a phase in the development of the association idea which makes it most appropriate that a man of Mr. Beck's qualifications should undertake the secretary's duties and it is certainly fortunate that such a man as he is available for the position. Mr. Beck is an experienced journalist, a ready writer, and a clear thinker who is able to formulate a policy, to develop arguments, and to present a proposition with convincing clearness. There is no doubt but that Mr. Beck is just the man for the position at this time. It is with the greatest pleasure therefor, that we extend to Mr. Beck our hearty congratulations on his appointment and offer him every kind of assistance which can be rendered personally or through the columns of the Pulp and Paper Magazine. At the same time we wish also to express our gratitude and appreciation to Mr. Dawe for the unfailing and unceasing courtesy and help which he has always extended to the Pulp and Paper Magazine. We wish him every success in his new work.

THE EAGLE EYE OF THE FOREST AIRPLANE.

The use of airplanes in forest protective work is bringing to light some valuable features that had not been anticipated. Most forest fires are caused by the carelessness of human beings. If prospectors, hunters, campers, fishermen, and others who go into the woods for business or pleasure could be educated to be always careful with their camp fires, their matches, and their cigarette stubs over half the load would be lifted from the shoulders of the fire fighters. This is the reason why the fire warning poster is probably the most important single factor in forest protection. And here comes in a little psychology in which the airplane figures. When a man camps at a place where a warning against the careless use of fire is conspicuously posted he is careful to put out his fire, but when he camps at a spot where he seems to be outside of the range of human touch or observation, he is apt to grow careless and fires are likely to follow in his trail. One of the Dominion Forestry Branch inspectors, in reporting on his first week's experience in observation from an airplane, records this fact that men camping in the woods or out from the city for a few days or a week-end are suddenly and effectively reminded of what they ought to do by the appearance of an airplane high above them, attending strictly to its business of patrolling the forest. This impression is deepened when the men realize that they and their camp have been seen from the airplane. Of this they are certain, when they see a message fluttering down to them through the air. They naturally watch where the paper falls and, if possible, get it. They find it a message reminding them that as citizens of Canada, they should assist the Forestry Branch and the Air Board in protecting their own property—the forest—by being careful with fire. As preventing fires is much more economical and effective than fighting fires, this feature of airplane patrol is of great importance.

MR. CLARK'S HALF CENTURY AS EDITOR.

Fifty years is a long period of service for a man to put in on one newspaper in view of the frequent changes in ownership and management that take place in these hustling days. Those journalists who have such a record are few in number and are not increasing very rapidly as the years go by.

One of them is Charles Hopkins Clark, editor of the Hartford Courant, which was established as the Connecticut Courant in 1764 and is said to be the oldest morning American newspaper. On Sunday Mr. Clark completed his fiftieth year with that publication. He has been and still is, one of the bright and shining lights in the journalistic firmament of New England. Possessed of a keen, analytical mind, an intimate knowledge of the political history of the country and of its institutions and ideals, and having a firm belief in the future possiblities of our nation, Mr. Clark has won for himself a high place in the confidence of the great public whom he delights to serve.—Editor and Publisher.

Speaking of the "silent agitator"—it is sometimes much better to remain silent and be thought a fool, than to speak and forever remove the doubt.

Engineering as Related to the Pulp & Paper Industry

By H. S. TAYLOR, Chief Engineer, H. S. Taylor Limited, Montreal, Quebec.

Editors Note:—Some time ago the Pulp and Paper Magazine arranged with Mr. H. S. Taylor for an article on the planning of a pulp and paper mill. We are fortunate in being able to announce that other members of the staff of H. S. Taylor Limited, who have designed and installed several successful Canadian plants, have agreed to contribute to what will now be a series of articles on this subject. Mr. Taylor himself contributes the first article, which sets forth the fundamentals of paper mill engineering, and is presented at an appropriate time, because winter is the time for the making and planning, so that actual work may progress most efficiently. The engineer "thinks with a pencil."

In the earliest history of civilization certain lines of human endeavor were recognized as essential to the community, and as civilization began its onward march it soon became evident that a certain line of endeavor always proceeded this onward march, blazing the trail of progress by its own creations. These certain lines of human endeavor remain in the same relation to progress as they were in the beginning, but today they are called professions, each profession with its many branches following its special subject more and more closely to this the day of specialization.

Of the many professions, engineering is perhaps one of the broadest, its followers being found in all parts of the globe, engaged in the many different fields of work that come within its scope. As new discoveries were made and perfected to commercial use, the three original classifications of engineering have subdivided until we now have a score of recognized branches, each branch specializing in its own field, and in addition to these universally recognized branches, the basic industries now recognize lines of engineering that are in reality made up of two or more of what we might call the standard lines, for the purpose of specializing on the entire detail of their own special requirements.

The so-called pulp and paper mill engineer can be included in this latter class. Pulp and Paper Making is today one of the basic industries. Its mills can be found in all parts of the civilized world, and while there is an ever increasing demand for paper and its products, competition is becoming stronger and stronger, demanding constantly improved equipment and methods of operation, combined with increased volume of production. Such improvement demands that the installation be carefully planned throughout, the equipment selected and installed so that operation can be carried on with a minimum of maintenance and attending labor, and buildings so laid out and constructed that they will be efficient and permanent, and that the several departments entering into the completed unit be properly balanced that operating costs can be kept at a minimum, from the preparation of the raw product to the shipment of the finished sheet.

Pulp and Paper Mill Engineers can play a most important part in the development of a modern paper mill. The development of a complete paper mill unit, especially if it be of large production, is an extremely important undertaking. The location of the proposed development is often in yet undeveloped country where the limits of location are of wide range, water power of considerable volume must be developed, to fill the power demand, of which a considerable part must be electric energy; a steam boiler plant must be a part of the completed unit, and the paper mill itself together with Groundwood and Sulphite Mills complete the major part of the complete unit. In addition, the handling of raw products is a most important factor, and modern equipment for conveying, sawing and preparing the wood supply, handling and conveying coal, sulphur and limestone, and the handling, storing and shipping of finished product must all be included. The investment for such a plant runs into millions of dollars, and the installation is unlike that of any other industry, the paper mill equipment itself being to a great degree special, and the many different operations each requiring its own special complement of buildings and equipment, and yet each operation must combine efficiently with its neighbor, so that the complete process may be uniform and uninterrupted throughout.

Compared with the total number of pulp and paper making plants of the industry, complete units as before described are, of course, few. We find a groundwood mill here, a sulphite mill there, and the paper mill, or conversion plant as it might be called, in almost every section of the country. Soda and sulphate pulp mills are numerous in locations where the wood supply is favorable, and board mills are common to more thickly populated centers where their main raw product, old papers, is closely at hand. Each one of these separate mills, however, has its special problems from the time of its inception to its completion, and, for that matter, as long as it may operate. The magnitude of these problems is, in the majority of installations in proportion to their size, demanding a corresponding degree of experience and knowledge on the part of those retained to solve them.

As in any creation that is first conceived in the brain and then constructed by the body, the old saying "A good start makes a good ending" is applicable, but it is especially adaptable in an industrial installation, the layout of which is really a most important factor and may, if properly made up, insure the success of the undertaking, and in turn if hastily drawn up, through either lack of experience or knowledge, or through what is most common, lack of time, may show faults that if followed will detract from the success of the undertaking throughout its entire future. A poor layout is often discovered, but this discovery comes at such a late date that it is either necessary to proceed, knowing that what is being done is not as it should be, or requiring radical changes that add greatly to the expenditure and the date set for completion, which is often a vital factor.

Those responsible for the layout must have to the greatest degree experience and knowledge of the completed installation. They must see clearly in their minds the completed mill in operation. They must also see clearly and allow for extensions to each department for future enlargement of the development, for it is the future of any undertaking that determines whether it be a success or a failure, and without the future requirements as well as the requirements of the immediate development in mind, a layout that proves to be a success is accidental, and those responsible for it should rest on their laurels, and take no chance of repetition.

To hold clearly in mind a completed installation especially of the magnitude of the modern paper mill unit, at the time of its inception, it can be clearly seen that training is required. This training must be made up of, first, and perhaps the most important, experience in the requirements of this special work, including a complete knowledge of each process that is to be carried out. This training must include structural knowledge for the special structures themselves, mechanical training for the special equipment and steam requirements, and electrical training for electrical demands that are becoming more and more important in the modern practice of complete electrification. In other words the one to meet such demands must be an engineer trained in those departments that are included in this special pulp and paper mill work, and in addition to his engineering training, he must be familiar with each process of operation. An engineer, with engineering training only, while he might carry out any part of the design and installation, could not put together a design that would insure efficient operation without a complete understanding of the operation itself, and the man who has specialized in this work can rightly call himself a pulp and paper "Operating Engineer."

Those responsible for the carrying out of any industrial development would be characterized as exceedingly poor executives should they fail to insure their workmen and all parts of their structures during their construction and thereafter. The selection of engineers trained in their special work is just as much a form of insurance as that representing fire, workman's risk, or occupancy, for from the commencement of preliminary work such as surveys, accumulation of power data, location of railroad spurs, transmission lines, and the many other details leading up to the actual selection of site and final layout, the trained pulp and paper engineer carries the future always in mind and each act performed is subconsciously valued in terms of tons per day output of the finished plant.

The preliminary work while often thought of as a somewhat needless expenditure of time and money, is in reality of great importance, as it is the actual recording of the physical conditions on which depends the location of all parts of the development, the amount of power available, and characteristics of the entire power installation, the design of foundations, and many other such details. In fact in a number of instances carefully executed preliminary work has prevented extensive delays and large expenditures, by showing clearly in advance the action necessary to overcome certain abnormal conditions, that otherwise would have remained unknown until actually encountered in the progress of the work, and it is this encountering of the unusual in any undertaking, whether large or small, that plays havoc with the entire development no matter how carefully the work has been laid out. Too much preliminary work is far better than not enough, and the true paper mill engineer realizing that both his future and that of the development may depend on preparedness, is often thought either too conscientious or simply putting in time, when a certain period elapses without an actual sign of real progress.

The layout is the last step of the preliminary work, and is an assembly showing the outlines of the completed development, each structure or part thereof in relation to its neighbor, and as the greatest care is taken in the selection of the seed to insure the future of any form of life, or in the making of a pattern from which the completed work is to be fashioned, so should the greatest care be taken in the forming of the layout, as it is the seed from which the completed plant must grow, first foundations, then superstructures, then equipment and finally the completed whole. The layout is the commencement, and if in it is incorporated an arrangement that has taken into consideration all future requirements, the real detail, that is the bulk of the work as regards time and numbers engaged is greatly simplified, the many different structures being detailed, either the whole or a part at a time, this work expanding steadily until at completion the one or two layout drawings have grown into a number of finished working drawings, the actual number depending on the extent of the development. While on many of these drawings the major part of the design is one of structural problems only, there must be ever present in the mind of the engineer the primary object of the structure he is planning, viz, a part of a pulp and paper mill. The design must first, therefore, be arranged for the most efficient installation of equipment, and operation thereof, and structural details then perfected for this arrangement.

If the design be carried out without this primary object in view, the result while it may be structurally perfect, will in the majority of cases show evidence that a true realization of the purposes for which the buildings were intended was lacking. Equipment is cramped in one place and extended in another, extra labor is demanded due to special handling of product that should have been avoided, costs in one department or another are exceedingly high due to lack of balance, power demand is either excessive or output lacking to fill a legitimate demand, and if such conditions occur it is generally found true that a considerable period was expended in putting this development into operation, with the always present feeling of dissatisfaction on the part of the owners and discouragement on the part of the operators. Such conditions are rarely found where the work is carried out by experienced pulp and paper mill engineers, as it is a part of their everyday routine to see that such conditions are avoided, and that an efficient operating installation is turned over at the completion of their work.

While careful office and detail work, both on preliminary requirements as well as on the future work, should insure a well planned installation, the actual construction of the development, if improperly carried out may go a long ways to offset the most carefully prepared design, and among other requirements of the pulp and paper mill engineer must therefore be the ability to properly supervise the actual construction work. If the plans of the work are complete to the last detail, a supervising engineer without previous paper mill experience, provided his general experience is extensive, can, by following drawings closely, insure proper results. A supervising engineer, however, who has gained his experience in pulp and paper mill work is in command of the situation much more thoroughly. He knows where to do the work, and what work is to be done, to the best advantage, and has at his finger tips all the little tricks of the trade, so to speak, that go to insure a quick and accurate installation, whether it be the setting of a plate here or an anchor bolt for some piece of special equipment there, and supervision of construction on his own special installation is a necessary part of the pulp and paper mill engineer's training.

The reader will no doubt realize by this time that the pulp and paper mill engineer, as described to some extent, represents in actual practice an organization, the members of which, while being familiar with the entire requirements, specialize on one or more parts thereof, and if this organization is properly balanced, we have a unit experienced in the entire detail that has been char-

acterized in this article as the "Paper Mill Engineer." Such an organization is equipped to handle the smallest detail as well as those required to complete a maximum development. The demand made upon it is in direct proportion to the volume of the requirements, and the expense to the one making the demand will be in similar proportion. This is a true statement, and may to some extent offset the general impression, namely; that the expense would be far greater in proportion for a small job than it would be for large work, therefore the common saying "in any case I will do the small work myself".

There is no doubt that engineering costs money, and because it does cost money it is often dispensed with entirely, or only those requirements covered that are absolutely necessary. While engineering costs money, it is not expensive, in fact the nominal expenditure required is in many undertakings returned many times over through the care exercised in carrying out each part of the work in a minimum of time and of expenditure, and the commencement of operation at the time set. The plant that through delays here and there sets forward the time of completion, and through something missing here and through changes required there, must spend a much longer period than necessary in producing a salable product, finds when it is too late that there has been expended many times the fee that would have secured a competent engineer, specializing in this work, who would have carried it through to completion and turned it over as an operating unit. The cost of such engineering service, is in comparison with the investment, a very small proportion, and in these days of constantly improved methods of design and operation, no industry can afford to carry out even their small undertakings without engineering experience, specialized in its own particular industry.

MUST MAKE ONTARIO TIMBER A CROP.

In speaking at a mass meeting of citizens at Cochrane recently, Premier Drury said:

The North Country has tremendous possibilities. The Government can do much, but it cannot do everything. It must have the co-operation of the people. We have here immense agricultural possibilities, but we have also great forests, and huge areas which are not suited to agriculture, but which are well suited to the growing of forests. The real prosperity of the north must depend absolutely on the permanency of her forests. Great as agriculture will come to be, the base of northern prosperity must be used as a periodical crop and harvested so as not to interfere with the growing crops. That means fire protection, which in turn means that the Government must have absolute co-operation on the part of the settlers and of the large industries.

Speaking of the extension of the T. & N. O. he said that it was a sound business proposition. The railroad would open up large agricultural areas and large pulp wood areas, and there was every prospect of the development of valuable mining properties. The Government wished the railroad to be self-contained and self-supporting, and from the results of the building of the railroad from North Bay to Cochrane the Government was absolutely convinced that the road from Cochrane north to James Bay would round out the system to make it self-supporting and at the same time to the greatest feature in the opening up and development of the great north country. He saw room for two pulp mills, perhaps three, with absolutely certain agricultural prosperity, and a possible large development of mining areas. He suggested also that the development of the North had reached a period where further steps would have to be taken and hinted that with a population of a hundred thousand between Cobalt and Cochrane, the time was very close at hand when county organization—at least in the stretches along the railway, would have to be considered. This, however, was a matter for the people themselves.

H. E. HOWE SUCCEEDS C. H. HERTY ON J.I.E.C.

New York, Nov. 7th.—Mr. Harrison E. Howe, it was announced to-day, has been elected to succeed Dr. Charles H. Herty as editor of the Journal of Industrial and Engineering Chemistry and director of the A.C.S. News Service, which are conducted by the American Chemical Society. Dr. Charles L. Parsons, of Washington, secretary of the Society, stated that Mr. Howe had accepted both positions.

Mr. Howe, who is a well-known industrial chemist, was born in Georgetown, Kentucky. He was graduated from Earlham College, Richmond, Indiana, with the degree of Bachelor of Science. He was a graduate student of the University of Michigan and became a Master of Science at the University of Rochester. As chief chemist of the Sanilac Sugar Refining Company, in like capacity with the Bausch and Lomb Optical Company of Rochester, New York, and as manager of the commercial department of A. D. Little, Incorporated, of Boston, and Manager of the Montreal offices of that organization, he became familiar with the broadest phases of industrial chemistry. In the World War he was consulting chemist of the Nitrate Division of the Ordnance Bureau of the United States Army. Until his election to his present position Mr. Howe was at the head of the Division of Research Extension of the National Research Council. The new editor writes extensively for magazines on applied chemistry and has done notable work in the popularization of science. He is the author of a recently published popular work, "The New Stone Age."

Dr. Herty resigned the editorship to which Mr. Howe succeeds, to accept the presidency of the newly formed Synthetic Organic Chemical Manufacturers

Dr. Herty resigned the editorship to which Mr. Howe succeeds to accept the presidency of the newly formed Synthetic Organic Chemical Manufacturers Association of the United States, which to-day opened offices on the 34th floor of the Metropolitan Tower at No. 1 Madison Avenue. Dr. Herty's career in chemical journalism has been varied by many public activities. By special appointment of President Wilson he went to Paris in 1919 as the representative of the United States in the matter of the distribution of German dyestuffs under the economic clauses of the Peace Treaty. Dr. Herty was also chairman of the Committee of the American Chemical Society advisory to the Chemical Warfare Service, member of the Dye Advisory Committee of the Department of State, and Chairman of the Advisory Committee of the National Exposition of Chemical Industries. Before beginning his public work, Dr. Herty had been a professor in chemistry both at the University of Georgia and at the University of North Carolina. In his new position he will devote himself to the development of American synthetic organic chemical industry.

Judge not thy neighbour until thou art in his situation.

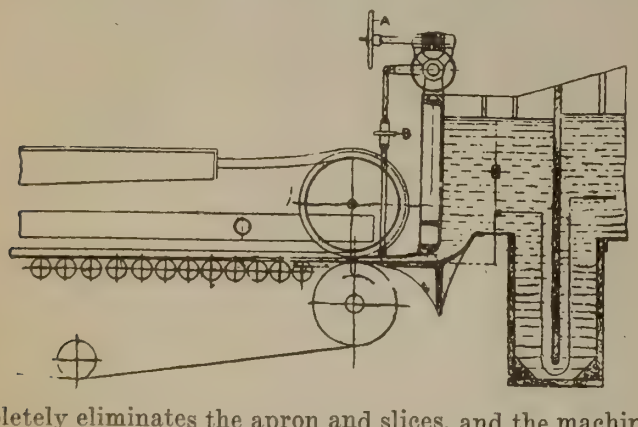
A NEW TYPE OF PAPERMACHINE FLOW BOX.

(Translated for the Pulp & Paper Magazine from La Papeterie, **42**, 72, January 25, 1920, by A.P.-C.)

As a rule, stock is made to pass from the flow box of the papermachine to the wire over an apron, the amount of flow being regulated by the slices, the functions of which are to hold back the foam and to ensure a uniform thickness of stock over the whole width of the wire. One end of the apron is attached to the frame and to the flow box, while the other rests on the wire over the breast roll against which it continually presses owing to its own weight and the weight of the stock flowing over it. As the wire travels at a high speed, the apron is subject to considerable wear. Moreover, a felt or oilcloth joint must be provided between the frame and each side of the apron, which increase the wear on the wire, unless they be very carefully made, and which must be changed each time the wire is changed.

With the above-mentioned style of flow box, in which the height of the stock is relatively small, the stock cannot flow past the slices at more than 100 to 130 m. per minute (about 333 to 433 ft. per minute), so that in the case of machine working much faster than this the speed of the wire is greater than that of the stock, which prevents proper felting of the fibers. To overcome this difficulty the Eibel-Martin patent provides for a rather considerable inclination of the wire towards the wet presses, and as the inclination must vary according to the speed, the height of the end of the wire must be adjustable.

The J. M. Voith Company, of Heidenheim (Germany) has devised the flow box shown in the cut. It completely eliminates the apron and slices, and the machine can be run at a high speed without giving the wire any great slope. It has already given satisfactory results under actual service conditions.



The stock is delivered through a nozzle which slides out of the flow box and is absolutely independent of the wire, the only parts resting on the latter being the deckle-straps. The height of the partition in the flow box can be very easily adjusted, thereby adapting the rate of flow of the stock to the speed of the wire, so that it is unnecessary to change the slope of the latter while the machine is running.

A further advantage of the new box is that the thickness of stock flowing through the nozzle can be adjusted by means of 10 or 20 levers B, spaced along the whole width of the sheet.

The bronze cross-piece which in most machines is placed between the breast roll and the first table roll is also done away with, thereby eliminating a further source of wear on the wire. By suppressing the slices, the formation of air bubbles and foam spots on the wire is prevented. Thus the output of the machine is improved as regards both quantity and quality.

LOOKING AHEAD.

(By Col J. D. DENNIS, of the Canadian Pacific Ry.)

Canada's economic future, both immediate and remote, depends entirely upon a healthy and adequate introduction of people and capital—people to accomplish the settlement of vast tracts of virgin agricultural land, capital to make possible a corresponding industrial development. In the sure, steady flow of these two tributary streams lies Canada's hope of greatness. It is the absolute fundamental growth to equality of national status. The Dominion now stands where stood the United States a century ago. Given a sane, sound immigration policy and the promised continuation of the flow of foreign capital to exploit her natural resources and build up her industries, her future is mirrored in the century's history of the United States development.

Industrially Canada is prospering. The total United States investment in Canada at present is estimated at about $1,600,000,000, and that of Great Britain approximately double this. The war, which tended to keep British capital at home, offered particularly advantageous conditions to United States investment, so that while the flow of capital from overseas almost ceased and is still sluggish, the effect of its withdrawal is being counteracted by the influx of United States moneys. The are some 500 branch factories of United States firms in Canada at present, of which more than 300 have been established since the war, an example of the evil of a depreciated currency working for the benefit of the Dominion. This has awakened United States manufacturers to the many other advantages of locating in Canada, so that even should the exchange situation become righted in the near future, there is no danger of Canada losing favor with United States manufacturers. The future, I think, is really bright for Canadian industry.

Never were immigration prospects brighter or eyes turned more favorably or in greater numbers upon Canada as a haven from congestion and overcrowding and the war weariness and hopelessness of outlook the conflict has left in its wake for many countries. War conditions achieved a virtual class revolution. There is a new aristocracy of wealth. The incomed middle class and those of small private means now find their salaries inadequate and their means no longer accomplishing independence. They are looking to new lands, to fresher and larger possibilities for their energies and their wealth. Statistics indicate that Canada is the most favored goal. Canada is also taking her toll of the United States, though that country probably never notices it except through its immigration figures. The best are coming, the experienced, capitalized farmers, and the shoals of inquiries received at any of our bureaus indicate how increasingly popular Canada, with her cheap lands and free homesteads, is becoming.

A sane immigration policy, with an open door limiting entry only by desirability, with a steady proportionate development of our natural resources and the building up of industry, will, I think, solve all Canada's economic problems, and not only alleviate the present situation, which is not as bad as many paint it, but will build up our nations to proportions few dream of. —Financial Post.

Preferential Tariffs Applicable to Imports from Canada

By WILLIAM GILCHRIST,
Chief Foreign Tariffs Division, Commercial Intelligence Branch, in the Weekly Bulletin of the Department of Trade and Commerce.

The last year and a half has been marked by several events of importance in respect of preferential tariff arrangements within the British Empire. Of especial interest to Canada is the West Indies trade agreement, formally proclaimed as having come into force in nearly all the colonies on the first of September. As the result of the Canada-West Indies conference held in June, 1920, Jamaica, the Bahamas and British Honduras were brought for the first time into reciprocal tariff relations with Canada. Those West Indian colonies which were in the trade agreement of 1912 sent to the conference delegates favouring larger preferences under the new pact and this principle was carried out. Looking over the other parts of the world, Cyprus and Samoa are found to have joined the list of colonies which have differential import duties affording Canada a tariff advantage over foreign countries. The United Kingdom under one part of the Safeguarding or Industries Act gave preferential treatment to goods of Empire origin. In addition to the mother country and the colonies mentioned, New Zealand, South Africa and Rhodesia have preferential tariffs applicable to imports from Canada.*

The advantages which Canada enjoys in the various British markets in consequence of Imperial preferences are surveyed in this article. The usual condition for obtaining the British preference is that at least 25 per cent of the value of the imported goods be derived from labour in a country entitled to preferential treatment.

United Kingdom.

A comparatively recent development of the scheme of Imperial tariff preferences is the coming into operation, this month, in the United Kingdom, of part I of the Safeguarding of Industries Act imposing duties on certain foreign goods while exempting Empire products. Britain had been already giving a tariff preference on nearly all her dutiable imports. The new measure is indicative of further approval of the principle of Imperial preference. It happens that the majority of articles made dutiable under the new customs law, relatively speaking, are not of great industrial importance to Canada. Most benefit is likely to be derived from the duty imposed on certain chemicals of foreign origin. Other articles on which the new measure imposes a duty are optical instruments, scientific glassware, laboratory porcelain, balances and measuring instruments of precision, ignition magnetos, arc lamp carbons, wireless valves and similar rectifiers, vacuum tubes, hosiery latch needles, and tungsten. Goods covered by the Safeguarding of Industries Act are dutiable at 33 1/3 per cent ad valorem when imported from a foreign country, and are free when of Empire origin.

Compared with most tariffs of the world the dutiable list of the United Kingdom is small. In the regular tariff the goods subject to ad valorem duties are clocks, watches, motor cars (exclusive of trucks, etc.), musical instruments, and accessory parts of any of these articles except rubber tires which are free of duty. On these goods and on certain wines and cinematograph films a preferential tariff, one-third lower than the rates leviable on goods of foreign origin, has been in effect since 1919. The general ad valorem tariff, applicable to foreign origin, has been in effect since 1919. The general ad valorem tariff, applicable to foreign countries, is 33 1/3 per cent, so that the rate to Canada and other parts of the Empire on articles subject to ad valorem duties is 22 2/9 per cent. On sugar, various articles containing sugar, preserved fruits condensed milk, if sweetened, tobacco, cigars, cigarettes, tea, chicory, coffee, cocoa and preparations of cocoa, and some other goods, all subject to specific rates of duty, Canada and other parts of the Empire have a preferential tariff one-sixth lower than the tariff on goods of foreign origin. Certain preferences are also allowed on spirits and wines. On a few dutiable articles, including matches and playing cards, there is no preference.

British West Indies, British Guiana, British Honduras.

One by one, the West Indian colonies, which ratified the Canada-West Indies trade agreement of 1920, have been adopting new customs ordinances granting tariff preferences to imports from Canada, the United Kingdom, and in most instances, other parts of the British Empire. Thirteen of these colonies now have the new preferential tariffs in operation.

The agreement provided for certain reductions from the West Indies general tariff on nearly all merchandise and produce imported from Canada. The reductions specified for the several colonies were to be not less than the following percentages: Bahama Islands, 10 per cent; Barbados, 50 per cent; Bermuda, 25 per cent; British Guiana, 50 per cent; British Honduras, 33 1/3 per cent; Jamaica, 25 per cent; Leeward Islands, 33 1/3 per cent; Trinidad, 50 per cent; Windward Islands, 33 1/3 per cent. The agreement failed to receive the necessary ratification by the Bermuda House of Assembly. All the other colonies have approved the pact and with the exception of Jamaica have put the new preferences into operation. Tariff revision was to be dealt with by the Legislative Council of Jamaica in October or November. Independent of the 1920 agreement, Jamaica has a preferential rate, applicable to Canada for certain cotton piece-goods. The rate of foreign cotton piece-goods is 16 2/3 per cent ad valorem. The preferential rate is 10 per cent and there is a still lower rate of 8 1/3 per cent, when the goods are made entirely from cotton grown within the Empire.

* The Australian Parliament has before it a measure containing special provisions for negotiating preferential tariff arrangements with other British Dominions. It is expected that this legislation will be enacted at an early date.

Note.—Specific duties are duties based on number or quantity, such as $2 each or 5 cents per pound; ad valorem duties are levied on the value of goods, as 10 per cent; n.o.p. means not otherwise provided for.

When the time came to revise its tariff in accordance with the agreement the Bahamas made the preference 25 per cent although 10 per cent would have fulfilled its obligation. British Honduras, in August last, raised its general ad valorem rate on foreign goods, from 15 per cent to 20 per cent, the result of which was to provide on many items a preference of 50 per cent on goods of Empire origin.

In the Bahamas, preferences are not necessarily applicable to wines, malt liquors, spirits, spirituous liquors, liquid medicines and articles containing alcohol. The colonies are not required to give preference on tobacco, cigars or cigarettes but nearly all of them have adopted differential duties on these articles favouring Empire goods. Except in the case of the Bahamas certain preferences are specified for alcohol spirits, wine, beer and ale. In all the colonies the preference on flour was to be not less than one shilling per 196 pounds. In some cases a more substantial preference has been accorded. In this respect British Honduras went furthest, making the preference on wheaten flour when imported direct $1 per 196 pounds.

Goods are not exhaustively classified in the West Indian tariffs. The item covering unenumerated goods in any tariff is therefore of much importance. Furthermore, the rate on unenumerated goods is usually the prevailing rate applicable to all goods subject to ad valorem duties. On this account the approximate levels of the different tariffs are not difficult to indicate and an idea can be given of the absolute value of the preferences which have so far been described only as per centage reductions from the rates leviable on foreign goods. The subjoined table shows the actual differential on the bulk of articles subject to ad valorem duties in the different colonies:—

	Preferential Tariff	General Tariff
The Bahamas	9⅜ per cent	12½ per cent
Barbados	10 "	20 "
British Guiana	11 "	22 "
British Honduras	10 "	20 "
Trinidad	10 "	20 "
Grenada	10 "	15 "
St. Lucia	10 "	15 "
St. Vincent	10 "	15 "
Antigua	10 "	15 "
Montserrat	10 "	15 "
St. Kitts-Nevis	10 "	15 "
Dominica	.....	.....
Virgin Islands	.....	.....

Important articles, including many kinds of foodstuffs, animals, lumber, and other commodities, are subject to specific duties, and such goods are not covered by the rates quoted in the above table.

New Zealand.

New Zealand, since 1903, accords Canada and other parts of the British Empire a preference on most of its dutiable imports. The preference is variable. Probably the most common rates are 30 per cent under the general tariff and 20 per cent under the preferential tariff. These are the respective duties applicable to hardware and ironmongery n.o.p., saddlery and harness, leather goods n.o.p., most kinds of textile goods except clothing, preserved meats, preserved vegetables, lard and provisions n.o.p., glassware, firebricks, drainage pipes, lamps n.o.p., fancy goods, toys, athletic requisites n.o.p., musical instruments, fishing tackle, cardboard n.o.p., cordage and twine n.op. tents, and some other articles. Then there is a higher scale of duties. Wearing apparel n.o.p., hats, hosiery n.o.p., toilet preparations n.o.p., calendars and showcards, cardboard or paper boxes, paper bags n.o.p., account books and many similar kinds of manufactured stationery, tinware, galvanized iron manufactures n.o.p., brooms and brushes, furniture n.o.p., preserved milk or cream, soap n.o.p., trunks and travelling bags are all dutiable at 37½ per cent ad valorem, when of foreign origin, while Canada has a rate of 25 per cent ad valorem. On some other goods the respective duties are 33¾ per cent and 22½ per cent.

Printing paper is free when imported from Canada, but 20 per cent when of foreign origin. Other articles in this latter category are certain box papers, cheesecloth, iron boiler plates, wrought pipes, iron and steel cordage, and plain iron in several forms. The Empire free list also includes a variety of goods subject to 10 per cent ad valorem when imported from a foreign country. Motor vehicles are 20 per cent general and 10 per cent preferential tariff.

The New Zealand tariff is applicable to Cook islands.

Samoa.

In April, 1920, the New Zealand Government issued a customs order providing for a new preferential tariff in Samoa, a mandated territory. The general tariff of Samoa on nearly all goods is 22½ per cent. There is a British preferential tariff of 15 per cent, which is applicable to imports from Canada. Tobaccos, only, are excluded from the preference in Samoa, and there is a short list of articles exempt from duty.

South Africa.

According to the official Year Book of the Union of South Africa, preferential duties were in effect a century ago in Cape Colony. It is stated that from 1821 to 1830 the duty was approximately 3 per cent ad valorem on British goods and 10 per cent on foreign goods and those imported from the East. However, in 1865 the early differential rates were abolished and from that time until 1903 customs duties were levied equally on all goods irrespective of origin. In 1903 British preferential rebates were authorized and they have been continued. On most goods this rebate consists of 3 per cent ad valorem. The full rate to foreign countries in many cases is only 3 per cent, and in these circumstances imports from Canada or other reciprocating British countries are free of duty. On nineteen items the rate on foreign goods is 25 per cent ad valorem, with a corresponding rate of 22 per cent under the preferential tariff. The classification of goods is not very exhaustive in the South African tariff, so that the item covering unenumerated articles has a wide application. The duties under this heading are 20 per cent general and 17 per cent preferential. On a considerable list subject to specific duties the preferences vary considerably. The articles classified under some fifty items are free of duty, regardless of origin, and on these goods there is, of course, no preference.

Rhodesia.

Northern and Southern Rhodesia are included in the South African Customs Union and have a tariff similar in many respects to that of South Africa. However, that part of Northern Rhodesia known as the Congo Basin applies the same tariff to imports regardless of origin. In the other portion of Northern Rhodesia and in the whole of Southern Rhodesia imports from Canada come under a British preferential tariff which, in some respects, is more favourable than the tariff of South Africa. The preferential rebate, for example, on

the item covering unenumerated goods is 11 per cent ad valorem.

Cyprus.

Cyprus in May, 1920, adopted a preferential rate for certain Empire products which one-third lower than the full rate. This list includes musical instruments, clocks, watches, cinematograph films, cotton yarns and piece-goods, soap, matches, woollen yarns and manufactures, furniture, haberdashery and millinery. The preferential tariff for unenumerated goods is one-sixth lower than the full rate, which is 10 per cent ad valorem. The preference is varied for wines and spirits.

News From Europe

The Quality of Norwegian News Print.

The question of the quality of news print from countries loosely written about as Scandinavia, resolves itself as things are into the question of fact. The fact, or facts, are that Swedish, Norwegian and Finnish prints recently contained many criticisms of the quality of news print from those countries, and, in addition, complaints that the paper was ill-packed and not "up to sample." Among other instances is one supplied by the Norwegian Consul General at Shanghai, who deplores in outspoken terms the injury which such criticisms do in these days of competition.—Norges Utenrikshandel.

Mr. Steele on Scandinavian News Print.

The following is a summary of two articles from Scandinavian papers which are the more interesting for the side light which they throw on a controversial question:

"Mr. G. F. Steele, the able director of the Canadian Export Paper Co. in Montreal recently visited, as is well known, Norway, Sweden and Finland to study the paper industry of these countries. He has given his opinions in interviews for various newspapers, and his impressions from the journey and we are in a position to relate some of his views. In the Montreal Gazette Mr. Steele uttered a warning against the destruction of forests in America, chiefly in the United States, but also in Canada. The forest administration in Scandinavia and Finland is described, and he suggested that it would be sound statesmanship to send an expedition of experts to Norway, Sweden and Finland to study with the aid of their experience the development of a plan for an expert supervision of forest resources in Quebec.

In the Financial Post, Toronto, Mr. Steele traced in detail the possibilities of future Canadian competition in European markets. Europe, said Mr. Steele, could offer very little export business for Canadian paper mills. The trade in newsprint could only continue, as before, with the United States, then South Africa, which offered great market possibilities, and Australia, which at the present time, is Canada's next best customer. It might seem that Canada could do business with England, but he thought not, as it would be premature for Canada to seek markets in England. Norway, Sweden and Finland supplied England for the most part with newsprint, while a portion came from other quarters, Germany and Belgium.

In a survey of the news print market in the Paper Trade Journal, there is a reference to the interviews with Mr. Steele, in which he is said to have spoken disparagingly of the quality of Scandinavian news print. These opinions, which were reprinted in many other American and Canadian sheets, excited comment in circles here, and the more so as Mr. Steele had come forward as the advocate of loyal competition, and as a pioneer for cooperation and reciprocal help between the makers of newsprint in different countries.

It seems, however, that, according to a later expression of opinion, Mr. Steele ascribed the whole affair to a misunderstanding and that the interviews were incorrectly quoted in the American Journal. Mr. Steele has further stated that his views were known in Norway, so that there should not be any misstatement on that ground. We shall therefore briefly recount the facts in their order.

In the above mentioned interview in the Paper Trade Journal Mr. Steele discussed a conference a short time before between representatives of the Canadian Export Paper Co., International Paper Co., and the chief news print consumers in the U.S.A. Mr. Steele pointed out among other things that "these publishers admitted the difficulty of obtaining newsprint, the unsatisfactory character of the European product and the preference for the Canadian. As for Europe being able to supply the shortage of news print, Mr. Steele said there was no chance of this." In direct connection with this conclusion, the folowing opinion of an official of one of the news print companies is given:

"One of the leading New York dailies purchased some 2,000 tons of European news print at a favorable rate and turned it into their daily run. It did not prove up. The quality was poor and varying, and possessed but little strength. Through breakages and other troubles, the newspaper was not able to complete its runs in time and lost heavily through non-fulfillment of circulation. When the experiment was over and costs were calculated, it was found that the paper had lost about $500 a ton." This concern will not experiment with any more European news print paper and it is understood that it has since renewed its contracts with one of the large producers in this continent. The news print man said that the quality of the Scandinavian news print would not in any case be better than it was before the war, and actually is of much inferior grade than the Canadian product. It will be expensive for publishers to attempt to change over from the strong Canadian material which they have been using for the past five years to the weaker and flabbier overseas product reported to be coming into the competitive market. He did not think that many American publishers would care for it once they began using it."

Recently Mr. Steele's attention was drawn to the matter and to the unfavorable impression which it produced in Norway and Sweden, and he wrote to the Paper Trade Journal as follows (May 26): Editor, Paper Trade Journal—While I was recently in Northern Europe, I was shown a letter from a paper importing house in which it was stated as follows: "The writer has just read an article from the Paper Trade Journal of December 23, written by Mr. George F. Steele, the Manager of the Canadian Export Paper Co., Ltd., which you know is practically the paper trust of Canada. I understand you receive issues of this journal, but quote you a portion of his communication, which reflects considerably on future news print business with Scandinavia."

The extract quoted is contained in the article in question and as you are aware, I did not contribute any article on this subject nor was I the official of the

News Print Companies who commented on foreign news print paper.

I desire, therefore, in order to dispel the unpleasant impression brought about by the wholesale circulation of a pure fabrication, to announce that I have not criticised Scandinavian paper and am not in a position to do so. I have neither seen nor heard of any Scandinavian paper that was not of excellent quality and am not in the habit of attempting to bolster up my own business by running down the products of my competitors. I will be very glad if you will give this prominence in order to dispel the unpleasant impression made by false reports. Yours sincerely, George F. Steele, General Manager.''

The transactions of Mr. Steele in paper all tell the story of the policy which he will follow—that Canada should seek to drive Scandinavia from their present markets in Europe. In that case these countries would look for new markets which Canada could enter and hold. What was his idea in sending paper to England when he was making Swedish and French competition in New York?

Another circumstance which should be noticed is that England's mills are striving to increase the production of news print so that it can satisfy the home market demand. — Pappers - Travern - Och Industritidskrift. Papir-Journalen.

Poisonous Action Of Wall Papers Containing Lead.

A case of poisoning of great interest to wall paper manufacturers, and, in a subject that has hardly been noticed if at all in treatises in industrial hygiene is reported from Hildesheim in Germany.

A family, consisting of father, grown son and daughter, manifested distinct symptoms of lead poisoning (blue line about the gums). As the illness was severe, not yielding to home treatment, the son and daughters were removed to the hospital, where they came under the care of Professor Becker, Medical Counsellor. In the hospital both patients improved without other treatment. On their return home, the same symptoms appeared in son and daughter, necessitating another stay in the hospital. The case was an enigma, since the source of the lead found in the body could not be discovered. An examination of household utensils was without result. It was then recalled that about three months before the living room and bedrooms of the family had been freshly papered and varnished. Accordingly samples of the wall paper and varnish were analyzed by an expert chemist. The result in respect to the varnish and water was negative, while in two samples of the wall papers considerable quantities of bichromate of lead were found, the samples being taken from the paper of the living room and the son's bedroom. In wall papers of the entrance hall and of the daughter's bedroom, on the contrary, no metallic poisons could be detected. It was also significant that during the winter the family often did not leave their rooms for days at a time and that the rooms were not aired sufficiently. After removal of the wall papers, cleaning and white washing a cure was gradually effected. A second examination of the wall papers in the experiment station of Hildesheim gave the following results: A square meter of the wall paper weighed 82.6 grams and contained 0.896 grams of lead and 0.2114 grams of chromium. The precise way in which the lead entered the system of these people was unexplained, though it was suggested that the most probable medium was the air of the rooms containing fine particles of the poison, or lead-dust as it is called, and in this connection poisoning from arsenical wall papers was recalled, in which cases the noxious substance was conveyed by the atmosphere. Papier-Markt. August 9, 1921.

CAREFUL LUMBERING.

The operators (under timber permits on Dominion forest reserves) are all conducting the timber operations more carefully. Stumps are cut low, trees are utilized as fully as possible, the brush is disposed of and the tracts operated are being left in good condition for protection against fire and for reproduction of the forest.—Annual Report, Director of Forestry, Ottawa.



Windigo Harbor. Transferring goods to Brown Corporation Camp. (Brown Bulletin.)

R. S. KELLOGG TALKS ON PAPER SHORTAGE.

"As in every other line of business, there have, of course, been suspensions and failures, of publishing ventures, but at the same time new publications of great variety are stated almost every year. On the whole there are more copies of publications available for the reader now than at any time during the past three years.

"There is no shortage of print paper anywhere in America and there was no real shortage last year," says R. S. Kellogg, Secretary of the News Print Service Bureau, with reference to a press statement of the New York College of Forestry entitled, "Suppression of the Press."

"The College of Forestry charges that the "Suppression of the Press" is in process of development, because of the failure of the people to recognize the importance of protecting and growing forests and the College lays great stress upon the shortage in print paper, which it says has already occurred.

"As a matter of fact," says Mr. Kellogg, "while there was an apparent shortage of newsprint paper at one period in 1920 there was no real shortage whatever, but simply a panic and fear of shortage caused by extraordinary consumption of paper the same as took place wit hsugar, coal, gasoline and other commodities. When the year was completed and it became possible to ascertain the actual facts, it was found that the newsprint manufacturers of North America had turned out 10 per cent more paper than in the previous year, while the publishers had increased their consumption only 5 per cent and that at the end of the year publishers had nearly 50 per cent more in their warehouses or in transit to them than they had at the beginning of the year.

"Newsprint paper is an article of remarkably steady consumption, because everyone who once acquires the habit of reading a daily paper maintains it steadily thereafter, unless reduced to absolute penury. For example, the statistics of the Post Office Department show that the circulation of the English language dailies in the United States which amounted to 26,715,000 copies for the 6 months ending September 30, 1919 increased to 28,113,000 copies as of March 31, 1920, to 28,232,000 copies as of September 30, 1920 and to 28,582,000 copies for the six months ending March 31, 1921.

"The great Post-Armistice boom of 1920 brought about only an increase of 5 percent in the consumption of newsprint paper over 1919, while on the other hand 1921 which marks the bottom of the industrial depression has shown a decrease of only 4 percent in standard newsprint consumption for the first 9 months of the year, compared with the first 9 months of 1920 when the use of newsprint paper was the greatest ever known.

"There has been no complaint of shortage of newsprint from any responsible source this year, and, as a matter of fact, the newsprint mills have been unable to operate to capacity because of the continual offering in this market of newsprint from overseas at prices, because of depreciated exchanges, which are below any possible cost of production in America.

"The New York State College of Forestry is to be commended for its championship of the cause and the need for better protection and development of our forest resources, but its statement would carry more weight were they based upon an accurate knowledge of present and prospective commercial conditions. The paper manufacturers of America have taken the lead among all the great industries in protecting their timber holdings from fire, in cutting them conservatively and in planting trees to furnish a future supply of pulpwood. In these undertakings they need and must have the cooperation of the public in fire prevention, in a revision of the tax laws so that the private owner can afford to hold land for the growing of a crop of timber and in studies to determine the silvicultural methods best adapted to various regions and species. Forestry cannot succeed unless it pays its way, and all that the newsprint paper manufacturer asks for is fair treatment for the timberland holdings, which are the source of his raw material and protection from the absolutely ruinous competition with his produce that is now taking place because of the fact that the German mark has almost reached the vanishing point."



Camp Windigo. Headquarters of the gang that gets the wood for the mills at La Tuque. (Brown Bulletin.)

Waste in Box Board Mills

Waste means loss; waste means the loss of something which could be saved.

In box board mills the problem of waste prevention is a serious one needing continuous and careful attention from the fact that there are so many ways in which losses may occur.

The waste of time and material by careless and time-killing employes is one which may be corrected by efficient superintendents and foremen.

The waste of fuel in the power plant through imperfect combustion, low temperature feed water, or dirty boilers may be corrected by a diligent engineer.

The waste in radiation may be corrected by the proper covering of steam pipes and boilers.

The waste of power in the beater room can be lessened if the beater man can be educated to handle the rolls in the right way.

Waste heat from exhaust steam can be used for drying paper and heating the buildings.

The waste from trash received in paper stock (mixed paper) cannot be avoided.

The most serious source of loss in board mills and usually the one to which the least attention is paid is the waste water from the machines. I have seen sewers from paper mills lined their full length with valuable pulp and in places where they would overflow, the ground would be covered inches thick with it. The main idea seemed to be to get rid of it the quickest and easiest way; dump the vats, wash them out and let everything go to the river. I will say though that more attention has been paid to this loss in the last few years; ways of using this waste water have been devised, thereby saving what stock was in it.

Save-Alls.

Save-alls are being put into use; a fat friend of mine up in Wisconsin makes a very good one. It is every one's patriotic duty to save pulp wherever possible in in the mills, thereby conserving the fast diminishing supply of pulp wood. No matter how much money a mill is making, there is no excuse for wasting pulp. Save it all and put it back into paper.

The saving of waste water from the machines in any mill is not a very difficult or expensive job. The most efficient method that I have found and which I put into successful operation in a large box board mill was to drain or collect all waste water from the machines, stock pumps, screens, etc., in a central point (shallow well or sump) and deliver it by a centrifugal pump to a tank of large capacity, the beaters getting their water from this tank. There would be times when the beaters would not use all the water put into this tank, naturally causing it to overflow, which would mean some waste, but this overflow was taken care of by another tank from which a pipe led to the save-all, thereby saving it all. There were times when the save-all had nothing to do, but it was there and ready, like a good catcher, allowing no "passed balls."

By the above described arrangement the reclaimed pulp in the waste water is passed back to the beaters where it is mixed with fresh stock. The same disposition is made of stock reclaimed by the save-all.

Reclaimed water in the tank from which the beater room draws its supply can be easily kept hot by the proper arrangement of coils and the use of exhaust steam.

One of the objections to the use of a tank for waste water is that a large amount of stock settles there and must be emptied and washed out periodically. This, I believe, could be avoided by using a steel tank with a taper or hopper bottom, at least 60 deg. taper, with the outlet to the beater supply pipe at the lowest point. There could then be no settling, everything going to the beaters. The saving of pulp by this method is not the only saving; there is a saving of fresh water and water is a vital thing in some mills where the supply is limited.

The wastes in box board mills, though numerous are not difficult to correct if manager and superintendent notice them and insist on their correction. "A penny saved is a penny earned"; the same thing applies to dollars.

Every box board mill has its own separate waste problem; all are different. Some are easily corrected, while some are not so easy. None, however, is so difficult but with some ingenuity it can be solved. In putting up a new plant, this saving of waste water should be included in the plans, when it could be done with slight expense.

One rarely realizes what is being lost through waste water until the evidence is before him. I can well remember when I first saw the save-all put to work, and the amount of good stock which came from it. Then I reflected at the years we had been letting all this water go to the river in blessed ignorance of the dollars that were going with it.—The Paper Industry.

It looks as if the Germans are looking for a kink in their commercial plans because of the prospect that the Washington conference may result in the turning of the world's man power into producting good instead of ammunition.



He can't pinch his fingers with both hands on the handles, where they must be.

British Trade News

(From Our London Correspondent.)

London, Nov. 4, 1921.

Mr. R. J. Marx, B. Sc., is in charge of the Battersea Polytechnic engineering section for the purpose of advancing students in papermaking and it was through him that the recent film showing Canadian newsprint in process of manufacture was shown to the public. Mr. Marx should be a successful teacher, owing to the practical experience he has had in papermaking and machinery in England, Canada, and other places. He is now introducing the Elmendorf Tearing Tester into Great Britain.

Force Majeure Clause.

Who is the woodpulp man that has not heard of the Force Majeure clause? Well, it has been tested in an arbitration case in London between Korsnas Sagverks Aktiebolag and Craig & Sons, Ltd. Messrs. Craig bought through Erikson & Co., who are agents for Korsnas Sagverks Aktiebolag, 1,500 tons of No. 1 strong sulphite, shipment to be fairly spread during the navigation season of 1921. The deal was on the usual British Wood Pulp Association basis. But trouble arose. The was the big coal miners strike in England which closed the Moffat Mill and the Caldercruix mill, where the pulp was to be used, and sonsequently Messrs. Craig were hindered inmaking paper. They then claimed the privilege, under the Force Majeure clause, to cancel three-sevenths of the total quantity of 1,500 tons contracted for, or 643 tons. The sellers refused the cancellation on the ground that Messrs. Craig were only entitled to one-twelfth of the total quantity for each month they were shut down, namely 3-twelfths, or 375 tons all told. The legal questions then arose: (1) what was the interpretation of the Force Majeure clause; (2) what quantity of pulp should be cancelled? One Solicitor, one Barrister-at-Law, with a King's Counsel as Umpire, constituted in court. Both sides were represented by Counsel. They found that Messrs. Craig were at fault in refusing to take more than 857 tons of pulp under the contract and that they were bound to take, in the events which had happened, 937 tons of such pulp and no more. They were in default to the extent of 80 tons, being the difference between the 937 tons, which they ought to have taken, and the 857 tons, which they were prepared to take. Each side pays their own costs, but Messrs. Craig are to pay the costs of the arbitration, £88.

For the information of Canadians who have not had any dealings under the Force Majeure clause, I quote it for future reference: "The buyers or sellers may suspend deliveries under this contract pending any contingency beyond their control, which prevents or hinders the manufacture of paper or the manufacture of pulp, viz., the Act of God, war, strikes, lock-outs, drought, flood, accidents, total or partial fire, obstruction of navigation by ice at port of shipment, and loss and detention at sea or the like. The party affected shall give prompt notice to the other party of the cause and commencement of such suspension and also of when it ceases to have effect, and deliveries shall be resumed pro rata according to the production of the sellers or the consumption of the buyers. When such suspension shall have been continued for one calendar month the delivery for that period shall be cancelled unless otherwise agreed. For each succeeding period of one month the same course shall be taken. In the case of single cargoes or deliveries at longer intervals than one month, one-twelfth of a year's deliveries shall be cancelled for each month's suspension. In the event of the works of either buyer or seller being totally destroyed by fire and not rebuilt, this contract to be null and void." This is a most useful clause in a contract and the Craig Arbitration stoutly upholds it. Whoever the lawyer was, or the pulp or paper man, who originally drafted the clause, he deserves credit for common sense.

The Controller?

One daily sees references to the war time Controller of the British paper industry, and probably none are so interesting as the recent mild castigation administered by the London "Financial Times". It says: When, during the war, the paper controller was put into power and installed in a little office with a few clerks to take in hand the business of paper, he counted up the mills, took the Board of Trade returns, collected a few figures as to shipping, and fondly imagined that he had got a grasp of the paper trade. He was rudely brought to his senses by Lord Riddell, who by a simple process in calculation called his attention to the fact that there were 60,000,000 transactions every day of the week in Great Britain alone, involving the sale and purchase of paper. The whole of the legions of the bureaucrats combined into one great paper office could not possibly control any such volume of business. Something was to be said for the Paper Controller at that time, because, while the war was on, his duty was to restrict the trade in paper and make unemployment in order to find men for the Army. If the various experts now concerned with the curing of unemployment had been employed in 1915 in the business of recruiting there might have been some sense in the arrangement.

Paper Outlook.

There is still a dullness pervading the paper industry. Official reports say that employment is generally bad and that is my barometer. If trade is good there is plenty of work; if it is bad workers are idle. At all events official reports now state that mills are closed in certain places.

British Imports.

In my notes two weeks ago I made special reference to the difference between the imports and the exports of paper into the United Kingdom. Mr. Stanley Cousins, the well-known paper-maker, and Mr. W. C. Powers, have taken up the subject of written letters to the papers. This shows how thoroughly up-to-date Mr. Cousins is as a business-man; it shows his keenness — while others are asleep, he is alive and "doing". Mr. Cousins says it is essential to give wide publicity to the growing imports of paper and to emphasize the fact that those are steadily increasing at a time when British mills are suffering badly for want of orders. The pre-war imports were approximately 48,000 tons per month; today they are about 35,000 tons. He adds: "It will be obvious that the foreign mills are rapidly getting back to pre-war volume of business with Great Britain. It is equally obvious and unfortunately true, that British mills are running only one-third normal capacity, while the orders go abroad, largely to producing countries whose currency is heavily depreciated. If our British manufacturers can be aroused to this menace of increasing imports, and will realize the chief reason why home mills are shut down, we feel sure that the industry will be unanimous in its appeal to the Board

of Trade for relief from this unfair competition. The paper manufacturers of Great Britain have a powerful case for a tariff against dumped goods and against imports from countries with debased currency. We have felt that the mills are not fully alive to the reasons for their present difficulties and to the remedies available. We feel certain that if the British mills grasp these facts they will realize the critical situation that the industry is in at present and will co-operate in quick and efficient action."

No finer pronouncement has been issued from a paper man for some years and it bears out what I have written in the "Pulp and Paper Magazine" since 1912. The British papermaker wil put politics before business; they will say now: "Stanley Cousins wants Tariff Reform."

THE CASE FOR RAGS.

Out of the dust and mould
Just an old worn suit case
With its story—it came to unfold.

I had written to the storage warehouse to please forward it along with other left-behinds of home "paraphernalia."

It came, with its mouldy and torn exterior. The dented corner, and broken straps in dry pieces gave true witness to its age and the passing of time.

Its contents were purely personal; such things as we lay aside to keep because of a desire to preserve some memory in its freshness, also the usual odds and ends by way of records, receipts, letters, etc.

It alone, of all the pieces, escaped the vandalism which leaves its record by a touch of absence, resulting from indefinite and uncertain storage.

I opened its rusty lock on a quiet Sunday morning and began sorting it s contents to meet the wishes of my better half—lunch still found me at it. Into the working of systematic division many a memory had forced itself but, as I have said, it was purely personal, except for one outstanding fact—its contents were all paper. As a living exhibit of facts which are supposed to be without Life, it was a fine example.

The story told by the old bag fairly bristled with crisp, crackling paper, against a background of mealy, loggy, lifeless stuff, also paper.

The rags told—they lived their argument.

The other stuff had served but seven years or so and was mostly wreckage—cellar dampness, dust, dirt, mould and time had made it lifeless. The rag bond paper stood the test. Fortunately, the very messages I wished to preserve, with one exception, were written on this paper. The one I discorded was hard to tear. The others went into the waste witha musical rip!—rip!

As a moral let me add. Worthy messages are lost if they are carried on unworthy paper.

By the way, I've even thrown the bag away. —The Crest.

NEW COATING MILL.

Samuel Jones (Devonvale) Ltd., have started their new coating mill at Tillicoultry, in Scotland. Formerly the mill was used in the textile industry, but with some alterations it was soon converted into an ideal coating mill and the position is a good one, being close to the railroad and river Devon. It is estimated that the capacity of the plant is equal to 3,000 reams, 20 inches by 30 inches, a week. The firm is a "go-ahead"

GENERAL CHEMICALS.

Current Wholesale Prices in New York Market. Week of 2 November, 1921.

		Carlots	Less Carlots
ACID, Acetic, 56 p.c.	100 lbs.	6.00-6.25	6.50-7.00
" Glacial, 99½ p.c.—carboys	"	10.75-11.00	11.25-11.50
" Hydrochloric	100 lbs.	1.25-1.50	1.60-1.75
" Sulphuric, 66 deg.—drums	ton	21.00-22.00	22.50-23.00
ALCOHOL, Ethyl	gal.	....-....	4.50-5.00
" Methyl (see Methanol)		....-....	....-....
" denatured, 188 proof	gal.	....-....	.37-.38
ALUMINUM Sulphate, commerc.	lb.	.01¾-.02	.02¼-.02½
" Sulphate, iron free	lb.	.02½-.02¾	.03-.03½
AMMONIUM Chloride, granular (white salammoniac)	lb.	.07-.07¼	.07½-.07¾
(grey salammoniac)	lb.	.07¼-.07½	.07¾-.08½
BARIUM Sulphate (prec.) (blanc fixe)	lb.	.04-.04¼	.04½-.05
BLEACHING Powder (calcium hypochlorite)	100 lbs.	2.35-2.40	2.50-3.25
CHLORINE, gas, liquid cylinders (100 lbs.)	lb.	.08-.09	.09½-.10
GLYCERINE, C.P., drums extra	lb.	....-....	.14-.15
LITHARGE	lb.	.07½-.08	.08¼-.09
METHANOL, 95 per cent	gal.	....-....	.66-.68
POTASSIUM Bichromate	lb.	.10¼-.11	.11¼-.11½
" Hydroxide (caustic potash)	lb.	.06-.06¼	.06½-.08
" Prussiate, yellow	lb.	.20-.20½	.21-.22
SALT CAKE (bulk)	ton	....-....	20.00-22.00
SODA ASH, Light	100 lbs.	2.10-2.15	2.20-2.60
" " Dense	100 lbs.	2.35-2.40	2.45-2.70
SODIUM Borate (borax)	lb.	.05½-.06	.06½-.07
" Carbonate (sal. soda)	100 lbs.	1.75-1.90	2.00-2.25
" Hydroxide (caustic soda)	100 lbs.	4.10-4.15	4.20-4.75
" Prussiate, yellow	lb.	.14½-.14¾	.15-.15½
SULPHUR, Crude	ton	18.00-20.00	....-....
" Dioxide, liquid, cylinders extra	lb.	.08-.08½	.09-.10
ZINC OXIDE, XX	lb.	.07-.07¾	.08-.09

During the past week the chemical industry was active — orders reaching the market in good volume. It is reported that some of the largest alkali plants have reduced their overhead, and are working at capacity.

It is thought the New Year will find the chemical industry on a stronger footing than at any time since slump in business.

Solid caustic soda is attracting attention at $4.10 per hundred pounds, and large dealers were not inclined to quote beneath this figure at any time during the week.



New Showrooms of the Diamond State Fibre Company of Canada, Limited, at 235 Carlaw Avenue, Toronto, displaying a full line of their varied products, amongst which will be seen electrical parts, automotive parts, trunks, roving cans, waste baskets, gears, lamp fittings.

PULP AND PAPER NEWS

The sriking printers of Toronto have, for long, been attempting to convince the Methodist denomination with the righteousness of their cause and the injustice of that of the employers. There are many reasons why they have made a special "dead set," so to speak, at this particular denomination. For one thing, among leading Toronto Methodists are a large number of keen social and moral reformers who, while very wealthy men themselves, have been noted for their advocacy of "social justice" for the workers. Then Mr. James Simpson, the well-known Socialist, who has made the cause of the strikers in the present contest peculiarly his own, is a prominent Methodist. Finally, the steward of the Methodist Bookroom, the Rev. Dr. S. W. Fallis, is also the chairman of the employers' organisation; and the strikers, no doubt, felt that, if they could bring Methodist pressure to bear on him, it might conceivably break the steady resistance which the employers have hitherto offered to what they feel to be inequitable demands, in the matter of the forty-four hour week and cognate questions.

But it now looks as though the striking printers have altogether failed to make an impression on the influential circles of Canadian Methodism. Last Thursday, the Board of Evangelism and Social Service of the Methodist Church in Canada, adopted a carefully-worded resolution, outlining the attitude of the Methodist Church towards the present printers' strike. The resolution definitely declined to engage in dogmatic statement on technical matters, such as wages or hours suited to particular industries. It heartily confided in the Methodist Bookroom and its Steward, and it declared "that no industry should be subject to arbitrary dictation, either by the owner of the plant or by the men who operate it." The resolution reaffirmed the Board's faith in the principle of collective bargaining and in the right of Labor to organize, and expressed readiness to strengthen the bonds of the Steward in every effort made for a generous settlement and deplored the fact that a deadlock had developed. The resolution was a very lengthy one, and, as has been said, was worded with care. But, read as a whole, it distinctly conveys the idea that Capital has its rights as well as Labor, and that both must be respected.

The annual convention of the Association of Canadian Advertisers was held in Toronto last Thursday and Friday. At a special luncheon for the delegates, who are representative of the larger national advertisers. Mr. W. N. Bayless, of Cleveland, Ohio, spoke very interestingly on sales promotion in the relation to advertising activities. He pointed out the need for intensive research, and of a close study of facts for use in systematic and efficient advertising. The delegates to whom the writer spoke were sanguine as to the revival of general business conditions. Several questions relative to agencies and general advertising rates were discussed and resolutions thereon adopted.

It is reported that the utmost activity prevails at the plants of the Spanish River Pulp and Paper Mills, Ltd. They are, in fact, producing to capacity.

The annual convention of the Canadian National Newspapers and Periodicals Association was held on Toronto last week. Mr. John Weld, of London, and Mr. H. T. Hunter, of Toronto, were elected president and vice-president respectively.

Weekly luncheons are being held in Toronto by the local members of the Canadian Paper Trade Association. They are proving of considerable value, not only from the social, but also from the business point of view, as they furnish an opportunity for the discussion of matter of common concern to those attending them.

In connection with the printers' strike in Toronto, an official of Local 91, International Typographical Union, stated, last Friday, that some the work of the printing of voters' lists had been given to what are listed by the Union as "fair" shops, and that this had resulted in some reduction in the strike pay-rolls, and that some men were being placed in positions out of town, with the consequence that the number receiving strike allowances is being steadily reduced. He added that while making no effort to hold up the printing of these voters' lists in "open" shops, the Union was using every influence to have as much of such printing as possible done in "fair" shops.

The negotiations set on foot with the idea of effecting a settlement of the claim brought by the Ontario Government against the Shevlin-Clarke concern, of Fort Frances, Ont., details of which have been given in these columns, have broken down, and the action will now go to trial.

Some months ago it was reported in these columns that a very large amount, in respect of arrears of unpaid taxes, was owing to the Dominion Government by the Riordon Company. The matter has now, within the last fortnight or so, assumed the proportions of an election issue. Indeed, a prominent Liberal told the writer this week that he expected it would be an important contributory cause to the defeat of the Government. The issue is stated by opponents of the Government in these terms: Does the little man have to pay his taxes in cash, while the big man gets off with promissory notes? The Toronto Globe has given much prominence to the matter in a series of uncompromisingly direct and highly effective editorials which emphasizes the point that the controlling stock interest in the Toronto Mail and Empire was in the hands of Messrs. Charles and Carl Riordon who were responsible for the policies of the Riordon Company in the years when that Company was allowed by the Government to pay its war taxes with promissory notes which (it is alleged) have not yet been redeemed.

Mr. Howard Taylor, chief engineer, and W. G. Zimmerman of the staff of H. S. Taylor, Ltd., left Tuesday night for Quebec, en route for the North Shore.

Mr. A. L. Dawe, the newly appointed assistant to the general manager of the Canadian Export Paper Co. left Saturday night for a business trip to the United States.

Mr. Norman Wainwright, in charge of the export business of Howard Smith Paper Mills, has returned from a four months trip to Australia and New Zealand. He reports prospects as being noticeably improved.

Mr. J. N. Stephenson, editor of the Pulp and Paper Magazine, addressed the Montreal Paper Club at their regular luncheon on Tuesday. The subject was the Manufacture of Paper, with brief descriptions of the various raw materials and the principal processes.

Mr. L. R. Wilson, secretary of the Abitibi Power and Paper Co., is still in the Western Hospital, Montreal, recovering from an operation on his throat.

CHANGES IN CANADIAN EXPORT PAPER CO.

Mr. George F. Steele, General Manager of the Canadian Export Paper Co., has been in poor health for some time. A few weeks last summer at Watkins, N.Y., did not result in complete recuperation, so the Company has granted him a more extended leave of absence in hopes of a full recovery of his health. During Mr. Steele's absence the management of the Company's affairs will be guided by a committee,



ARTHUR L. DAWE.

consisting of Messrs. Crooker, Bryan and Thorn, sales-managers of Laurentide Co., Brompton Pulp and Paper Co. and Price Bros. & Co., with the assistance of Mr. A. L. Dawe, who has just become associated with the company.

FIBRE CASES FOR SHIPPING RUBBER.

Of considerable interest to rubber shippers in British Malaya and of great importance to rubber manufacturers is the recent introduction of a new type of shipping case into Singapore shipping circles by a representative of an American company. The United States Consul at Singapore writes that these cases, made of 100 per cent fibre, come from the manufacturer in the shape of sheets, the riveting, packing, and wiring being done by local shippers. The cases hold from 225 to 250 pounds of sheet rubber, as compared with 200 pounds contained in the wooden chests, at no sacrifice of surface space, by reason of the thinness of the incasing walls. Their practically nonbreakable quality and absolute cleanliness have been proven, while it is claimed that they are waterproof.

BECK SUCCEEDS DAWE.

At the last meeting of the Executive of the Canadian Pulp and Paper Association, Mr. A. L. Dawe, who has been secretary of the organization for upwards of four years, tendered his resignation in order to accept an important position with the Canadian Export Paper Co. Mr. Edward Beck, who has been in charge of the publicity work of the Association for several years, and has been in close touch with other phases of the Association's work, was appointed Secretary and Manager.

Mr. Dawe has made an enviable record, and Mr. Beck is looked upon as a very happy choice as his successor.



EDWARD BECK,
New Secretary of the C. P. & P. A.

GIVE THE CHILDREN A CHANCE.

Everyone knows that on the children of today depends the future of the nation, but too few act rationally on that knowledge. Children are in the pliant stage when they can be influenced for good or evil, and the result will last their whole life. That is why two or three of the fundamental truths should be impressed on them now. What they learn now will remain theirs forever. Teach the boys and girls thrift and their future is assured. Let them grow up careless of their money and their time, and you are laying a solid foundation for a life of misery. Many of the boys who are going to school now will in a few years work in some industrial plant. If they are impressed now with the idea of safety they will grow up into safe men,—men who will not only be free from accident themselves, but will do a tremendous lot to keep those working with them free from accident as well.

The best way to inculcate thrift and safety in the children is for Daddy and Mamma to set the example. Children are great imitators. Whatever Daddy does or Mamma does, they will copy. If Daddy and Mamma save their money and help the children to save their little bit too, they are giving their boys and girls one of the biggest assets of life. If they are careful themselves in any work they do, the little ones will copy them and grow up careful and safe. It is up to the Daddies and Mammas to give the children a chance.—Broke Hustler.

Technical Section

REVIEW OF RECENT LITERATURE.

L-5. Glucose. AME PICTET, **Helv. Chim. Acta,** iii, 649 (1920); **Paper,** xxviii, 14 (June 8, 1921). Brief discussion of the constitution of alpha- and beta-glucoses and of their anhydrides, glucosan and levoglucosan, respectively.—A.P.-C.

M-4. Friction between Leather Belts and Cast Iron Pulleys. Zellstoff und Papier, i, 5, 149, Aug. 1, 1921. The friction between leather belts and cast iron pulleys is one of the most important facts underlying belt drives and Doctor Rudeloff has investigated this matter using a specially built apparatus, details of which may be obtained in "Mitteilungen aus dem Materialprufungsamt zu Berlin-Dahlem." Pieces of leather were pressed against a cast iron rotating disk and the leather selected was tanned in the normal way and in the fat free condition. The following conclusions were drawn: 1. The direction of the sliding motion with respect to the leather is without influence on the frictional force, R. 2. The area of the surface, P, influences the frictional resistance in such a way that R increases as F and in a greater degree than F. 3. With the same velocity, R increases proportionally with the load, P. In several series of tests, R was directly proportional to the load and accordingly the coefficient of friction, $Mu = \frac{R}{P}$ In other tests $R = Mu\ P^a$ where a appeared to be independent of the velocity. 4. With increasing velocity, the frictional resistance increased, and corespondingly the friction number, Mu. The direction on this increase is different for the different samples of leather and the cause appears to be in the difference in the surface condition of the leather. With low velocity, the fat free and with high velocity, the normal leather showed greater frictional resistance. 5. Under the same load, R with low sliding velocity was greater for the fat extracted leather, but in the case of the normal leather R was greater under greater velocity.—H. E. W.

N-4. Modern Boiler Plant. W. S. JOHNSTON, **Combustion; Paper,** xxviii, 16 (June 22, 1921). Brief sketch of the development in boiler room and engine room design as regards the ratio between floor area and evaporation and floor and power developed.—A.P.-C.

N-5. Coal Handling and Paper Mills. H. B. MOSLEY, **Paper Industry,** ii, 3 (June, 1921). The description of a coal handling system recently completed and put into successful operation at the Lock Haven Mills of the New York and Pennsylvania Company, Lock Haven, Pa.—A. C.

N-6. Electric Steam Boilers. G. A. MAILLET, **Papeterie,** xliii (June 10, 1921). The first commercial electric steam boilers were perfected by the Italian Revel, and there are at present several hundred in operation in Italy. Several large Swiss firms (Brown Boveri, Escher Wyss, etc.) are turning their attention to the construction of these boilers, and they are coming into fairly wide use in Switzerland. These are relatively small. They can use current at 6,000 volts, but the manufacturers guarantee good results only at 3,000 volts or less, and higher voltages require special complicated equipment. About 300 horsepower can be obtained per electrode. What are probably the largest electric steam boilers in the world are in operation at the Frédet paper mills, at Brignoud (Isère), France. They were constructed by the Etablissement Régis Joya, Grenoble, and are of 5,000 hp. each, and take 3-phase, 50 cycle, A.C. at 6,500 volts, and about 800 hp. are obtained from each electrode. The first was put into operation at the beginning of May, 1920, and the second shortly after, and they are used to supply steam to the driers of four paper machines. They have been used both alone and in conjunction with coal-fired boilers, according to the amount of power available from the central station and the production of paper. They can be brought up to pressure (6 kilos = about 80lb.) in less than half an hour, as has been shown by actual trials; but it is preferable to do so in three hours. When they are under pressure, the power absorbed can be varied within every limits almost instantaneously. As the boiler is very large (10 meters long by 1 5 meters in diameter) it serves as a steam accumulator of large capacity and makes operations much more regular. A paper machine or a digester can be started or stopped suddenly without abnormally affecting the steam pressure, or the current may be turned off for over half an hour without interfering with operations. To prevent uneven expansion of the boiler shell, which strains the rivets and might cause leaks, the bottom of the boiler may be heated by some suitable automatic device, or the water may be fed in hot. The electrode insulators are of fused quartz of a special patented design, the factor of safety of which is very high.—A. P.-C.

R-11. Forest Products Laboratory's Program. Chem. Met. Eng., xxv (July 6, 1921). Outline of the researches to be followed up at the Forest Products Laboratory during 1921-1922 on the reduction of waste in the wood manufacturing and pulp and paper industries, timber testing, wood distillation, seasoning of lumber, and wood preservatives.—A. P.-C.

R-12. Reasons for High Newsprint Prices in 1920. W. S. PAPE, **Paper,** xxviii, 16 (June 22, 1921). Analysis of conditions which caused newsprint prices to soar in 1920, showing that it was due to inconsiderate buying and bidding against one another on the part or the publishers.—A.P.-C.

FORESTRY AND PAPER MAKING.

I (this sheet of paper) was made out of a green tree. If that tree had been burned, I would be just a cinder. If I am more useful than a cinder, please help to keep my beautiful green brothers from being turned into ashes.

KEEP FORESTS ALIVE

Living forests provide us with wood material of all kinds for our homes and industries, but burned forests provide no lumber for the sawmill, no work for the working man, no business for the merchant, and no freight for the railway or steamship. The moral is that everyone should be careful with fire in the woods.

UNITED STATES NOTES

Beaumont, Texas, is being considered as a possible site for a paper mill by interests in the East, according to T. E. Brazleton, industrial agent of the Santa Fe Railroad, who has been surveying the possibilities in Beaumont for the paper people concerned. Mr. Brazleton says that these interests want to establish a plant for the manufacture of wrapping paper, wall paper and similar lines. As the result of his investigation, Mr. Brazleton has been able to supply data on the amount of timber and timber waste available in territory adjacent to Beaumont. He states that he has found there is much material of the sort available and that there are ample distribution facilities.

Elections held recently by the International Brotherhood of Paper Workers resulted in the retention in office for a further two-year term of Jeremiah T. Carey, of Albany, who has headed the brotherhood for the last sixteen years. Other officers elected were: M. H. Parker, Richmond, Va., first vice-president; Frank Barry, Albany, N.Y., second vice-president; Frank McLeod, Espanola, Ont., third vice-president; George J. Schneider, Appleton, Wis., fourth vice-president; Matthew Burns, Kaukauna, Wis., secretary and Dominic McDermott, Bellows Falls, Vt., treasurer. Two hundred and sixteen locals participated in the voting.

Harrison E. Howe, a prominent figure in the field of industrial chemistry, has been elected to succeed Dr. Charles H. Herty as editor of the **Journal of Industrial and Engineering Chemistry** and director of the American Chemical Society News Service. Dr. Herty resigned the editorship to accept the presidency of the newly formed synthetic Organic Chemical Manufacturers' Association of the United States. Mr. Howe is a well-known industrial chemist. In the world war he was consulting chemist of the nitrate division of the United States Army ordnance bureau. Until his election to his present position Mr. Howe was at the head of the division of research extension of the National Research Council.

John C. Luke, president of the West Virginia Paper and Pulp Co., died recently in New York City, Mr. Luke was 64 years old at the time of his death. After serving as superintendent of various paper mills, Mr. Luke organized his own company and built a mill at Piedmont, W. Va., to make sulphite pulp. This business grew from a twelve ton daily capacity in 1889 to a daily output of 650 tons of book paper at the present time.

The Portland, Astoria and Pacific Railroad, which runs thirty-three miles from Portland west, into the largest body of standing timber in Oregon, is on the market, according to a report from Minneapolis which states that conferences arranging for its purchase by Great Northern and Northern Pacific interests are now going on.

The Grass Fibre Pulp and Paper Company has plans under way for the erection of a steam-operated power plant at Leesburg, Fla., to be used in connection with its new pulp and paper mill there. E. R. Lacy, vice-president and general manager, has announced that bids for the work have been received and that the contracts will shortly be awarded.

Employees of the Stone and Forsyth Company, Boston, Mass., recently tendered a banquet to Edward H. Stone, directing head of the company. The dinner was given in the Hotel Lenox to mark the fortieth anniversary of the firm's founding, besides being intended as a token of esteem to Mr. Stone, one of its founders. Mr. Stone has served as treasurer since the company's organization. The employees presented him with a handsome silver vase, suitably inscribed.

A new concern, the Read Paper Company, has been organized in Philadelphia by Vernon R. Schroff, until recently head of the cover paper department of the Whiting-Patterson Company. Offices have been opened in the Drexel Building from which a circular letter has gone out announcing the company's business plans. It is stated that it will specialize in book, printing papers and specialities. Mr. Schroff has been in the paper business in various capacities with leading manufacturers and jobbers since 1898.

A bulletin sent out by the Philippine Bureau of Commerce tells of the organization recently of a company which plans to erect a paper plant near Manila. This is the first real step ever taken for the exploitation of the potential paper industry of the Philippine Islands.

Mr. W. G. MacNaughton, who was seriously injured in an automobile accident recently, is now out of the hospital and making good progress toward recovery.



PUT IT AWAY, JASON, WE KNOW YOU

—From the Paper Mill.

The Markets

CANADIAN TRADE CONDITIONS

Toronto, 12th November. — There has been little change in the paper situation during the past week. But the occurrence of Thanksgiving Day on Monday last must surely have reminded those connected with the industry of much that they have to be thankful for during "the year that's awa'." For that year has been one to test the fibre of every industry in the country. And few industries, indeed, have come through the severe ordeal in such sound and satisfactory shape as that in which speaking by and large, the paper inductry, as one of the very foremost of the industrial units of Canada, in all its branches and ramifications, has emerged from it. On the whole, in spite of a period of depression almost unexampled alike in its scope and in the suddenness of its advent; in spite of unsettlement in almost every direction, of a kind little short of bewildering: in spite of a maze of complications in the path of readjustment and deflation; the industry has stood the strain. Here and there, there has been a collapse, at any rate rate for the moment. But the very infrequency of any such regrettable incident, while it may have tended to exaggerate its importance, at the moment, in relation to the whole industry, must, on maturer reflection, afford evidence of the soundness and stability of the industry as one of the basic factors in Canada's manufacturing and mercantile eminence. The paper trade of the whole country, and those interested in it, have much for which to be thankful. It seems certain, humanly speaking, that the tide has turned, and that, henceforward, the course will be a prosperous one. It is unlikely—and, on the whole, undesirable—that we shall again witness anything like the boom of some years during, and following, the war. The hectic days of "found money" are gone—and they are not likely to recur. Hard work, sound methods, efficiency in operation and quality in products—it is to these that the pulp and paper industry of Canada must look to retain its high standing in the markets of the world. Unless one much mistakes the men behind the organisations which, in the aggregate, compose this great manufacturing unit, these essential attributes to success, in the days of keen and strenuous and wit-sharpening competition that lie ahead, will be forthcoming in abundant measure.

PULP.—There are indications of a better demand for mechanical pulp and the production in some mills is being increased. As regards chemical pulp, the demand for kraft is improving, as is that for strong bleached. Easy bleaching and strong sulphite, too, are somewhat looking up, but producers complain that they are difficult to market at a figure showing a proper profit. In this connection, the importations from certain European countries to the United States still constitute a formidable handicap. Prices show but little alteration, and such extra demand as is forthcoming has not, so far, shown a tendency to render them firmer. Easy bleaching is about $57 to $60 at the mill and strong sulphite around the latter figure. It should be added that producers seem to have some considerable confidence that the competition just mentioned, from European countries, such as Germany and Sweden, for instance, will not continue, in an acute form, much longer. This confidence is apparently based on the belief that the consumption of pulp in Russia and elsewhere in Europe is about to be increased, thus providing an outlet for the surplus which has been coming to this continent.

NEWSPRINT.—Mills manufacturing newsprint are reported to be increasingly busy. The fillip given by the election campaign is making itself felt. So far as demand is concerned what change there has been has undoubtedly been for the better. Prices have not fluctuated much for several weeks. It is anticipated that, before many weeks are over, there will be a substantial increase in production.

BOOK PAPERS.—Business, all along the line, is improving in book papers. Price reductions, so the writer is informed, may now definitely be looked on as out of the question. With consumers no longer looking for anything in this direction, and with increasing signs of a revival in general business, as indicated by a greater activity, though partly, perhaps, seasonal, among retailers, the book paper market may be said to be in an encouraging position.

BONDS AND LEDGERS.—The business in bonds and ledgers is distinctly on the up-grade. Jobbers are sanguine as to prospects from now on. As with book papers, so with these lines; the indications of a general revival in business are held to presage a period of enhanced activity. Sales are showing an increasing improvement. The same thing applies to writing papers.

BOARD.—The board market is evincing a good tone. The paper box plants report as being very satisfactorily busy, with every prospect of going from good to better very soon. In some lines, such as chip board and straw board, there has been a rise in price of $5 a ton, and the lines which have not advanced are firmer in price.

WRAPPING PAPERS.—Kraft is in good demand. The mills are busy and prospects for export trade are said to be on the mend. The demand for manila, however, is not as brisk as could be desired.

TOILETS AND TISSUES.—The situation in both toilets and tissues continues satisfactory. "A nice volume of business in hand and prospects ahead bright," is the way in which one manufacturer summarized the situation to the writer today.

RAGS AND WASTE PAPER.—The market for both rags and waste paper is improving in strength. Roofing rags and new cotton cuttings are in the front rank of activity in this department. Stocks of most kinds, both of rags and waste paper, seem to be not overplentiful.

NEW YORK MARKETS.

New York, November 12—(Special Correspondence). —Holidays have served to slow up business somewhat in New York this week, most local paper jobbing and mill selling firms being closed on both Tuesday and Friday, but reports generally, tell of continued activity in the paper industry as a whole, with the tone of prices quite firm. Advices from mill centres are of very en-

couraging character. Paper and board mills in numerous cases are operating at full capacity, and it can be said that mills in general are to-day running on a larger scale of production than probably at anytime thus far this year. Moreover, demand is of sufficient volume to absorb practically all of the current output, while some manufacturers are succeeding in moving a good part of their surplus stocks of paper.

Developments in the form of important market changes have been lacking during the week. Prices on all grades of paper hold steady at about previous levels, though it can be stated that the tendency of paper values is still strongly upward in a majority of instances. The newsprint market is firm, with mills steadily increasing their production and shipping out larger amounts of paper. Consumption of print paper was quite heavy during the pre-election period, and now that Election Day is past, everything is in favor of an uninterrupted increase in consumption during the next few weeks when department store and other advertising in the daily newspapers for the pre-Christmas season usually is heavy.

Quotations on newsprint are holding firm. Spot shipments of roll news are freely bringing around 4.25 cents per pound at mills, with reports received of an occasional sale at higher levels, it being stated that newsprint has sold in some cases up to 4.50 cents. The contract price basis is steady at 4 cents a pound f.o.b. mills, and while there is considerable talk in the trade regarding a probable decline in quotations, it seems hardly likely that any change will be promulgated until after the turn of the year.

Fine papers are in a firm market position, and business in this class of paper is constantly broadening. Mills in the Holyoke district are operating on a larger scale at present than in many months and are reported finding a ready outlet for the bulk of their production. Prices show a hardening tendency, and there are many who expect to see further advances in bond and ledger papers, especially since raw material is steadily increasing in cost. There seems little doubt that the sharp rise in bleached sulphite prices, effective December 1, will serve to strengthen quotations on various lines of sulphite bonds, and the rising cost of rag stock is having influence on rag bonds.

Wrapping paper is enjoying a good demand. Consumers are buying in more or less consistent fashion and are absorbing aggregately sufficient tonnage to keep mills well engaged. Prices on No. 1 domestic kraft wrapping are firm at around 7 cents per pound, with the leading producers freely obtaining this figure though with manufacturers of some of the secondary grades of kraft booking orders at a quarter to a half cent per pound under this basis. Tissues are firm in price and in good demand. Mills are rushed with orders calling for quick deliveries, which shows that buyers want tissue paper for the pre-holiday season. Coarse tissues are moving in large amounts and at steady quotations, there being a particularly good call for towels and napkins.

Book papers have quieted down somewhat. It is difficult to explain why, unless publishers have covered their requirements through recent purchases and are now holding back in augmenting their supplies. This much can be said: That consumption of book papers is steadily mounting and the outlook for continued expansion in this branch of the paper market is very favorable. It would seem therefore that the quieter condition of the market is nothing more than temporary, and that as soon as publishers consume a bit more of their present stocks of paper they will again enter the market as buyers on a larger scale.

Boards also have quieted down to an extent; that is, as regards fresh demand from consuming quarters. The mill situation has thus far been little affected, however, as most board manufacturers have enough orders on file to keep them busy for several weeks to come. An official of one of the largest board mills in the East stated several days ago that his concern has ample business in hand to absorb the entire output of the mill for the balance of November and a part of December. Board prices are at a wavering point. There has been no recession lately, but indications are not wanting that unless demand increases soon, quotations may be altered in a downward direction. This applies especially to plain box boards. Plain chip is quoted at about $38 per ton f.o.b. New York, and news board at $40 to $42.50 f.o.b. this city. There is a steady call for folding box boards and for board for corrugating, inferring that manufacturers of folding and corrugated boxes are busier than those producing set-up paper boxes.

GROUND WOOD—Ground wood is firm and, if anything, prices are slightly higher. Sales of foreign ground wood have been reported at $32 a ton, ex the dock at this port, recording a slight rise, and it understood that a majority of domestic grinders are obtaining better than $30 per ton at mills for mechanical pulp. Some grinders are asking up to $35 a ton f.o.b. producing plants, and sales at this basis are said to have been accomplished in cases where the consumer has been located close to the producing mill. Reports continue to tell of grinders having difficulty in operating because of low water, and it is doubtful that production is anywhere near normal, which in itself is a strong market factor.

CHEMICAL PULP.—Chemical wood pulp is in a firm market position and the trend of quotations is distinctly upward. The sharp advance announced in bleached sulphite prices, to go into effect on December 1, serves to have a strengthening influence on prices on all grades of sulphite, and sellers have marked up prices on easy bleaching sulphite, it being anticipated that with bleached sulphite higher paper makers will seek to purchase larger amounts of easy bleaching. Between 3 and 3.25 cents per pound f.o.b. pulp mill or ex dock is the prevailing quotational range on easy bleaching sulphites, and a majority of sellers ask the higher figure. Kraft pulp is steady and moving freely. Domestic producers are obtaining 3 cents a pound for No. 1 kraft, and down to 2.75 cents on secondary qualities, while importers quote between 2.65 and 3 cents on Scandinavian kraft, depending on the quality of the lot involved and the tonnage wanted. There is also a steady movement of news grade sulphite at from 2.50 cents upward at pulp mills.

RAGS.—The papermaking rag market has been devoid of important activity this week. Mills have let up in their buying, and most of the shipments made by dealers have been on back orders. However, prices have held steady with the exception of those on roofing stock. Roofing rags usually the first to feel any reaction in papermaking rags, have receded just a trifle as a result of the narrower demand from consuming quarters, and where felt mills a week or ten days ago were obliged to pay around 1.15 cents a pound f.o.b. New York for mixed satinets, to-day they can buy at $1 per hundred pounds, with the probalities favoring



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PAPER STOCK.—Low grades of waste paper are holding steady in price in the New York market, but high qualities evince an easing tendency. There has been a sharp decline in quotations of flat stock, due, it is said, to the retirement of most Middle West book paper mills as buyers. Old No. 1 heavy books and magazines are available to mills at around 1.30 cents a pound f.o.b. this city, representing a drop of some $4 or $5 per ton within the last few days. Shavings also are on the down trend, with offerings by dealers of No. 1 soft whites reported at 3.35 cents New York, and of No. 1 hard white shavings at 3.75 cents per pound. Old folded newspapers rule unchanged at an average of 67½ cents a hundred pounds at shipping points, and there is a steady movement of No. 1 mixed papers at a price range of between 55 and 60 cents per hundred f.o.b. dealers' points. Old kraft is off a trifle in price, dealers now asking 2.15 to 2.25 cents a pound.

OLD ROPE AND BAGGING.—There is a consistently good demand from paper mills for old manila rope and prices on this commodity hold firm at between 4.75 and 5 cents per pound at dealers' shipping points, with sales actually recorded at just a trifle below 5 cents. Mixed strings are in better demand and are selling at 85 to 90 cents a hundred pounds f.o.b. New York. Old bagging shows little fresh improvement in point of demand and prices are generally unchanged at 90 cents to $1 per hundred pounds for No. 1 scrap bagging and between 1.10 and 1.15 cents a pound on No. 1 gunny bagging.

FOREST FIRES BURN THE FUTURE.

Every good citizen should know what forests mean to Canada, to his province, and to his very home; and that every fire that burns in the forests is a detriment to the progress of civilization. Every boy and girl should have instilled into their minds the untold damage that may result from carelessness with fire in the woods. In destroying the forests we are not only damaging the present, but are literally burning up the future.

FUTURE OF FORESTS OF NEW YORK TO BE IN PAPER INDUSTRY.

Utica, N.Y., Nov., 11.—"The future industrial story of the New York State forests will be told more through the manufacture of paper than in the maintenance of the lumber industry, and for this reason the American Paper and Pulp Association, through its Woodlands Section, is anxious to co-operate with the Empire State Forests Products Association in its work for the maintenance of the timber industry.

"This was the statement made by Secretary O. M. Porter, of the Woodlands Section, himself a technical forester, in attending the annual convention to-day of the Empire State Forest Products Association.

"The paper industry," he said, "has, through its Woodlands Section begun some important work in the compiling of statistics relative to the forestry problem, and the Woodlands Section of the American Paper and Pulp Association is composed of the woods department officials of the paper companies which have probably gone farther in the reforestation of cut over lands than any other industry.

"One of the most important recent tasks of this Section has been the compilation of statistics showing the cost of artificial deforestation as practised by paper companies. The first definite statistics showing the advantage of motor equipment in the woods, over horse hauling of timber, were given at a meeting of the Section in April, when various wood operators gave comparative ton mileage by motor vehicle and tractor.

"A specific example of the work now being done is the collection of quarterly statistics showing the amount of pulpwood being cut in all portions of the country, and the amount being used, and these figures are sent to all members of the Section who co-operate in this work."

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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Que., November 24, 1921. No. 47

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

Subscription to any address in Canada, United States and British Empire, $5.00 yearly. Other Countries Postage Extra. Single copies, 15 cents.

Changes of advertisements should be in the Publishers' hands ten days before the date of issue.

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EDITORIAL

THE UNITED STATES TARIFF.

On another page of this issue will be found an article by the Honorable J. W. Fordney, the author of the tariff bill which is now before the United States Senate. In this article Mr. Fordney sets forth the argument for a protective tariff and it is interesting to note that he compares manufacturing conditions in the United States with conditions in countries with seriously depreciated currency and ridiculously low labor costs but that he proposes to apply the same rate of import duty as for other countries to goods from Canada where labor and manufacturing costs are as great and in some cases greater than in his own country. His argument is that a scale of wages and the standard of living in the United States must be maintained at decidedly higher levels than in European and Asiatic countries. It would seem that if the standard of living, to which North America has become accustomed, is to be maintained, it could best be done by intelligent, friendly co-operation between Canada and the United States rather than by establishing a basis, or at least an excuse, for retaliation in tariff measures.

One of Mr. Fordney's arguments for high protective tariff, and at the same time a reason why Canada has no cause for complaining against the measures proposed in the Fordney bill is his statement that Canada collected $19.50 last year in import duties for every member of population (based on 1911 census, evidently), that Great Britain collected $16.50 per capita while the United States collected only $3.15. The author of the United States tariff bill however, does not further analyze this feature of International trade. He does not bring out the fact that the United States produces such enormous quantities and varieties of goods that comparatively little need be imported and that such duties as are collected on imports are spread over the enormous population of about 110,000,000. On the other hand Canada is obliged or, at least, inclined, to import even a greater amount than is exported, and that per unit of population the value of imports is inordinately large; they spread over a population of less than 8,000,000 and we necessarily have a figure which, per capita, looks large, but which, when properly compared with United States figures, is relatively only about one half of the amounts derived by them while it puts an additional burden on each person in Canada amounting to about 6 times the burden of import duties borne by our friends across the line. It is a mistake to assume that tariff revenue is entirely a benefit. It is not so much income as a national expense.

The statement is made in the article that the American people are demanding tariff revision. That is probably true, and it is probably also true that the majority of the people if consulted individually would recommend that the revision be in the direction of lowering rather than raising rates of duty. We venture to suggest that the same applies to Canada. Mr. Fordney repeats a rumor that Canada may retaliate. It may be called retaliation or it may be called reciprocity. The two countries are bound to conduct their fiscal policy each with regard to what is done by the other. As soon as one country takes a step which puts the other at an industrial or commercial disadvantage, as surely as the sun sets on that day, the other will plan some means of at least compensating for any disadvantage which it may suffer. The trouble is that, in attempting to neutralize these disadvantages, the tendency is to put a bit too much weight on the other side of the balance.

It has just been announced that President Harding will not appoint the commission which was to have approached the Canadian Government in regard to the export restrictions on pulp wood cut on Crown lands. The reasons for this decision are not stated but the result in any case will probably be that at least one clause of the Fordney tariff will not become operative.

Readers of the magazine will of course, have their own ideas on tariff matters and they will find much of interest in Mr. Fordney's contribution.

WASHINGTON ON THE WASHINGTON CONFERENCE.

Perhaps the most important feature of the Armament Conference, now in session at Washington, is the lack of animosity among the delegates and the apparent determination, in a friendly way, to arrive at definite action that will at once be a relief from the burden of unnecessary armament and a source of confidence for immediate progress in paths of peace. The feeling seems to be growing, that if every nation limits its armaments to what are required for defence, there would be none with strength for attacking another.

Great Britain, with characteristic candor and faith in the good that is in men, has suspended work on a large battleship construction program. It has been pointed out that money would be saved by the support by the government of persons thus deprived of work. That is true, for it would make coal and steel available for factories now, and would hold in peaceful pursuits the young men who would be the future crews, and they would be paid wages by people who get something in return rather than through taxes that go to pay for the maintenance of what should be a useless show of force.

In view of the aims of the Conference a quotation from a letter written by George Washington to the Marquis de Castellux, who had been a major-general under Washington in the army of Rochambeau during the American Revolution ,on the event of the Marquis' marriage, in 1788, will be in order.

The great American said: "Certainly it is more consonant to all the principles of reason and religion, natural and revealed, to replenish the earth with inhabitants than to depopulate it by killing those already in existence. Besides, it is time for the age of Knight-errantry and mad heroism to be at an end...For the sake of humanity it is devoutly to be wished, that the manly employment of agriculture, and the humanizing benefits of commerce, would supersede the waste of war and the rage of conquest; that the swords might be turned into plowshares, the spears into pruning hooks, and, as the Scriptures express it, the 'nations learn war no more'."

NOW IS THE TIME TO BOOST.

As intimated in a news paragraph last week, there is a tendency on the part of some speakers belonging to one of Canada's political parties, to make a feature and an argument of the fact that the Riordon Company owes the Dominion of Canada a large sum on account of taxes. It has recently developed that other Canadian firms are also in arrears and some of them to even greater amounts than the Riordon Company. The attitude of the Government in appearing willing to give the company a chance to recover from the unfortunate predicament into which it has fallen because of the general business depression, and for other reasons, is good business.

The policy of the Government in this respect was followed by the majority of other creditors of the company at a meeting held in Montreal last week when it was voted to give the company an extension of time on accounts until November 19th, 1922. After all, business cannot succeed except on the basis of mutual helpfulness and confidence. The vote of the meeting last week is an expression of the confidence of business men in the soundness of the Riordon Company's physical assets and in the integrity and ability of the men at the head of the company, particularly, we believe, in Charles Riordon and Carl Riordon who have well earned an enviable reputation for absolute honesty and unquestionable sincerity. It is not only a compliment to the Riordon name that is implied in the actoin of the company's creditors; it is their just due. If the affairs of the company are to be straightened out to the satisfaction of its creditors, we believe that success must come through the efforts of the man who has been instrumental in the building up of the company. We have no doubt of his ability to pull the thing through.

The affairs of the Riordon Company amount to more than just the incidents relating to this concern. They affect the whole Pulp and Paper Industry of Canada and incidentally of other countries. The Pulp and Paper Industry of Canada as well as other industries have been passing through a critical period and the light does not yet shine full though the skies are brightening. It is in these rather cloudy days that sympathy, confidence, and help are needed by all of us and we fully believe that with each one now lending a hand, the future can be faced with strong faith in the ability of the principal manufacturing industry of the Dominion of reassert itself as a strong and prosperous unit in the industrial life of this continent.

Now is the time to boost.

FORESTRY. REPORTS.

A couple of weeks ago there arrived almost in the same mail, a report of forestry conditions in the United States particularly with relation to the production, importation and consumption of pulpwood in the United States for the year 1920 and the report of the Director of Forestry in the Department of Interior for Canada for the year ending March 31st, 1920. Thus we see that while nine months had elapsed between the ending of the year reported on and the appearance of that report from across the line a period of 17 months had passed before the report of the Director of Forestry for the year which ended March 31st 1920, was available.

It is seen that both of these reports were delayed in the printing more than is necessary. To be of greatest value, statistics should appear promptly and it is to be hoped that future reports can be had soon enough so that quotations from them will apply to events within the memory of the reader.

In the report of the Director of Forestry, there are a number of very interesting items. For instance, in his introduction, Mr. Campbell mentions the amounts expended in other countries on Forest Management and Protection. He shows that revenues received increased from $23,444 in 1914 to $127,975 in the year under review. He predicts that in time our forests will make financial returns commensurate with those secured in Europe. In France, he states, the expenditure on state forests is $3,000,000 or $1 per acre and the revenue is $4,800,000 or $1.60 per acre. In Hesse there is a net revenue over expenses of $5.32 per acre and in Saxony an expense of $3.33 per acre brings in receipts amounting to $6.35 per acre. In Switzerland the net annual returns range from $3 per acre in the forests where less is expended to $4 per acre where most is expended.

After reviewing statistics relating to the forests and giving a general account of tree planting, recreation, grazing, improvements, protection and the like, in general and for the various divisions of the forestry work, we come to the report on the Forest Products Laboratories. This report shows that a great deal of valuable work has been in progress and much has been accomplished which is of greater service to the people of Canada than the ordinary individual is likely to appreciate.

A review of the report on Pulp and Paper Statistics for the United States will be given in another issue.

The Need of a Protective Tariff

By Hon. J. W. FORDNEY,
Chairman of House Ways and Means Committee, United States Congress.

The House of Representatives recently passed two great revenue measures, now before the Senate—the general tariff revision and the general revision of our internal revenue laws. The Senate has decided to take up the internal revenue bill and pass it ahead of the tariff bill. I think that is a most serious mistake. The manufacturers of this country can pay no profits until they are given the opportunity to make money.

We are importing at the rate of about $300,000,000 worth of foreign goods per month into the United States. Most of those goods could be made here. There is not a manufactured article produced in the United States in which labor cost is less than 90 per cent of the total cost—I mean, following the raw material from start to finish. Now, if that is true, of the $300,000,000 that we are sending abroad each month to buy foreign made goods, $250,000,000 is going out from the people of the United States to employ German, French, English, Japanese and Chinese labor, while our laborers are walking the streets in idleness.

Under free trade we must come to a common level somewhere, if we compete with all the countries of the world. To-day German labor is getting from 60 to 65 cents per day in gold for ten or twelve hours. Japanese and Chinese labor to-day is from 12 to 18 cents per day in gold for twelve hours work. If we had to be placed on a par with the imports from those countries, do you believe we could lift those foreign countries up to our standard of living? Not at all. We have got to come down to a common level somewhere, but we are not ready to do that, and we are not going to do it.

The people of the country are demanding tariff revision. Some people say that Canada is going to retaliate. Canada is the best customer we have in the world, on the basis of population. There is no place in the world where our balance of trade is stronger than in Canada. Canada has no reason to complain about the rates fixed in the new tariff bill; none whatever. I will tell you why. Last year Canada collected $19.50 in import duties for every man, woman and child in Canada. Great Britain, the great free trade country of the world, or said to be, collected $16.50 per capita, or $728,000,000. We collected $3.15. Little Japan is collecting at the rate of 20 per cent, ad valorem, upon all her imports, dutiable and free. We have the lowest duty of any principal country on the face of the earth right now, and have had since 1913. One year, under the Payne tariff law, we had the greatest volume of imports of any year in the history of the republic up to that time—$1,812,000,000, and on those imports we collected in round numbers $331,000,000 in revenue import duties. Last year, under the Underwood tariff law, we imported $5,300.000,000 worth of foreign goods and collected exactly the same amount of duty $331,000,000, that was collected under the Payne tariff law on $1,812,000,000 of imports, one-third the ad valorem rates of duty under the Underwood law that were collected under the Payne law. Had we collected the same percentage of duty on imports last year that were provided for in the Payne tariff law, we would have collected a billion dollars of revenue.

We hope that this new tariff bill will curtail imports. We believe it will, but there are no rates in that law that are prohibitive, none at all. We never had and never will have a tariff law that will be an embargo in imports. It would not be wise to do it. Wise men will not adopt such a law. But what we do want is to get just as near as possible in imposing an import duty on foreign goods, one that will bring the cost to the foreigner up to the level of our cost of production in this country.

No American is afraid of any foreigner, unless under our laws that foreigner has an advantage over him. The American is ingenuous enough to hold the business of this country, unless you give his competitor an advantage over him. That is what we are afraid of, having the rates too low.

Way back in 1879 we had a provision in the tariff law to collect ad valorem duties on the American valuation. There was a future time fixed for that law to take effect, but before it took effect the great influence of the importer brought to bear induced Congress to repeal that provision of the law.

Some people are opposing American valuation, some of the great importers of the country. Some of them have sent out circulars appealing to the merchants of the country, the manufacturers, to appeal to their congressmen and their senators to oppose American valuation. Why? I will tell you why. Last year in the customs office of New York alone there were fifty-four hundred cases of under valuation, and this year they are running at the rate of five hundred cases a month.

Why do foreigners who export to this country or people of this country who import from foreign countries undervalue? Because they pay less duty. Profit is made in the duty if they can import at fifty cents on the dollar of the real value of the goods.

They say we cannot take care of some articles of import because we do not know their values. How ignorant we are. We now accept the foreigner's statement. Why not accept our own? Haven't you got more confidence in yourself than you have in a foreigner?

There is another good reason why we should have American valuation instead of foreign valuation. There is the exchange value of foreign money, a most troublesome question for us, to equitably arrive at the correct values, because foreign moneys have different purchasing values in the countries of their origin than the exchange value over here, and it is most difficult for our customs collectors to determine those questions.

Canadian money to-day has an exchange value in the United States of about 85 cents on the dollar. The English pound, with a par value of $4.86 over there, has an exchange value over here of about $3.72. The French franc with a par value of 19.3 cents has an exchange value here of between six and seven cents. The German mark, 23.8 cents par value, has an ex-

*Consists of American Valuation Association.

change value in the United States of about one cent, but it will buy seven or eight or ten times that value over in Germany. Rates on Nov. 22 were, respectively, in New York, $.91¼, $3.9925, $.0712, $.0036.)

American valuation will fix the valuation upon the gold dollar. Every dollar of our money since 1896 is worth one hundred cents, because it is all redeemable in gold, and we will eliminate those exchange values of foreign money by American valuation. Those are the two outstanding reasons for American valuation.

CHANGING BOARD WEIGHT TO REAM WEIGHT.

In answer to a correspondent's question, as to how to change board weight to ream weight, and vice-versa, the Paper Trade Journal replies:—

Answer No. 2552.—June 1, 1920, the Eastern Paperboard Manufacturers' Association published a booklet giving the gauge and ream weight tables to be used. There are several definitions and rules for figuring box board which are given here:

Bundle.—A bundle of boxboard is a standard package of same weighing 50 pounds.

Number.—The "number" of board indicates the number of sheets, size 26 x 38, in a bundle weighing 50 pounds.

Count.—By "count" is meant the number of sheets of any size in a bundle of 50 pounds.

Regular Size.—The regular or Standard Size of all grades of board, except Patent Coated and Solid Manila, adopted for the United States is 26 x 38, containing 988 square inches.

The Regular or Standard Size of Patent Coated and Solid Manila Board is 24 x 36, containing 864 square inches.

Regular Number.—The regular number indicates the number of sheets, 26 x 38 in size, in a bundle of 50 pounds.

To Determine Count of Odd Size Sheets.—If not sure of the regular number of the board desired, determine same by gauge list. Divide the number of square inches in a bundle of the regular number desired, by the square inches in the special size sheet desired, and the result is the "count" or "number" of the special size desired.

To Determine Regular Number of any Special Size.—Knowing the count of the special size, multiply the square inches in special size sheet by the count, the result being the square inches in the bundle. Divide the square inches of the special size by the square inches in a regular sheet (26 x 38—988), and the result is the "regular number.

Below is gauge list and ream weight table for:

Patent coated—chip back.
Patent coated—news back.
Patent coated—news center Manila back.
Patent coated—solid Manila back.
Patent coated—blue back.
Solid Manila board.

Caliper	Basis 500 sheets 24 x 36 (864 sq. in.)	Basis 500 sheets 25 x 40 (1,000 sq. in.)
Lbs.	Lbs.	Lbs.
.011	154	178
.012	168	194
.013	182	210.60
.014	189	217.60
.015	195	225.69
.016	208	240.70
.017	221	255.78
.018	230	266.20
.019	238	274.88
.020	245	283.56
.021	252	291.66
.022	264	305.55
.023	276	319.44
.024	288	333.33
.025	300	347.21
.026	312	361.10
.027	324	374.99
.028	336	388.88
.029	348	402.77
.030	360	416.65

Rules for Figuring Weight of Odd Sizes.—Use the decimal table above, which is on the basis of 1,000 sq. in. and is accurate. First find the square inches in the sheet wanted and multiply same by the decimal in 25 x 40 table above, then point of decimals and you will have the correct weight of the odd size per ream.

Example.—22 x 34, —.018 Patent Coated. 22 x 34 =748 sq. in. x 266.20=199 pounds per ream.

If you had an order which read 26 x 38—25 you would have a bundle of twenty-five sheets weighing fifty pounds. To change this to ream weight you would have to divide 500 (the number of sheets in a ream) by 25 and multiply by 50 which would make the ream weigh 1,000 pounds.

THE TARIFF: WHY CANADA NEEDS IT.

Under this title the Canadian Manufacturers Association have just published a book of ninety-four pages on various aspects of the tariff question. It is discussed from every conceivable angle and contains a great deal of information which has not been collected in one cover previously. Among the interesting features, is a chapter showing the tendency of many other countries to increase protection. Unfortunately there is not space to quote freely from the many interesting chapters in the work so we commend the reading of it to those who are interested in the question.

A pertinent quotation from Abraham Lincoln which applies quite as much to the attitude of the Canadian buyer as to the question of tariff policy is, "I do not know much about the tariff; but I know this much; when we buy goods abroad, we get the goods and the foreigner gets the money; when we buy the goods made at home we get both the goods and the money."

ALL NOW OPERATED AS PROVINCIAL PAPER MILLS.

The charters of the St. Lawrence Pulp and Paper Company and the Port Arthur Pulp and Paper Company have been cancelled by the Ontario government and the industries, which formerly operated under these names, are now under the ownership and control of the Provincial Paper Mills Company, Limited, of Toronto, which has plants at Mille Roches, Thorold, Georgetown, and Port Arthur, Ont., all of which are busy at the present time and operating to capacity. The company reports there has been a decided improvement in the book, writing and ledger paper business during the past few weeks and that buying is heavier.

Idle Time as a Manufacturing Loss*

During this period of depression and subnormal production this subject is timely and a problem most of us have endeavored to solve.

We hear the statement frequently that when production goes down, costs go up. Do costs go up?

If a company operates two plants in different localities the manufacturing costs in mill No. 1 would not increase because mill No. 2 was not operating. Therefore, the same reasoning applies regarding the cost of paper on one of two machines when the other is idle.

Principal Problem of Cost Finding.

The principal problem of cost finding is to assign the expense or burden so that each production unit shall bear its own share. An examination of the expense item will show that while some remain fairly constant others vary with the volume of the business.

Such items as rent, taxes, insurance and depreciation of buildings do not vary materially, whether the plant is active or not. Such expense can never become zero, no matter how slight the production. Depreciation may be greater when the factory is idle than when it is in operation. Other items of expense are affected by changes in the volume of business. Indirect labor and operating supplies are directly affected by such changes, moving up and down as the production varies, though not in direct proportion to such variations.

It is also important to notice that profits do not vary in proportion with the volume of business. Fifty per cent production does not mean half profits as there is always an irreducible minimum of expense items and if this minimum is high compared with the variable charges due to the activities of the business, a slight decrease in business may cause an operating loss.

Break Even Volume.

In every business, there is a break even volume, that is, every company must manufacture a certain number of units in order to carry the fixed overhead and that amount of direct expense, which becomes necessary to the manufacture of that particular quantity produced.

As soon as the company passes this point, however, the increase in percentage of profits is very marked inasmuch as the fixed overhead does not increase and each additional unit produced decreases the unit of expense cost. Neither does the direct expense increase in any such proportion as amount of production. We must bear in mind that there is a great danger, even in increasing production, for the minute that you have to increase your fixed expenses, then there is a real problem to face. Increased production may only lower costs so long as it can be handled with the present plant and equipment.

Expense may vary according to time, as a large amount of coal may be purchased but the consumption of this coal may extend over a period of months. Extensive repairs may be made to buildings or machinery. These expenses will fluctuate with little reference to the amount of business handled, therefore it would not be fair to current production to charge off this heavy expense against it, as this method would favor either future or past production.

In establishing normal rates we must analyze expenses carefully over a sufficiently long period.

Important Burden Volumes.

Among the important items are such fixed charges as taxes (other than Federal income and excess profits), insurance, depreciation and repairs. Taxes and insurance should be distributed on the basis of the net value of the equipment in each department. This only refers to fire insurance and taxes on the plant.

Depreciation is one of the most important of all the overhead expenses. There are several methods of figuring the amount of depreciation. A simple method for determining depreciation is to estimate the scrap value of the equipment and deduct this amount from the original cost. This difference is then divided by the estimated years of usefulness of the machine.

Repairs are also an expense item for the maintenance of the plant. The repair shop should be treated as an individual unit and each job repaired should be charged to the department for which the work has been done.

The power plant is an important factor and its operating costs form a considerable part of the burden. Each department using steam or power should be charged with its share of this cost. Records should be kept showing the efficiency of the boilers.

Variable charges or controllable expenses such as miscellaneous supplies and non-productive labor are also items of factory overhead. These items should be charged to an account called general factory expense.

When all these charges making up the overhead or burden have been analyzed and carefully distributed to the several departments, a total burden charge for each department can be ascertained. This total divided by the normal operating time established correctly will give a fair burden rate per hour.

Errors in Establishing Normal Rates.

Errors are often made in establishing normal rates over a period of a year. This method under normal conditions would be correct, but in times like the present, when the situation six months ago was entirely different from that of today and with no expectations of that same condition being reached again for a long time. I believe it would be a serious mistake to include figures pertaining to the past period in arriving at present day standards as a measure for future operations.

The setting up of normal charges does not mean that we can abandon the analysis of actual burden costs. The analysis of actual expenses and estimated, reveals an interesting comparison.

Normal hours do not mean possible working hours as many hours are lost during the year, on account of holidays, repairs, low water and similar reasons. In estimating normal hours it is necessary to make an allowance for lost time due to the above causes.

It is generally conceded that eighty to eighty-five per cent capacity is a normal production. I would recommend figuring for standards to be used on this basis.

In order to illustrate this point let us assume that a manufacturer after careful study and taking into consideration present conditions and trend of the times, has established normal rates in the several departments through which his product progresses and he arrives at a beater labor and burden rate of $1.60 per hour, ma-

* Address given by H. A. Wingate, assistant secretary C. H. Dexter & Sons, Inc., before the Cost Association of the Paper Industry at the Drake Hotel, Chicago, October 6, 1921.

chine rate of $5.50 per hour, etc. The books of the company will be operated on costs as shown by these rates during the period decided upon.

Cost of Idle Hours.

As each month passes the costs of actual operation are found and measured against the normal rates and the difference noted. This difference represents the cost of idle hours and is chargeable to profit and loss or an unearned burden account.

For example, let us assume that the actual operating costs per hour over a certain period in relation to the standard or normal cost were as follows: I am presenting a theoretical cost, first arriving at a normal final cost, then showing how the idle hours affect this cost by departments. The normal beater labor and burden cost is $1.60 per hour and the actual cost is $2.40 per hour. The normal machine cost is $5.50 per hour while the actual cost is $8 per hour, etc. The normal final result shows a cost of $0.206 per pound, the actual or increase caused by the idle hours gives us a cost of $.248 or $.042 additional.

Idle Machinery and Reduced Expenses.

There has been in the past and there are still many different opinions as to the correct method of calculating and handling the increased cost occasioned by idle machinery and reduced production. Many companies figure these standards and charge the difference between the cost of manufacturing on that basis and the actual cost direct to profit and loss or an unearned burden account. I strongly believe that there is a great benefit to be obtained by going a step farther than this and show the unearned portion of the expense against the final cost in the manner described. It should always be figured separately, however, so that it will not be lost sight of.

Whether we believe it or not, the fact of having the actual cost before the manufacturer is bound to force him to the realization of the situation and I believe the average man with these figures "boiled down" and placed against the individual runs of paper is in a far better position to meet intelligently the problems confronting him and will make him a better competitor than he would be if he was simply presented with normal cost records, charging Idle Hours to Loss and Gain or some other account.

It is possible some may feel that it will entail too much time and labor to apply the expense caused by Idle Hours to the normal costs.

If records are kept in the proper manner, the additional labor required in doing this would be slight and by far would be more than offset by the benefit derived therefrom.

A manufacturer who has this information before him will have the facts needed in basing his manufacturing and selling policies.

SWEDISH EXPERTS IN MONTREAL.

A meeting of the sulphite section of the Canadian Pulp and Paper Association was held in Montreal during the week in order to confer with three Swedish experts who were in Montreal, namely, Mr. Lundgren, secretary of the Swedish Cellulose Association, and Messrs. Nostrum and Asplund, representing two of the biggest producing companies in Sweden. They came in order to discuss with the Canadian producers international conditions as they affect the industry and they propose to make a visit to representative Canadian mills. They were entertained at a luncheon at the Ritz-Carleton Hotel by the Sulphite Section.

Considerable difficulty will be experienced in Toronto, and possibly in other places, in getting out the voters' lists for the Dominion election in time. Some printers have refused the work, on the ground that they could not take it in addition to their usual work. Besides the printers' strike, and the difficulties which this occasions, it may be mentioned that the lists are twice as long as usual, owing to the addition of the women voters. Thus there will be unexampled difficulty in getting them out by the date fixed, the 2nd December.

COST SHEET

Date 9-15-21
Machine No. 2
Beaters 10
Quantity

Run No.
Grade
Lbs. 9,100

			Normal cost		Actual cost	Increase
Raw and prepared material cost			$1,050.00		$1,125.00	$ 75.00
Beater labor and burden	180 hours	$1.60	288.00	$2.40	432.00	144.00
Machine labor and burden	45 hours	5.50	247.50	8.00	360.00	112.50
Finishing labor	600 reams	.12	72.00	.14	84.00	12.00
Finishing burden	120 per cent		86.40	150%	126.00	39.60
Finishing material			70.00		70.00	
			1,813.90		2,197.00	383.10
Credit 950# broken			28.50		28.50	
			1,785.40		2,168.50	
Selling expense			90.00		90.00	
			1,875.40		2,258.50	

Defects 100
Machine Broke .. .. 400#
Trimmings 450
Total 950

Normal manufacturing cost .. $0.196 lb.
Total normal cost .. .. .. .206 lb.
Normal gain per machine hour, $8.88
Sale price, $0.25 per lb.

Actual manufacturing cost .. $0.237 lb.
Total actual cost .. .. .248 lb.
Actual gain per hour $0.40

Development of Industrial and Scientific Photography

By M. A. COULSON, Industrial Photographer,
Spanish River Pulp and Paper Mills.

Editor's Note:—Mr. Coulson's contribution to the subject of Industrial Photography is much appreciated. This kind of discussion is of the greatest value to the industry. The reader has time to think it over. We trust that a number of them will do so and contribute their ideas on the subject. The pages of the Pulp and Paper Magazine are open to all who have a message to the industry. The aim of its publishers is essentially to improve and to educate.

In an article appearing in the Pulp and Paper Magazine for October 27th, by John H. Graff, Industrial Photographer and Photomicroscopist, suggestions are made as to the advisability of holding a convention or conference among Industrial and Technical Photographers. I assume that this idea is to have expressions of opinion from those of us who are especially interested in the question of Industrial Photography and hence I am writing to back up Mr. Graff's suggestion. I am very glad indeed that he has "started the ball rolling," and submit a few observations which I have made during the past few years, thinking possibly they may help Mr. Graff and others who are as interested in this question as I am. The conference suggestion, it seems to me, is a splendid idea and an exhibition of technical and industrial photographs as well as lectures would prove very useful to the many concerns that have established permanent photographic departments, or that might have them to their advantage.

Photography as applied to industry has come to stay and has justified the establishing of a department of its own in many commercial organizations to-day. I believe it will soon be necessary for our technical schools to adopt a general knowledge of photography as practical for engineers, surveyors and others. Photography of the future is to play a very important part in scientific research, according to all indications. Photography as used in the operation of a large industrial plant leads to the better efficiency of all departments; at least I have found this true. A photographic survey made during the construction of a plant and its extensions makes a thorough indisputable history of the highest educational value. By the taking of photographs at suitable intervals, by dating and filing them, a complete history of the progress of constructional work in a plant may be obtained in a permanent pictorial form. These photos may be found to be of great value in the event of sudden disaster, which may at any time lead to great changes. This type of photography is distinctly technical and far removed from what is known as "Snapshotting." Indeed, a person may be well skilled in some branches of photography and yet prove unsatisfactory in carrying out photographic work of this nature. The engineer who believes that he has only to buy a camera and follow a book of given instructions in the taking of valuable photos is somewhat comparable to the man who, by the aid of a dictionary endeavors to translate a language, the grammatical background of which he has no knowledge. This branch of photography requires special and really scientific experimentation. It cannot be learned over-night. Photographs showing the detail and general progress of construction give more complete evidence than any short verbal description could do and these photos must be carefully taken.

In the case of accidents, which happen from time to time in large industrial plants, in spite of preventive methods, the photographing of the scene and its details is essential, although of course nothing should stand in the way of rendering immediate aid to anyone suffering from injury. The filing of a complete photographic history of events of all kinds is of inestimable advantage to any industry. It is not that it simply provides information that may be of use to those connected with the management, but it often saves disputes with all their attendant troubles and expense, and if an action at law is unavoidable it is the means of much valuable evidence.

Photographic mapping and surveying is a long and important step in the right direction. Photography offers the advantage of giving the whole view of the subject and at the same time the details at a glance. This renders possible what would be entirely impossible at times by the more usual methods of topographical surveying. The time is past when it is possible to doubt the application of photography to this purpose. With the advent of flying machines we have seen revolutionary changes in aerial work. The writer has had some experience in aerial photography, although of an experimental nature. The "Birds-eye view" has always been a favorite for revealing to the best advantage the entire formation and location of large plants and other large objects. Heretofore such views have usually had to be drawn by an imaginative artist. It has been proved that aerial photography can be used to great advantage in locating pulp-wood throughout our timber areas. With a photographic map as a guide we have a working basis superior to the best draftsman's diagram, for it provides a wealth of detail whereby the Forester and his men may definitely locate timber and streams. It makes possible the rapid photographic survey of large limits which were very difficult to cover by the ordinary surveying methods. Lake and river surveys are made easy by aerial means and will show at a glance the available sources of water supply and the quickest way of utilizing the same.

There is also a field of large scope in scientific pohtography in research work. A great deal of useful and interesting knowledge may be gained by means of photo-micrographs. The photographing of objects which are invisible to the eye because of their minute size has been made possible by photographing through a microscope. Although this idea is not a new one, yet some of the finest photo-micrographic work has been done during the present generation, as is well known. Photo-micrography provides us with a means of spreading knowledge concerning microscopic bodies much better than can be done by direct microscopy itself. By the application of photo-micrography to facts hitherto hidden to the unskilled, untrained eye, we have been able to convince the uninitiated of the importance of certain truths.

The growing importance of photography from every

point of view, educational, industrial, and scientific, is not realized as it should be. If it were, photography would not be left to so few specialists, and to such a comparatively large number of those who regard its practice merely as a pastime or an amusement. Doubtless, the substance of remarks of the writer are known to many, but it seems to me that only by the free interchange of ideas in this field can we make real and lasting progress.

REPORT OF THE T.A.P.P.I. SODA PULP COMMITTEE.

By G. K. SPENCE, Chairman.

Arrangements were such that time was to have been very much limited in Washington, and the Soda Pulp Committee had not made very elaborate plans for work at this meeting. It was understood that the work laid out by the Bureau of Standards would exhaust about all of the time allotted for papers and discussions in the general assembly.

It was, however, arranged by the Soda Pulp Committee to have a conference some time during the evening at Washington, which was to have been in the nature of a symposium on "Recent Developments in Soda Pulp Washing."

Mr. Morrison of the Oliver Continuous Filter Company, was to present a paper on results obtained by use of continuous filters on washing black liquor from soda pulp, giving figures showing results obtained in mills where this system of washing has already been installed. This paper was to have been followed by a discussion on this very important question, and if time had permitted, other subjects of general interest to the soda pulp manufacturer would have been discussed. Since it has been deemed advisable to cancel the fall meeting, Mr. Morrison has arranged to have his papers published in the trade papers in the near future.

The Soda Pulp Committee is now planning to have a doubly interesting meeting in the spring in order to make up for what we have missed by cancelling the fall meeting. The same idea will be carried out that was inaugurated in New York last April. Each member of the Committee will be requested to write a paper on a subject of interest to the soda pulp manufacturer, and all papers will be discussed at a soda pulp conference to be held some time during the meeting. The program will be so arranged that all members will have advance notice of the time of this conference and such a time will be selected that will not interfere with any member attending any of the other conferences in which he is interested.

My associates on the Soda Pulp Committee for the ensuing year are: Messrs. Martin L. Griffin of the Mount Hope Finishing Company, Grellet N. Collins of the Dill and Collins Company, Wallace H. Howell of the New York and Pennsylvania Company, George M. Trostel of the Champion Fibre Company, and William S. McClelland of the P. H. Glatfelter Company. These men have all had long and varied experience with soda pulp manufacture and their papers should elicit interesting discussions.

The sulphate pulp mill of Clarke Brothers, at Bear River, N.S., has resumed operations after a shut-down of several months.

RIORDON CREDITORS GRANT EXTENSION.

The formal meeting of creditors of the Riordon Company, Limited, which was held Nov. 17th, unanimously ratified the proposal of the company for an extension of credit of one year to November 19, 1922. The original proposal was slightly amended, inasmuch as it now contains the names of the three new members of the creditors' committee, as mentioned hereunder, and also contained a clause to the effect that present rights of the Dominion and Quebec Governments be preserved in the plan as they exist.

The meeting was originally convened in the office of Gordon W. Scott, trustee, at 11 a.m., but was immediately adjourned to the Windsor Hotel. There was a large attendance of creditors, upwards of 200 being present.

Nothing of extreme interest transpired apart from the vote on the proposal. The meeting elected Mr. Scott to act as chairman of the meeting, and following reading of the minutes of the first section of the meeting, he prepared to answer any questions which might be asked him. In a reply he stated that the extension asked for covered all debts of the company for one year. He also stated that obligations, originally made as carrying interest, will continue to do so.

Mr. Scott referred to a printed statement of the company's position, explaining the various clauses. The statement, in balance sheet form, dated August 31, 1921, shows total estimated liabilities as expected to rank at $6,761,782, and total estimated assets at $24,639,088 leaving estimated surplus assets of $17,877,306. He pointed out, however, that while this statement was correct so far as a liquid company was concerned, in the case of bankruptcy there would be nothing left for creditors, inasmuch as estimated surplus from securities in hands of creditors of $24,423,798, would be more than eaten up by value of securities, $47,571,256.

The appointed scrutineers then took up the ballot cards, and while they were unable to present a full count of the ballot, it was stated that all votes cast had been in favor of the proposal of extension, and not one vote had been cast against the plan.

At the meeting the day before of creditors, preliminary to the formal meeting of today, a number of interesting developments took place.

The retirement of F. P. Jones from the executive committee of the Riordon Company, Limited, has resulted in the addition of three new members to the committee, thus enlarging it by two. Montagu Davy, chairman of creditors' committee, N. W. Wilkinson, representing the Union Sulphur Company, New York, and W. S. Sample, representing the Fuller Company, Montreal, are the three new members. These two latter members have also been added to creditors' committee, H. A. Elliott, K.C., has succeeded R. C. McMichael, K.C., as advisory counsel to creditors, the latter's partner acting on behalf of bondholders.

I. W. Killam, president of Royal Securities Corp., supplied the bulk of information to the meeting, as presented hereunder.

Probably the most interesting constructive development which has been attempted on behalf of the Riordon Company, Limited, has been the re-opening of the Kipawa Mill, the largest pulp producer of the organization. The operation of this plant has met with such a degree of success that it has been decided by the committee in charge to re-open the Hawkesbury plant. The sales staff have been particularly fortunate in sel-

ling out the Kipawa capacity and they allege that they can do the same things as regards Hawkesbury. Providing they are able to get sufficient initial business, the mill will open. It is also intimated that following this attention will be turned to the other plants of the organization, including the American plants. At the present time the pulp produced is being sold at a price which assures a small profit with inventories brought down to cost. At present rate of operations it is expected that the supplies of materials on hand will be brought down to exhaustion before the spring log drive of 1923. This will mean that the company would then be in a fairly good position physically. The Gatineau mills have been producing lumber all through the summer, although they were closed at times owing to the low water and the fact that logs could not be brought down without trouble.

It is entirely probable that some new financing will soon be attempted on behalf of the company, through the medium of creditors and shareholders. The plan at present under consideration is for the raising of a loan of $1,500,000, or thereabouts, asking unsecured creditors and preferred shareholders to contribute at the rate of 10 per cent of their claims or holdings. This would mean that creditors would contribute about $400,000 and preferred shareholders the balance. This issue would be secured by segregation of the Gatineau assets and placing them up as collateral.

There seems to be no doubt that the Edwards and Gilmour & Hughson interests will do all in their power to help the company, by granting further extensions from time to time, but without written agreement. These interests already have had to put up moneys to protect the properties. Proceeds of any new issue would be used to clear up immediate indebtedness on these properties, as well as to bolster up working capital, and it is stated that with this money, the company could carry on uite well, providing the pulp market continued reasonably good.

It is also stated that the attitude of the American bondholders towards the company is friendly. As acting on behalf of other bondholders these interests must be expected at all times to look after their interests as a matter of business, and they will not allow these interests to be jeopardized in any way.

It is understood that all bond interest has been paid up to last June and July. New financing would help the coming bond interest, which it is the ambition of those in charge of the company, as well as the necessity to maintain. There falls due on December 1st, $240,000 in United States funds; January 1st, $120,000 in United States funds and $55,000 in Canadian funds, making $415,000 in all.

The meetings of the creditors brought out the fact that at the present time there is no manager of the company. Creditors committee pointed out that they were open to suggestion for a good general manager who could take full and practical charge of operations. This would be a high salaried executive as the position was one of considerable responsibility.

The point is also brought out that any judgments against the company which have been taken have not been paid, and with the granting of the year's extension, all creditors rank on the same basis.

Summed up the creditors meetings have revealed a marked change in the Riordon outlook. The granting of the year's extension by creditors has secured the liquidity of the organization until November 19, 1922, and the company, although having taken protection under a clause of the Bankruptcy Act, is still a legally liquid entity. The future is dim, of course, although there is a fighting chance to pull through. Much depends upon the condition of the pulp market, although paper men voiced the opinion that improvement rather than unsettlement could now be looked for. It might take two, three, four, or five years to even get to a position where the company would be on its financial feet again, but it was up to the creditors to help this along by giving the company a fighting chance. If they were to force liquidation now they could not get a cent. With the company's mills in operation its credit in enhanced, and bank financing easier to accomplish. At the present time, however, any money which comes in from the sale of pulp is going out again in wages, expenses, etc., netting only a small margin of profit. The work of pulling the organization together, it is impressed upon all parties interested will be slow, but at the present time it is hopeful work.

OVER-OPTIMISM.

New York, Nov. 18.—Warning against undue optimism is expressed in the monthly review of business conditions of the American Paper and Pulp Association, when Dr. Hugh P. Baker, Executive Secretary, called attention to the need of caution in accepting statements that business has permanently turned for the better.

"The outstanding note of the recent business conference of the paper industry at Chicago," says this review, "was an essential but conservative optimism as to the future of the industry. One prominent manufacturer phrased it slightly differently, when he said that this meeting of the paper manufacturers and merchants demonstrated the need of "constructive pessimism" for the next few months.

"The outstanding feature of the conference was the essential optimism as to future business conditions evidenced in the formal address and informal conferences alike. The addresses gave not only optimistic sentiment, but statistical evidence to warrant such a feeling that undue optimism was not to be encouraged, that feeling of constructive pessimism referred to above.

"Every external evidence was that the worst phase of the deflation period was passed, but that minor re-adjustment may be possible before industry in general is fully stabilized."

U.S. PRODUCTION AND SHIPMENTS OF PAPER.

Washington, D. C. — The Department of Commerce it its Survey of Current Business has the following to say regarding the paper industry:

"News print production declined 3.4 per cent and shipments dropped 5.7 per cent in September. Stocks of news print gained 11.5 per cent. Paper other than news print gained 10.6 per cent in September and shipments increased 12.8 per cent. Stocks declined 6.1 per cent.

"Production, consumption and stocks of mechanical wood pulp declined in September. Chemical pulp gained 4 per cent in production and 6.5 per cent in consumption and shipments while stocks declined 8.1 per cent.

A card has just been received by the editor from our friend "Billy" Whyte, who mailed it from Kristiania. Judging by the picture, it is quite some town.

SOME PROBLEMS OF THE SULPHATE PULP INDUSTRY.

Utilization of Lime Sludge.

By CARL MOE, Minnesota & Ontario Paper Company.

One of the problems of chemical pulp mills, using the alkaline process of pulping, is disposal of the lime sludge. There are four ways conceivable by which this by-product may be disposed of, viz:

1. Washing it out in streams or rivers.
2. Piling it on the ground and leaving it there.
3. Reclaiming it by incineration and using it over again.
4. Utilizing it for other purposes.

The first is the most convenient one and probably the one most universally employed. But the contamination of streams and rivers with caustic lime sludge is likely to kill the fish and also make the water unfit for drinking, although this contention has not been proven. In certain states it is prohibited to polute rivers in this manner.

The second method requires considerable ground, according to the size of the plant. If there be a low tract of land available for the purpose close to the mill, the sudge may be conveyed through a system of pipes or open spouts or ditches. Where the location is not favorable for this, it has to be hauled away in specially constructed wagons or cars.

There is no sulphate mill in this country, as far as the writer knows, using reclaimed lime for causticizing, although several soda mills are reported to do so with advantage.

Of other uses for lime sludge there is one which deserves more consideration than it has been receiving in the past. Although it has been recommended decades ago to utilize it as a fertilizer, it seems that very few have acted on this recommendation, notwithstanding the fact that as a dressing for acid soil it stands unexcelled. The writer had the opportunity to observe a striking demonstration of this last summer. Robert K. McDonald, a business man of Stevens Point, Wis., has a model dairy farm right outside that city. The soil around there has a decidedly acid character, and it is customary to apply commercial limestone. Mr. McDonald decided to try an application of lime sludge from a sulphate mill near by—Stevens Point Pulp and Paper Company—for comparison. He had reasoned out that the impalpable character of the sludge ought to make it many times more effective than the coarse commercial limestone. In the fall of 1920 he applied first a top dressing of manure and then with a manure spreader he covered about 27 acres with lime sludge in a ration of approximately 4 to 5 tons of moist sludge to the acre. This field was prepared in the usual manner and planted with corn in the spring. On another field he applied sludge to about 5 acres, which were subsequently planted with clover.

The effect of the application of lime sludge on the corn field has been noted in a case where rows were planted which had not been limed while close by others were planted to which commercial limestone had been applied, and in this case it was seen that commercial limestone had no perceptible influence on the growth, whereas, in another case where the same comparison was made, lime sludge being used instead of commercial limestone, the advanced development of the plants was quite remarkable. When the writer visited Mr. McDonald's farm the latter part of August it was just after harvesting time, and he had then the opportunity to note just as marked a difference between the ears of corn from the field with sludge application and those from the field without sludge application. The latter were green and undeveloped, while the former were full and ripe. It had been an exceptionally dry spring and summer and it had not rained for months, but the soil where sludge had been applied was quite moist a couple of inches underneath the surface, and on no other place had mature ears been developed.

The appearance of the clover fields showed a similar difference. At the places where sludge had been applied the growth was more or less luxuriant, while at places with no sludge application it was scanty.

PUBLISHERS ASSUME CONTROL.

The Watertown office of the Newton Falls Paper Co. has moved to the mill at Newton Falls, N. Y. The mill is now producing 40 tons daily of supercalendered book paper for the use of the owners, the McGraw Hill Co., Inc., and the United Publishers' Corporation, both of New York City. Mr. Arthur J. Baldwin, vice-president of the McGraw Hill Co., has been elected President of the Newton Falls Paper Co., and Mr. Harry D. Eliason, vice-president and treasurer.

The proceedings of the Third Annual Paper Conference at Chicago, have been printed in pamphlet form by the American Paper and Pulp Association. Copies may be obtained from the office of the Association, 18 East 42nd Street, New York City.

The effect of hand to mouth buying by jobbers and retailers in the last few months is noticeable in the stearily advancing market prices of paper. That tendency is marked in practically all branches of the paper trade and is expected to continue for considerable time, according to reliable sources. Even cheaper grades of waste paper material are included in the advance.

With more forest fires reported in New York and other Eastern states as well as Canada last year than for the last thirty previous years, the losses were trifling in comparison as a result of the promptness and efficiency with which they were controlled through protective operations, according to a report made public last Thursday by the New York State Conservation Commission. In the Empire State there were 720 fires reported with a total loss of $49,920, as compared with a loss of $850,000 from 645 fires in 1903, and $800,000 loss from 600 fires in 1908, before the present system of fire protection was established. The area burned in 1921, as compared with previous years, gives testimony of the manner in which the fires handled by the State's protective force. The area burned in 1921 was 25,420 acres, as against more than twice as many acres in 1913.

Solomon said, "Poverty and shame shall be to him that refuseth instruction." Solomon would have ordered a set of Textbooks on the Manufacture of Pulp and Paper. The editor will give particulars.

Mr. F. W. Kellogg, business manager of the Los Angeles "Evening Express", makes the statement that his paper has no fault to find with Norwegian paper recently imported, but that action has been brought against the steamship "Asia" for improper handling of the shipment.

PULP AND PAPER NEWS

The unemployment situation in Toronto is serious at present, and is bound to become increasingly so as the cold weather comes on. Outside the textile and building trade industries, there are few callings indeed which are furnishing full time employment to those working in them. The number of totally unemployed men in the city was estimated last week at 10,000. But this is likely a low estimate. Moreover, the greater number of workers are only working two, three and four days a week — and employment of this kind suffices for little more than just keeping off the wolf from the door. Moreover, the situation is getting worse with marked rapidity. At least 100 men are being added daily to the totally unemployed. These are men who have come back from harvesting in the West or who are drifting into the city from outside points in Ontario, from farms and other seasonal work. Further, there will be a large addition to the ranks of the unemployed as soon as ever construction work stops, that is to say, when the cold weather sets in in earnest. By far the greater number of the unemployed have absolutely no resources of any kind on which to fall back, when they are thrown out of work. As things look at present, this Winter in Toronto will be one of considerable hardship and distress.

Premier Drury has informed Local 91, International Typographical Union, that the Ontario Cabinet is prepared to hear the proposal of the Union that Government printing carry the Union label. The date set for the hearing is the 24th inst. During the summer, the Union committee asked the Government to insist that its printing carry the Union label, giving as instance the arrangement existing in Dakota. The Union's motive, in making this request, is to force a settlement of the strike from several large firms with printing contracts with the Ontario Government.

The Manitoba Power Company has the distinction of being the first notable hydro-electric development of any consequence in Canada under private ownership principles since the war. The plans of the company provide for an ultimate capacity of 168,000 horse power, the first installation to provide for 56,000 horse power. Fraser, Brace & Co., Ltd., in conjunction with the Northern Construction Company, are in charge of the work. The fact that it will be carried out under the supervision of Mr. Julian C. Smith, vice-president and general manager of the Shawinigan Water and Power Co., Ltd., is a guarantee that it will be well done, as Mr. Smith is generally recognized as a very high authority on power installations.

The last week was "Authors' Week", and, in consequence, in very many directions, Canadian authors and their work were brought prominently before the Canadian public. The newspapers, the stores, and many social organizations vied with one another in the attempt to ensure that these Canadian prophets should not be without honor in their own country.

On the 16th instant, officials of the Riordon Company, Ltd., appeared in the Superior Court, in Montreal, before Mr. Justice Duclos, to testify as to their relations with the Ticonderoga Pulp and Paper Company, of Ticonderoga, N.Y., which is being sued by Mr. Percy Cowan, of the Montreal brokerage firm of MacDougall and Cowan, for a sum of over $102,000, the amount alleged to be due on two promissory notes. The Ticonderoga Company denied responsibility for the notes in question, claiming that they had been issued without the knowledge, or authority, of the Company's directors. The notes, it is stated, were issued on the 22nd April, 1921, and were for $50,000 each, interest thereon making up the balance of the claim.

The library department of the Canadian National Institute for the Blind aims at publishing Canadian literature for the blind which will create a Canadian spirit and educate the sightless to a fuller knowledge of their own country. This library, located at 142 College Street, Toronto, is the only one in Canada operating its own press in the publication of books in Braille. The press was presented to the library last April. At present, it is printing "When Canada Was New France," by Dr. George H. Locke, Toronto's chief librarian. The library, which is a circulating and distributing centre for the whole Dominion, catalogues 10,000 volumes in English, French and German, printed in Braille.

Tenders will shortly be called for the extension of the Temiskaming and Northern Ontario Railway for a distance of some seventy miles through a country abounding in pulpwood which, by this means, will be rendered more readily accessible. The extension will likely result in the establishment of some new pulp and paper mills in this territory.

At the inaugural meeting of the Empire Forestry Association, held at the Guildhall, London (Eng.), last week, a resolution was passed urging the extension of a constructive forestry policy to all parts of the British Empire, for the purpose of the scientific conservation and prudent exploitation of the Empire's timber resources for the Empire's benefit. The resolution was seconded by Sir George Perley, Canadian High Commissioner in England.

It was announced, last week, that Mr. F. P. Jones has resigned from the Executive Committee in charge of the Riordon Company, Ltd. During the last few months, Mr. Jones has devoted a great deal of time to the affairs of the Riordon Company, and has succeeded in bringing the Company's position down to a basis where it can be dealt with.

It is expected that Messrs. Brady and Kinsky, organizers for the International Typographical Union, will be in Toronto next week, to continue their efforts for a settlement of the printers' strike. Mr. Brady plans to bring the employing printers of Toronto, Hamilton and Ottawa together for negotiations.

Mr. V. Delvaux works manager of the Belgo Industrial Co., who has severed his connection with the above firm left on Tuesday for Schenectady, N.Y., where he will take a special course before returning to his home in Belgium.

Technical Section

REVIEW OF RECENT LITERATURE.

A-4; A-5. **Moisture Testing of Woodpulp.** Report of the T.A.P.P.I. Committee on Standard Methods of Testing, E. C. Tucker, chairman. **Technical Association Papers,** Series IV (June, 1921). Rules and regulations are submitted concerning the testing of pulp shipments for moisture, based on the work already done by the T.A.P.P.I., the Association of American Woodpulp Importers, the Scandinavian Woodpulp Association, and the Technical Section of the C.P. & P. A.; recommendations are also made concerning conditions not already provided for.—A. P.-C.

A-4; F-0. **Strength Testing of Soda Pulp.** RALPH MAIR and GRELLET N. COLLINS. **Technical Association Papers,** Series IV (June, 1921). Tests on bleached and unbleached gum and popular pulp have brought out the following points: Drying the stock before testing gave lower results in the case of both bleached and unbleached pulp. In general there is an increase of strength up to 35 min. of beating in the Abbe ball mill; but with longer beating the sheets lose their bidrous characteristics and show the effects of parchmentizing, so that no fair comparisons can be drawn from results obtained with more than 35 min. beating. Bleaching does not weaken the pulp when it is preserved in the wet state; but if it is dried before testing there is a decrease in strength after bleaching. The results obtained in determining the effect of the beating time plotted, but the curves obtained were irregular owing to the weak points in the method of testing, which are: inequality of the sheets made with the suction box form, personal equation of the operator both in making and in testing the sheets, varying conditions under which the sheets are air dried giving different moisture contents. Considerable refinement in the method is required to obtain absolute results; and at present two pulps can only be compared in a fair way provided they are in the same condition.—A. P.-C.

A-15; L-5. **Cellulose Dextrins.** M.SAMEC and J. MATULA. **Kolloid-Chem. Beih.,** xi 37-73 (1921); **J. Soc. Chem. Ind.,** xl, 429A (June 30, 1921). Sulphite cellulose is not completely dissolved by 50 percent sulphuric acid, whilst 86 percent sulphuric acid chars it. Solutions of cellulose in sulphuric acid (50 to 85 percent) are at first colorless, but on keeping they speedily become colored. As the degradation of the cellulose becomes greater the coloration produced by iodine changes from blue to violet, then to various shades of brown, and finally disappears; the relative viscosity rises to a maximum and then falls as the swelling and solution increase. In the degradation, dextrins are produced, some of which are soluble in water whilst others are insoluble. The insoluble products are destroyed by sulphuric acid (60 percent and over) within the first half hour. As the degradation proceeds the following changes are observed successively: the dextrin esters are gelatinized by alcohol and the dextrin is precipitated; the dextrin esters and the dextrin are both insoluble in alcohol; the dextrin esters are soluble, the dextrins are insoluble in alcohol: both dextrin esters and dextrins are soluble in alcohol. Phosphoric acid of a greater concentration than 75 percent at ordinary temperatures forms a colorless, very viscous jelly with cellulose which is only slowly changed at this temperature, but at higher temperatures a slow degradation occurs and eventually the solution becomes brown or black. The action of sulphuric acid on cellulose depends not only on the concentration of the acid but also on the relative quantities of acid and cellulose. With a sufficient excess of acid dialyzable dextrins are produced in the first quarter of an hour and at the same time the molecular weight of the collodial residue is reduced. The degradation of both dialyzable and non-dialyzable portions proceeds further by continued action of the acid until after five hours the mean molecular weight of the most coarsely disperse portion is 2400. At the same time the $—SO_4H$ group enters the molecule with the formation of esters. Diastase is capable of converting some of the dextrins produced into fermentable sugars.—A. P.-C.

A-0; R-13. **Analytical and Testing Methods of the Technical Association of the Pulp and Paper Industry.** E. C. TUCKER, chairman of the Committee on Standard Methods of Testing Materials, **Technical Association Papers,** Series IV (on sale by Secretary of T. A. P. P. I., 18 East 41st Street, New York), June, 1921. Methods of analysis and sampling are recommended for bleaching powder, aluminum sulphate, cotton rags, and crown filler. **Bleaching Powder.** Ten percent of the casks should be sampled on receipt of the shipment, by driving a three-quarter inch brass tube through the cask from end to end, transferring the powder to a quart Mason jar, sealing immediately, and quartering the composite sample from the various jars as rapidly as possible in the laboratory. The thiosulphate method is recommended for available chlorine on account of greater convenience than the sodium arsenite method, while it is equally accurate if properly carried out. A test is given for determining the quality of the powder for producing bleach liquor, which consists essentially in preparing a solution of the powder in water under specified conditions, allowing the sludge to settle to the bottom, and titrating the available chlorine in the clear liquor. For determining chlorides, the liquor is boiled with ammonia, acidified wth nitric arid, excess of decinormal silver nitrate solution added, the precipated silver chloride filtered and washed, and the excess of silver nitrate in the filtrate titrated with standard thiocyanate solution. From the total chloride thus found, the hypochlorite found previously is subtracted. For determining chlorate, the solution is boiled with ammonia, reduced by passing a current of SO_2 through the boiling solution for a few minutes, acidified with sulphuric acid, the excess of SO_2 neutralized carefully with permanganate, and the total chloride determined with silver nitrate and thiocyanate as above. The chlorate is calculated subtracting the chloride and hypochlorite previously found. **Aluminum Sulphate.** If the shipment is in packages, samples shall be drawn from 5 per cent of them, and mixed and ground to form a composite sample; if in ingots, fragments chipped off from 12 ingots taken at random shall be taken as a re-

presentative sample. Insoluble matter is determined by dissolving 10 Gm. in hot water, filtering on a Gooch or alundum crucible, and drying to constant weight. Alumina and iron oxide are determined on an aliquot of the above filtrate representing 1 Gm. of the original sample by diluting to 200 Cc., adding 5 Cc. concentrated hydrochloric acid and a few drops of concentrated nitric acid, heating to boiling, adding freshly distilled dilute ammonia drop by drop with constant stirring until a slight excess is present, boiling one minute, allowing to settle, filtering, washing with dilute ammonia and ammonium nitrate, redissolving in hydrochloric acid, oxidizing with a few drops of nitric acid, reprecipitating, filtering and washing as before, and igniting to constant weight over a Meker burner or a blast lamp. Sulphate is determined in the usual manner by precipitating with barium chloride. The filtrate from the alumina determination should be used, as the barium sulphate carries down appreciable amounts of aluminum when it is present in quantity. To determine iron, 5 Gm. of the sample are dissolved in 100 Cc. of hot water, 5 Cc. concentrated sulphuric added, the solution is heated nearly to boiling, permanganate is added drop by drop to a permanent strong pink to oxidize any reducing matter which may be present, the solution is passed through a Jones reductor in the usual manner, cooled, titrated with standard potassium permanganate solution, and the rsults calculated to Fe_2O_3. The basicity or acidity of the aluminum salt and the combined alumina are determined by Scott's method (See **J. Ind. & Eng. Chem.**, vii, 1059, Dec., 1915). **Cotton rags.** The normal moisture content of baled rags should be fixed at 8 per cent. Wherever possible, sampling is to be carried out by putting 10 percent of the shipment through the rag room promptly after arrival, one pound being taken from each bale as it is opened and put through the thrasher, making the samples as representative as possible, and the samples dried to constant weight at 100° cent. When it is not possible to use 10 per cent of the shipment promptly on arrival, 10 percent of the shipment is sampled by drawing one pound from the side of each bale, getting into the bale as far as possible, and the composite sample thus taken dried as above. **Crown Filler ($CaSO_4 2H_2O$).** Specifications recommended are: packed in clean wooden barrels lined with a clean wrapper; color pure white, equal when dried out to C.P. $CaSO_4 2H_2O$, tested purity, not more than 33 percent total water; not more than 15 percent mechanical water; acidity as received not more than 0.05 percent calculated as hydrochloric acid titrated with caustic soda using methyl orange as indicator; free from dirt and iron. Ten percent of the shipment is sampled by boring through the side of the barrel with an auger and extracting the sample with a trier. Moisture is determined by igniting 1 Gm. in a platinum crucible to constant weight. The combined moisture is calculated according to the formula $CaSO_4 2H_2O$, and the remainder is mechanical water. For determining color, some of the dried sample is compared with standard C.P. calcium sulphate by north light. About 3 Gm. each of the standard and of the sample are placed on a sheet of black paper with a straight line division, a sheet of paper is placed over the samples and a penknife is drawn over the paper in the direction of the line of division to smooth the samples; the sheet of paper is removed and the colors are compared. The acidity is determined on 2 Gm. by titration with 0.02 normal sodium hydroxide solution using methyl orange as indicator, and is calculated to hydrochloric acid. The dirt is determined by dissolving in C.P. concentrated hydrochloric acid, diluting, filtering, and comparing the residues left on the paper with similar residues from a standard sample or from previous shipments.—A. P.-C.

E-1. **Analysis of Sulphite Cooking Acid.** ERIK OMAN, **Teknisk, Tidskrift, Kemi och Bergavetenskan,** 1915; **Technical Association Papers,** IV, 1, 61-69 (June, 1921). Translation by Carl L. Fineman and W. E. Byron Baker. A critical review of various methods used for the works control of sulphite cooking acid, with a description of two new methods worked out and tested by the author. The two unknowns to be determined are SO_2 and CaO, SO_3 being unimportant from a cooking point of view. Mitscherlich's method (determination of the specific gravity in terms of degrees (Baumé), Winkler's method (titration of total SO_2 with iodine and of free SO_2 with sodium hydroxide and phenolphthalein in separate portions of the sample), Höhn's method (determination of total SO_2 with iodine and free SO_2 with sodium hydroxide and phenolphthalein in the same portion of the sample), and Stroeb's method (titration with sodium hydroxide using first methyl orange and then phenolphthalein) are shown to be inaccurate even for works control. Determination of SO_2 by titrating the acid into iodine gives the same results as precipitation as barium sulphate, the error not being greater than $\pm$ 0.4 percent of the SO_2 present. If the iodine is titrated into the acid the error is —0.8 percent. The following four methods for the determination of lime have been investigated and found unsuitable: (1) evaporating the free SO_2 on a waterbath and titrating the combined SO_2 with iodine; error —35 percent. (2) Expelling the free SO_2 by boiling in vacuo and titrating with iodine; error + 30 percent to + 40 percent. (3) Adding an excess of hydrochloric acid, evaporating on a waterbath, and determining chlorine; the results were concordant, but too low; error —6 to —19 percent. (4) Adding an excess of 0.1 normal sulphuric acid, expelling SO_2 on the waterbath and titrating the excess of sulphuric acid with 0.1 normal alkali; error —50 percent owing to the oxidation of the SO_2 to SO_3. Oman proposes determining total SO_2 by iodine and the specific gravity by means of a sensitive hydrometer and obtaining the lime content from a previously prepared table. A correction must be applied for the sulphate content of the acid. The error is probably not more than 4 to 5 percent of the lime. The method can be used for raw acid but not for acid containing relief gases or relief liquor. Oman also proposes the following method: 30 Cc. ammonia are added while stirring to 100 Cc. of the clear liquor; after fifteen minutes it is filtered and the precipitate washed three times with 50 Cc. of 15 percent ammonia each time. It is washed into a 500 Cc. volumetric flask, dissolved in 10 Cc. of concentrated hydrochloric acid, diluted to 500 Cc., shaken, and the solution titrated by running into 10 Cc. of 0.1 normal iodine, using starch as indicator. The method was tested on both pure and commercial liquors in which lime had been determined gravimetrically, and the maximum errors were + 10 percent, + 20 percent, and + 2.5 percent for Winkler's, Höhn's and Oman's methods respectively. (For criticism of this method see "Analysis of Sulphite Acid," by A. Sander; translated by Clarence Jay West in **Paper** xxvii 17, 21-23, Dec. 29, 1920).—A. P.-C.

E-1. **Control Analyses of Sulphite Cooking Acid.** PETER KLASON, **Svensk Pappers-Tidning,** xxiii, 11 and 12; **Technical Association Papers,** IV, 1, 71-76

(Continued on page 1197)

UNITED STATES NOTES

Henry Ford, manufacturer of the popular-priced motor car bearing his name, has turned his attention among other things to a practical method of forest harvesting. According to a report from Iron Mountain, Michigan, Mr. Ford is experimenting on a section of timber land two miles from Sidnaw, Mich., where he is putting into execution a plan that may well revolutionize the industries depending upon forests for the basic raw materials. The method is to remove from the tract only the mature trees. Underbrush and waste wood left are to be carefully cleared to protect the remaining trees against fire. The young trees will be permitted to attain maturity. In the meantime they will seed the ground about them, and when they, in turn, are cut, the next crop will have been started. Thus harvests may be made in each of a period of years indefinitely. Sufficient space is left between the growing trees to permit their rapid development. E. G. Kingsford, a member of a Ford company, says concerning the venture and its possibilities: "Mr. Ford is convinced that the public interests demand a fundamental change in treatment of our forest wealth. The inevitable result of the present system will be the denuding of our forest lands. As this denuding continues woods products costs will advance steadily. Finally, denudation will be carried to the point where the need of remedial measures will be realized everywhere. At that time reforestation will be the only hope for the future, and this is a slow and expensive process. The harvesting of trees is a practical alternative. In our present test we cut trees with a minimum diameter of ten to twelve inches."

Increased activities in the pulp and paper mills of the South, as well as in other sections of the country, were reported by Arthur G. Caldwell of the Orr Felt and Blanket Company, Pigua, O., who reached New York last week after having concluded a tour of the principal centres of the country, particularly those below the Mason and Dixon line. Mr. Caldwell says that conditions generally appear to be improved noticeably over six months ago. Most of the mills in the South, he says, are now running on full time or are approaching that condition.

A giant merger, consolidating the King Paper Company and Monarch Paper Company, of Kalamazoo, and the Bardeen Paper Company, of Otsego, was virtually effected at a meeting held early last week in the offices of the Kalamazoo City Savings Bank, Kalamazoo, Mich. The combine will be operated in future under the name of the Allied Paper Mills, and it brings under one management property and plants totalling a valuation in excess of $6,000,000. While the consolidation was culminated through ratification by the directors of the several companies involved, its legality remains to be effected through vote of the stockholders. The combined plants will have a maximum daily capacity of 350,000 pounds of finished paper, while the coating divisions, now the largest of any coated paper concern in the world, can produce about 125,000 pounds of coated stock in twenty-four hours. A. L. Pratt, who has been at the head of the King Paper Company ever since that concern's inception, has been chosen president of the consolidated company. Mr. Pratt is widely known in the paper-making field, being a vice-president of the American Pulp and Paper Association. A. L. Gilman, general manager of the Monarch Paper Company and George H. Gerpheide, secretary and manager of the Bardeen Company, will be vice-president of the Allied Paper Mills. George S. Davis, for many years secretary of the King Paper Company, will be the secretary of the new company. S. B. Monroe has been selected for the place as treasurer. Mr. Monroe is treasurer of the Hawthorne Paper Company and the Mac Sim Bar Paper Company, vice-president and general manager of the Bardeen Paper Company, president of the Northern Michigan Pulp Company, and also a director in several other concerns, including the Provincial Paper Company of Canada.

Prominent in the Japanese Commission of business men now visiting the United States is Ginjiro Fujihara, president of the Oji Paper Manufacturing Company, Tokio, Japan. Prior to his departure for Washington, November 19, Mr. Fujihara with his secretary, Mr. Fukukita, purchasing manager of the Oji Company, and H. B. Wadsworth, manager of the Meishosa Company, visited Albany and Schenectady, making an inspection at the same time of some of the paper mills in the vicinity of Glens Falls.

The Union Bag and Paper Corporation announced last week the declaring of a quarterly dividend of 2 per cent., payable December 15, 1921, to holders of record at the close of business, December 5, 1921.

A wage cut of approximately ten per cent was put into effect at the DePere plant of the American Writing Paper Company last week. It was the second reduction since the end of the war and places wages about on the basis of June, 1919. The mill resumed operations recently after a short period of idleness, and has enough orders to keep it going for over a month. Other mills in the Fox River Valley made wage cuts several weeks ago.

Twenty-two former employes of the Livermore Falls plant of the International Paper Company have been found guilty of conspiracy to injure the company's property. Justice John A. Morril, of the Supreme Court at Lewiston, Maine, who found the decision against the workers, also enjoined the paper workers, forbidding interference with the company's business, inducing others not to deal or contract with the company, interference with free access of the company's employes to its mills, or intimidating, annoying or insulting the employes in any way.

Following a successful meeting, held at the Boston City Club a week ago, the New England Paper Merchants' Association elected the following officers for the ensuing year: President, F. Bendel Tracy, Fort Hill Paper Company, Boston; vice-president, Joseph D. Snell, Von Olker-Snell Paper Company, Boston; treasurer, Albert M. Eaton, A. M. Eaton Paper Company, Waltham, Mass., secretary, Floyd H. Blackman, D. F. Monroe Company, Boston.

(Continued from page 1195)

(June, 1921). Detailed investigation into the accuracy of Winkler's and Höhn's methods for the analysis of sulphite liquor. The results showed that both methods are based on correct conceptions, that the basic reaction of the sodium sulphate does not perceptibly affect the titration, and that both methods give identical results. The errors which occur must be attributed to the analytical chemist, his titration solutions, his readings, and, last but not least, his sampling. Samples should never be taken by suction; the acid should always be pressed up into the pipette.—A. P.-C.

H-5. **Solution of Bleaching Powder.**. M. CHAMPION, **Bull. Soc. Chim. Belg.**, xxix, 24-28 (1920); **J. Soc. Chem. Ind.**, xl, 431A (June 30, 1921). Mixtures of bleaching powder and water containing from 1 to 20 percent of the former were shaken for three hours, allowed to settle, and in the clear supernatant solution the active oxygen, total chlorine and calcium, and the density were determined. If the concentration exceeds 4 percent there is a risk of some of the active oxygen being retained in the residual sludge from the preparation. The figures on the whole show rather higher proportions of calcium and total chlorine to active oxygen than those required by the formula Cl.CaOCl.—A. P.-C.

K-12. **Fulton System of Drying Paper.** WILLIAM B. FULTON, **Technical Association Papers,** Series IV (June, 1921). The main objects to be attained in the efficient drying of papers are: (1) Rapid circulation of steam through the driers; (2) rapid removal of the air and condensate; (3) economical consumption of steam; (4) graduation of temperature on the machine. The rate of heat transfer from the steam to the sheet through the shell driers depend on: (1) thickness of the drier shell and nature of the metal; (2) film of oil and water adhering to the inner surface; (3) air contained in the drier; (4) rate of circulation of the steam and condensate. In the Fulton system a difference in pressure is maintained at all times between the driers and return header, thereby causing a rapid flow of steam through the driers which carries the water of condensation and the air with it. The steam from the dry end of the driers is passed through a separator and is then passed on to the wet end of the driers. At this end all the steam is condensed, and the accompanying drop in pressure causes rapid circulation and high velocity through the dry end of the machine. The condensate and air are removed from the driers of the wet end by means of a vacuum pump. The Fulton system is said to make it possible for mills to decrease their steam pressures 44 percent and 52 percent, also increasing their production 7.4 to 15 percent while some mills are said to cut their steam pressure 44 percent and have decreased their coal consumption 25 percent.—A. P.-C.

K-12. **Ventilation of Paper Machine Rooms.** W. H. HOWELL, Jr. **Technical Association Papers,** IV, 40-42 (June, 1921). In the Briner economizer the hot moist air from the paper machine hood is used to warm up the cold incoming air, the exchange of heat taking place through corrugated plates. Two auxiliary coil fan heaters are provided for taking care of heating on Sundays and during a shutdown. In an actual mill test of the apparatus, the economizer raised outdoor air (at 34° Fahr. and practically 100 percent humidity, during a wet snow storm) to 107° Fahr. in sufficient quantity for all ventilation purposes, the heat units economized being equivalent to 77 b.h.p. continuously for twenty-four hours, without the use of steam. There was a condensation of about 300 gallons per hour. In this particular case, assuming coal at $10 a ton as fired, the net saving is estimated at $26.20 a day. The amount of waste heat going through the roof of paper machine rooms is about five b.h.p. per ton of paper per twenty-four hours.

K-12. **Paper Mill Electrification.** STEPHEN A. STAEGE, **Technical Association Papers,** IV, 1, 30-34 (June, 1921). General discussion of the advantages of electrifying paper mills, as regards laying out of buildings (for a new mill under construction), maintenance of the equipment, power losses, personal and fire hazard, paper machine drive, heat balance, determination of the load at all times by means of indicating and recording instruments, pulp grinder load regulator, preparation of electrolytic bleach ,and use of portable electric welding outfit.—A. P.-C.

K-23. **Imitation-Leather Papers.** P. MILLER, **Papeterie,** xliii (June 10, 1921). Practical notes on the coating of paper for the manufacture of imitation leather.—A. P.-C.

N-4. **Burning of Pulverized Fuel in Paper Mill Power Plants.** LOREN L. HEBBERD, M.E., **Technical Association Papers,** Series IV (June, 1921). A general exposition of the advantages of using pulverized fuel in paper mill power plants, both in new mills and in old mills at present operating with stokers, with estimates of costs and savings. The discussion which followed the presentation of the paper is also given.—A. P.-C.

N-4. **"Bergeon-Frédet" Steam Boiler.** G. A. MAILLET, **Papeterie,** xliii (June 10, 1921). A description the 5,000 h.p. electric steam boilers recently installed at the Frédet paper mill at Brignoud (Isère, and of its methods of operation. It consists of a horizontal shell of sheet steel, the size of which is calculated from the amount of steam required and the variations in the loads. The electrodes enter the boiler through specially designed and patented fused silica insulators, which make a steamtight connection. Each one of the electrodes is in an evaporation chamber consisting essentially of a vertical dome which extends down into the body of the boiler some distance below the electrode The steam is drawn off from each chamber into a common line which goes back into the mail steam space of the boiler, from which it is drawn off in the usual manner through a separator. The pipe connecting the evaporation chambers to the main steam space of the boiler, from which it is drawn off in the usual manner through a separator. The pipe connecting the evaporation chambers to the main steam space of the boiler is fitted with a valve by means of which the production of steam is regulated. If the valve is closed slightly, the pressure in the evaporation chambers is raised slightly and consequently the water level in the chambers is lowered. The degree of immersion is thereby decreased, and also the production of staem. If the valve is shut off completely the water is driven completely out of the chambers, and as the electrodes no longer plunge in the water all generation of steam is stopped.—A. P.-C.

N-6. **Steam Economy in Paper Mills.** R. W. LEEPER, **Technical Association Papers,** Series IV (June, 1921). Report of the T.A.P.P.I. Committee on Light, Heat and Power. Discussion of the economical operation of steam prime movers in paper mills according to the nature and arrangement of the prime movers, showing the total annual cost of steam per ton of daily production for various arangements. The discussion which followed the presentation of the paper is also given.—A. P.-C.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 19th Nov. — The better tone exhibited lately by the pulp and paper industry has been well maintained during the past week. Several of the more important mills are reported to be operating to full capacity. Others are increasing their output. Buying is steadily improving, and it is all to the good, so far as stability is concerned, that none of this is of the speculative kind. Demand for most lines of paper is brisk. Prices are steady, and they are at such a level as ensures a reasonable profit on the products of the mills. That, with the assent of the creditors, a way has now been found to keep the Riordon concern in operation on a satisfactory basis, is a circumstance which will sensibly contribute to the security and stability of the industry as a whole. As has been previously pointed out in this column, the pulp and paper industry is one of the most important units of the industrial fabric of Canada. Had one outstanding member of this important unit been suffered to collapse entirely, the effect on the whole unit would have been harmful. On the whole, the outlook may be regarded as bright. Business is not only better, but the betterment looks likely to be a permanent one. Such is the general opinion among those prominent in the industry, with practically no dissential voice. In every branch of the industry operations are expanding, and the character of the expansion is such as to augur well for the future. It should, in fairness, be added that the practice of "under-cutting" on the part of jobbers, of which mention was made, some few weeks ago, in this column, is now, by all accounts, far less indulged in than it was then. This is all to the good. In fact, looking in nearly every direction, it seems as though the clouds — and some of them pretty black ones — which were overhanging the industry so recently have either dispersed or are in process of dispersal.

PULP. — The mechanical pulp market is more encouraging, and the demand is somewhat better. Chemical pulp is showing a more decided improvement, but sellers are holding off somewhat for better prices than they can get now. At present prices that buyers are willing to give (Canadian mill and in Canadian funds) are as follows: easy bleaching, $60 a ton; extra strong, $62.50 to $65 a ton; news grade, $55 a ton. There is a fairly good demand for kraft pulp and also for strong bleached. The news that the Kipawa plant of the Riordon Company is gradually increasing its output is in harmony with the better tone which the pulp market is certainly evincing. A certain stiffening in prices is regarded as probable. On the whole, the pulp outlook, while nothing to boast of as yet, is still distinctly brighter than it has been for some while.

NEWSPRINT. — The production of newsprint continues to increase. Some mills have enough business on hand to keep them employed at capacity, or near capacity, well into the New Year. Exportations to the United States are increasing in size. The Dominion election campaign has contributed, in many ways, to the livlier demand for newsprint, and not least by reason of the fact that, owing to the interest taken in it, many of the daily newspapers have substantially increased, in both size and circulation. One big publisher, with whom the writer was talking this week, expressed himself as dissatisfied with present prices, which, he maintained, were still too high. But the publishers' view of this question is not apt, as a rule, to be especially emprejudiced. Most of them have doubled the price of their own publications of late years, but seem to expect to be able to buy newsprint at something like pre-war prices. There are newspapers in Toronto which are literally coining money just now. The volume of newspaper advertising is good for this fall season, and if any of them is not making money the fault must be with its methods. A large concern has announced, it is said, a price of $75 per ton for January—March.

BOOK AND WRITING PAPERS. — The demand for book and writing papers is lively and plants are running full time. This is satisfactory in a wide and general sense, inasmuch as it indicates that retail commercial conditions are improving.

FINE PAPERS. — A more optimistic tone prevails with regard to fine papers. Business is picking up, and indications for the future are favorable. But the improvement in this line is not so marked as in some others — a circumstance which is natural enough in respect of a commodity which is less an essential than are some other lines of papers.

WRAPPING PAPERS. — The demand for practically all kinds of wrapping papers is good, and will certainly get more active as Christmas approaches. Indeed, from now on, business in these lines will be as brisk as can be. Talking with the representative of a large kraft mill, the writer was informed that the demand for kraft was excellent and that prospects are, in every way, most encouraging. Sales have recently been effected of some large quantities of kraft, and production is being speeded up.

TOILETS AND TISSUES. — Toilet and tissue mills are running full time. The demand for both is good and the outlook satisfactory.

BOARD. — The improved demand for nearly all kinds of board continues. Plants are busy and prospects look good. This is particularly gratifying as, for a long period, board mills were very markedly inactive.

RAGS AND WASTE PAPERS. — As has been noted recently, the rag and waste paper trade is now quite active. Complaint is heard to the effect that it is difficult to obtain stocks. The plaintive appeal of the rag collector is now being heard with a good deal more frequency on the Toronto streets. The demand for waste paper is far brisker than was the case a few weeks ago, and, as a consequence, prices in some lines have gone up. Hard white shavings seem to be most in demand.

NEW YORK MARKETS.

New York, November 19.—(Special Correspondence) —Trading in paper of most grades has slowed up somewhat this week in New York. The market as a whole displays no important change, but reports from representative merchants and mill agents in this city

have been that buying has been of smaller volume than in quite a while, this being due, it is pointed out, to a combination of circumstances. One reason for the quieter position of the market is, that recent fairly heavy purchases have put consumers in a way where they have requirements supplied for a time, and therefore, are not obliged to continue buying in the same ratio, that has lately marked their operations. Another reason is that a good many consuming industries have experienced a slowing down of activity in their own products, thus reducing the need for paper. Nevertheless there is, in the aggregate, a comparatively good business current in paper of all kinds. Demand in many cases may lack the snap that characterized it up to a few days ago, yet buyers on the whole continue to operate in sufficient number and in large enough volume to give the paper market a fairly lively appearance.

There seems no question that manufacturers and merchants in all parts of the States and producing and handling all manner of articles are endeavoring to reduce stocks of both finished and raw materials to as low a point as they can for the approaching inventory-taking at the end of the year. The probabilities are that most concerns will show in their annual reports that the year 1921 was far from a favorable year, and that with a view of making reports as attractive as possible, stocks will be worked down to a minimum between now and the time to compile inventories. This will undoubtedly result in a slowing up process in many lines of business; in fact, many attribute the quieter demand for paper during the past few days largely to this factor. On the other hand, opinion is common that as soon as the old year passes out and inventories have been figured that demand for various commodities will materially increase almost at once, especially since stocks of raw and finished goods will have been brought down low, thus making for a period of brisk business activity. Everyone in the paper trade is decidedly confident about the outlook, and many predictions are openly made that January will witness a sharp revival in the industry, from the gatherer of raw material of which paper is manufactured to the jobber who distributes the products of the mills.

The newsprint trade continues to be one of the high spots in the industry at present. There is a consistently good demand for print paper, and proof is not wanting that most of the supply moving from mills to publishers is going direct into consumption. The consumption of newsprint is steadily mounting. As the Christmas holidays draw nearer, department store and other retail advertising in the daily newspapers is increasing rapidly, and publishers consequently are using more stock to print on. Prices are steady to firm, with spot lots of standard newsprint in rolls selling at around 4.25 cents, with now and then a sale reported at higher than this figure.

A report issued this week states that the International Paper Company is steadily increasing its production of newsprint and that it is now turning out 800 tons of paper daily—two-thirds of the company's normal output . Plans call for more mills going into operation this month, and present indications are that by the end of the year capacity operations will be attained. Relief that newsprint prices, now $80 a ton on contract, will go lower next year, is not warranted, say I.P. officials. Even with wages reduced this year on an average of 17 per cent, the I.P. is said to be paying double the scale in effect in 1915, while coal, fuel, oil, and other supplies entering into the manufacture of paper are up on an average of 50 per cent. Moreover, it is pointed out, newsprint mills are now making paper of wood bought a year or two ago at high prices. With many of the large paper companies out of the market, pulpwood has slumped for a time, but it is held that it is bound to go up next year, in view of the curtailment of cutting. It is maintained that no great supplies of wood which would permit lower paper prices are available at the present price of around $17 a cord.

Newsprint consumption in the United States is estimated now to be on a par with that a year ago. For the year, consumption based on figures for the nine months to September 30 last will show a decline of only four per cent from that of 1920, a record eualed by few industries in this country.

There has been a softening of prices on plain box boards. Some mills are reported to have sufficient orders on file to absorb their entire production during the remainder of November, but others are looking for business, which, coupled with a slowing up of demand from box manufacturers, has made for an easier price tone. Plain chip board is selling in New York at $35 a ton f.o.b. this city, which means mills situated adjacent to this city are not realizing much more than $31 to $32 per ton on chip board. News board is quoted at $37.50 f.o.b. new York. On the other hand, folding box boards and boards for corrugating are in good demand and firm in price, with quotations of mills showing an advancing tendency.

GROUND WOOD:—Higher prices have been paid for ground wood this week. Sales of imported spruce ground wood on the spot in New York have been made at $34 a ton, ex the dock, and importers are reported holding for at least this figure on additional lots of spot pulp. Quotations from primary sources in Europe on ground wood for shipment range around $37 to $38, indicating that prices on the other side of the Atlantic have sharply risen, thus making sellers here strong in their attitude regarding prices. Domestic ground wood continues to sell at an average of between $30 and $32 per ton f.o.b. grinding plants, with a fairly steady business noted. Reports generally aver that there are few large lots of ground wood held in stock, and the technical position of the market is unmistakably firm.

CHEMICAL PULP:—Chemical wood pulp holds steady in price and there is a moderate business current. Paper manufacturers are buying cautiously, mostly limiting orders to supplies directly required, but producers and importers are obtaining enough business to make them firm respecting quotations. Bleached sulphite shows an advancing trend, and is likely to rise steadily until December 1, when the new contract basis of 5.25 cents becomes effective. Around 4.25 to 4.50 cents at pulp mills is the range of prices on No. 1 bleached at present. Easy bleaching also is on the rise, with sellers as a rule asking 3.50 cents or higher. Kraft pulp is meeting a good demand and is holding well in price at 2.75 to 3 cents a pound at pulp mills on No. 1 domestic kraft, and between 2.65 and 2.90 cents on Scandinavian kraft, with some sales of extra fine quality foreign kraft reported up to 3 cents.

RAGS:—Papermaking rags are in less demand than in sometime, and prices are moving lower on many

grades. Roofing stock is especially easy, and sales of No. 2 satinets to felt paper mills have been reported this week at 95 cents per hundred pounds, f.o.b. New York, whereas these same rags only a few days ago freely brought 1.25 cents. Foreign dark cottons for roofing mill purposes have sold at 1.10 cents, ex the dock New York. Old white rags are available at slight reductions in price, and dealers are beginning to ease up in their demands for high prices on new cuttings. No. 1 white shirt cuttings are reported offered to mills at 10.50 cents a pound New York and less, and buyers are succeeding in obtaining concessions on most other kinds of new rags. Old thirds and blues are quoted in New York at from 1.75 to 2 cents a pound on repacked stock, and at around 1.40 cents on miscellaneous packing.

PAPER STOCK:—Prices on paper stock have changed so often and in such measure this week that the best way to outline the situation is by giving a list of grades with ruling quotations. Dealers in New York are at present offering supplies to paper and board mills at approximately these figures: No. 1 hard white shavings, 3.50 cents per pound, f.o.b. this city; No. 1 soft white shavings, 2.90 to 3 cents; old No. 1 kraft paper, 1.90 cents; white news cuttings, 1.70 cents; old flat books and magazines, 1.25 cents; folded newspapers, 60 cents a hundred pounds; No. 1 mixed papers, 40 cents; ledgers and writings, 1.70 cents, and No. 1 old manilas, 95 cents. All of these prices denote declines. Flat stock especially has been weak, and mills in the Middle West are reported bidding only around a cent per pound New York for heavy books and magazines. Newspapers and mixed papers also have dropped off considerably in value.

OLD ROPE AND BAGGING:—Old manila rope is at least one grade of paper-making material which is holding steady in price. Dealers report sales to mills at close to 5 cents a pound at shipping points, with some few cases cited where 5 cents has actually been received. Old bagging is in dull demand at easy prices.

DIAMOND STATE FIBRE COMPANY OF CANADA, LIMITED, CELEBRATE SECOND BIRTHDAY.

Two years ago on November 7, 1919, the Diamond State Fibre Company of Canada, Limited, started business in Canada at 455 West King Street, Toronto. The rapid growth of the business from its inception soon necessitated moving and more commodious quarters were located at 235 Carlaw Avenue.

Here, with thoroughly up-to-date manufacturing, office and shipping facilities they are in a position to execute and deliver all orders efficiently and promptly.

In the showrooms there is a wonderfully comprehensive collection of Diamond Fibre products which demonstrate to prospective buyers the many purposes for which Fibre can be used.

There is no doubt that fibre, both as raw material and in the shape of manufactured products is becoming more and more popular in the electrical, automotive, textile, railway and industrial manufacturing field and it is gratifying to find a young Canadian Company taking so prominent a part in supplying this ever-increasing demand.

About the only advantage in losing an arm is that you can't smash your thumb when driving a nail.

SUMMARY OF THE TRADE OF CANADA FOR SEPTEMBER, 1921.

The summary of the trade of Canada for September of this year shows that, as represented in dollars, imports for consumption were valued at $59,721,602, as against $115,121,588 in September, 1920, and $85,506,012 in September, 1919. The imports from the United Kingdom were cut by more than half as compared with the corresponding month last year ($9,135,316 as against $19,646,468), and those from the United States by nearly one-half ($41,402,646 as against $81,166,429). The exports of Canadian produce for the month were valued at $58,263,182, as against $94,389,685 in 1920. The exports to the United Kingdom show an increase as compared with the corresponding period last year: $27,426,967 as against $26,267,849; those to the United States show a great falling off, $21,757,855 as against $48,176,049 in September, 1920. Imports for the twelve months ending September, 1921, were valued at $905,878,556, as against $1,325,779,894 in the twelve months ending September, 1920, and exports at $976,060,660 as against $1,208,919,175. The month's returns show an unfavorable balance of trade of $1,458,420, but for the twelve months ending September the balance of trade is favorable by $70,182,604.—Weekly Bulletin.

THE USE OF WATERPROOF FIBRE IN CONNECTION WITH PUMP VALVES.

In Oil Refineries, Oil Well Plants, Pulp and Paper Mills and other large industrial concerns, where Pump Valves are extensively used, the old style Pump Valve Discs are gradually being discarded in favor of those manufactured from Condensite Celoron. Being a vulcanized fabric material, water and oil proof, of a dense mechanical structure, tough, fibrous and non-absorbing, it is far superior to any other material for this particular purpose. The discs are generally about four inches in diameter, with lathe turned edge, ½-inch or ⅝-inch thick, with a drilled hole 25-32-inches or thereabouts. This is just one more instance where Diamond Fibre is ousting precedent and taking its logical place in the manufacturing field.

FOOLS AND FOREST FIRES.

Tommy and Tony were two pretty pets;
They went to the woods and they smoked cigarettes.
They tossed matches here, and they tossed the stubs there,
Till suddenly wicked flames filled all the air.
These flames burned the forest; they burned up the crops;
They burned up the homes and the factories and shops.
They burned up the church, both the nave and the steeple;
They burned up the village, and alas! many people.
Now when you go into the forest shades, cool,
Don't, as Tommy or Tony, act like a fool.
Don't be careless with fire, don't toss cigarettes,
Then the forest won't burn and you'll have no regrets.
As for Tommy and Tony, they'd escaped once before,
And carelessly thought they could do it some more;
But found, to their sorrow, public feeling had risen,
So, now they are spending six months in a prison.

JAMES LAWLER.



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SAVE OUR FORESTS.

If you feel that we have interested you in paper-making, now one of our great national industries, will you do something for Canada when you get back home? Remember that perhaps the greatest asset this country possesses in its international trade is having its life seriously jeopardized by something which foresight and better organization will prevent. We refer to the disastrous effects on our national timber wealth of forest fire and timber bug. Every year these two national dangers destroy sufficient good timber to keep ten mills such as the one you have seen to-day in operation for a full year. The awakening of public interest in this grave danger is a vital necessity and we ask you to use your influence in whatever way you can to have the present condition of affairs remedied. Each province is responsible for the preservation of its own timber wealth.—From the program of the visit of the Ontario Educational Association at Iroquois Falls, August 20.

AN IDEAL SCHOOL LUNCH.

Too much emphasis has also been placed upon the fact that the child's school lunch should be hot.

There is no necessity, from a physiological or nutritive point of view, to take into the stomach any food that is warmen than the stomach itself.

The principal points are that the food should be nutritious and simple, and that it should be eaten slowly and well masticated.

The ideal school lunch is a sandwich made of graham bread spread with good pure fresh butter, and eaten with a cup of milk. Nothing better in the way of a luncheon can be supplied.

If instead of butter a little cold roast beef, lamb, or mutton is substituted, the child has all the meat he needs during the day.

If I were left to prescribe a school luncheon, it would be a whole wheat sandwich buttered, a cup of milk, and an apple. I would not bother about the temperature, except that the milk should not be ice cold.—Dr. H. W. Wiley in "The League for Longer Life."

PAPER SHIPMENTS INCREASE.

Shipments of newsprint for the United States and Canada exceeded production by 8,521 tons. Shipments were 16 per cent. more than in September, and production 9 per cent more. Surplus stocks are equal to about four days' maximum production.

Wisdom is ofttimes nearer when we stoop than when we soar.

PURE GRIT.

In the Street of Life, walking in the darkness of the shadow, hungry old Satan was out hunting with his dogs, the little imps of human weakness.

A man came walking through Life's street.

Satan said to the little devil with a bitter face, "Go get him for me."

Quickly the imp crossed the street; silently and lightly hopped to the man's shoulder. Close in his ear he whispered:

"You are discouraged."

"No," said the man, "I am not discouraged."

"You are discouraged."

The man replied this time, "I do not think I am."

Louder and more decidedly the little imp said again: "I tell you, you are discouraged."

The man dropped his head and replied, "Well, I suppose I am."

The imp hopped back to Satan, and said proudly, "I got him; he is discouraged."

Another man passed. Again old Satan said: "Get him for me."

The proud little demon of discouragement repeated his tactics.

The first time that he said, "You are discouraged," the man replied emphatically, "No!"

The second time, the man replied, "I tell you I am not discouraged."

The third time he said: "I am not discouraged. You lie!"

The man walked down the street, his head up, going toward the light.

The imp of discouragement returned to his master, crestfallen.

"I couldn't get him. Three times I told him he was discouraged. The third time he called me a liar, and that discouraged me."—From Editorial in former Chicago Examiner.

It sometimes takes courage to insist that you are right, but a lot more to admit that you are wrong.

Our influence depends, not so much upon what we **know**, or even upon what we **do**, as upon what we **are**.

CHEMIST wanted to take charge of control work for Sulphite Mill. Must be well educated and have good experience. Apply stating salary wanted, education and experience. Apply Box 452 Pulp & Paper Magagine, Gardenvale, Que.

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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Q., December 1, 1921. No. 48

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

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Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

Subscription to any address in Canada, United States and British Empire, $5.00 yearly. Other Countries Postage Extra. Single copies, 15 cents.

Changes of advertisements should be in the Publishers' hands ten days before the date of issue

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EDITORIAL

POLLING NEXT TUESDAY.

By the Associate Editor.

Next Tuesday, the electorate of Canada at the polls will choose Canada's new House of Commons. The electoral campaign has been a protracted one. And whether this, in itself, is to be regarded as a good or an ill, it has, at all events, allowed ample time for the public discussion of all matters, whether mainly relevant, or mainly irrelevant, which can, in any sense, be regarded as issues in the contest.

Two circumstances have combined to render the campaign, which is now so near its end, one of exceptional interest and complexity, in the matter of its conduct, and of exceptional uncertainty in its outcome from the standpoint of the political prophets.

For one thing, for the first time in the history of Canada, the women of the whole Dominion will be entitled, next Tuesday, to exercise the franchise. There has been no tendency in the direction of the organization of any "Women's Party" as a distinct and separate political element among the electorate. And (in our view, at any rate) any such tendency would have been, on almost every ground, a matter for apprehension rather than for gratification. But yet the enfranchisement of a new, and a very numerous, class, such as the women of Canada constitute, and a class, moreover, which, in many respects, unquestionably possesses a certain solidarity of interest, means, and must necessarily mean, a novel contribution to the political institutions of the country. We believe that it will mean a contribution which will prove a source of substantial strength to the service of the State. Henceforward, the direct influence of the woman of Canada or our public and political life will be huge, and, in the main, we are sure that it will be wholesome.

For another thing — and also for the first time in the history of Canada — three parties, each with a platform, an organization, and an accredited leader of its own, are contestants for place and power. It is this fact which tempts the political prophet to despair. The Liberals expect to draw their main strength from Quebec and the Maritime Provinces. With equal certainty, and with no less reason, the Progressives look to make almost a clean sweep in Manitoba, Saskatchewan and Alberta. The Government expects to make nearly a clean-up in British Columbia, but pins its hopes mainly to Ontario. It is in the last-named Province—the Province which sends to the Dominion House of Commons pretty well three-sevenths of its total membership— that the forthcoming election will be decided.

We are not anxious to enter the ranks of the political prophets. But the concensus of opinion, among those who should be best qualified for that honorable company, seems to be that no one party is likely to secure a clear majority over the other two parties, but that, in the unlikely event of that happening — and, after all, in politics it is always only uncertainty that is certain— the Liberal party must be considered the only one which could, even conceivably, do so. Supposing that no one party could secure a bare majority over the other two, then it seems probable that either a coalition, or a more or less formal alliance between two parties, or between one party and a section of another party, would result.

There are those who predict that either a coalition, or an alliance, between the Liberals and the Progressives will be the inevitable result of the election. On the whole, that is what appears most likely to come about. A coalition would mean that the two parties would share the "sweets" — and the responsibilities — of office. An alliance, on the other hand, would mean that only one of the two would take office, but that it would depend for its continuance therein on the support of the other in Parliament, and would, as a consequence, have to shape its political course in the light of such conditions.

On the other hand, those are to be found who aver that Mr. Meighen and his colleagues will remain in office after the election (however it may result) and will form either a coalition, or an alliance, requisite to ensure them a Parliamentary majority with that section of the Liberal party which approximates the more nearly to their tariff views. In this connection, it should be pointed out that, however, badly the election may go against him, Mr. Meighen, after it as before it, will still be Premier of Canada, and he cannot be constitutionally compelled to tender his resignation of that office to the Governor General, until he and his Government are displaced by an adverse vote in Parliament itself. If, in a hopeless minority, after the appeal to the country, and if no prospect of a coalition or working Parliamentary alliance offers, he would, however, most likely resign without waiting for such an adverse vote in Parliament. But the fact that he will still be in office after the election undoubtedly gives him, on the morrow of the election a certain tactical advantage which may, or may not, be turned to practical account.

So far as the tariff, which is the principal issue in the election to be held next Tuesday is concerned, we take it that, speaking generally, the view of those concerned in the pulp and paper industry is that the present tariff, so far as it affects products of the kind that they themselves manufacture, is not far wrong. They do not want to see the barriers lowered. And not unnaturally. The

Canadian pulp and paper industry, located in a country so vast in extent, and, comparatively speaking, so sparsely populated, is at a disadvantage in competition with that industry in the United States, with its huge domestic market which, by its immense volume of trade, and its greater variety of conditions, renders the process of production less expensive than it is here. The tariff which the Canadian pulp and paper industry needs is a tariff of such a nature as, in effect, to rectify this condition, and to enable Canadian mills to secure all the Canadian business they are prepared to handle. That is just about what the present tariff does, and hence, the average pulp and paper manufacturer is extremely disinclined to see it made the subject of downward revision.

Assuming, for a moment, that reciprocity, in the matter of the products of pulp and paper mills, were to come into force tomorrow, what would be the effect? It would result, in the judgment of men who may be regarded as leaders in the industry, to whom we have put this question, in making the pulp and paper industry in this country but an adjunct to that industry in the United States. "What we need to do in Canada," said one of them, "is to speed up production, and the present tariff has aided that. The utmost competition within Canada is good for the industry. Each branch of it must be loyal to the other branches. As far as United States' manufacturers are concerned, if they want a share in our market, let them come and erect plants here, and share in it — as many of them have done — and they will be welcome. But we don't want the handicapping competition which is what reciprocity would mean in our present situation. In ten years' time, things may be different — we shall have a large and well-distributed population. But, for the present, the pulp and paper industry needs that measure of protection which the present tariff gives it."

Another phase of the probable effect of reciprocity in pulp and paper would be that Canadians would be shipping their wood to the United States and buying it back again in the form of paper. They would thus be paying "through the nose"—paying for the extra freight as well as for the paper, made from Canadian material by American labor.

The present tariff, it seems to be the general view in the industry, is one based on actual trade necessities and actual trade conditions. "We want no monkeying with the tariff", said one paper manufacturer, of great experience and judgment, to us, the other day. That terse summing-up of the situation undoubtedly expressed the view of the majority of pulp and paper men on the burning question of the hour.

COBWEBS.

Political capital is being made of the practice, now said to be largely discontinued, of stamping Canadian-made shoes with American names. Incidentally, it is disclosed that Canadian shoes are often shipped in American made fibre containers. One user is reported as saying his object is to force down the price of the Canadian product. What would he say to the general purchase of goods from his own American competitors for the purpose of breaking the price of his article? If "Buy Canadian Goods" means anything, it means co-operating in doing so.

Was the U. S. Pulpwood Commission abandoned because President Harding considers the situation satisfactory or the idea hopeless?

The Editor enjoyed being present at the presentation by their friends and fellow-workers at the Garden City Press, of a chest of silver to Mr. Armstrong, superintendent of St. Anne de Bellevue plant of the Industrial and Educational Publishing Co., and Mrs. Armstrong on the occasion of their 25th wedding anniversary.

Solomon said, "He that walketh with wise men shall be wise." You can have the company of many of the best authorities in the industry, and have their knowledge at your elbow, by ordering the textbooks on the Manufacture of Pulp and Paper. Write for particulars.

Headline in Montreal paper: "Dead man had permit to carry revolver." That's the right idea; if only dead men are permitted to carry arms, there will be fewer murders.

SCENERY, IN SPOTS.—A REVERIE.

H. TUESS.

Birch and poplar,
Birch and poplar,
Growing like the deuce,
Why the dickens can't we see
Some little sprigs of spruce.

Stump and charling,
Stump and charling,
Scattered round profuse,
This is what became of them,
Those little sprigs of spruce.

PORTUGUESE APPRECIATION OF TREES.

In many places where timber trees are to be found in Portugal, one sees the following inscription:

"Ye who pass by and would raise your hand against me, harken ere you harm me."

"I am the heat of your hearth on the cold winter nights, the friendly shade screening you from the summer sun, and my fruits are refreshing draughts quenching your thirst as you journey on.

"I am the beam that holds your house, the board of your table, the bed on which you lie, and the timber that builds your boat.

"I am the handle of your hoe, the door of your homestead, the wood of your cradle, and the shell of your coffin.

"I am the bread of kindness and the flower of beauty.

"Ye who pass by, listen to my prayer; harm me not."

Lumber and the Banks

By W. P. RAPLEY, Sherbrooke.
(From "Caduceus," the staff magazine of the Canadian Bank of Commerce.)

In view of the close business connection between the banks and the pulp and paper industry, Mr. Rapley's article will be helpful in presenting the banker's point of view with regard to financing lumbering operations. For the most part, the article might have been written of pulp wood operations, with a rossing plant for a saw-mill.—Ed.

The embryo banker has a wonderful source of information at his disposal, which may or may not be appreciated; he has the opportunity to obtain a fundamental knowledge of the various industries conducted by customers of the branch at which he is stationed. If the desire exists, and it should be cultivated if it does not, he has only to take advantage of his environment to acquire an education which will never be regretted and which will be an important factor in preparing him for the responsibility of a managerial appointment. There is one industry producing a commodity second in importance only to wheat, the details of which are known to comparatively few of the branches —and that is lumbering. With the lure of the woods and rivers strong with us, there cannot be many who are not familiar with the romance of lumber from log to mill, but this article is written in the belief that there are unusual and interesting features in connection with its financing of which many of the staff are not aware.

Credit is granted for lumbering on a more generous scale than is the case with any other industry; the proportion between liquid assets and floating liabilities seems at certain seasons to violate every rule of safe banking, but the vital importance of the product guarantees a market, and the security from the standpoint of reasonable liquidation may be regarded as imperishable except from fire. In every lumbering centre the inhabitants will point out to the newly-arrived banker the residence of local millionaires who, having begun with nothing, have become wealthy through lumber or pulpwood. This at first gives him the impression that the forest offers the surest and easiest road to fortune. He soon learns, however, that many have ventured without success, and when he considers the attributes of energy, ability and courage that a lumberman must possess to begin with the proverbial "shoestring" and year after year place his entire capital at the mercy of the elements, he is forced to the conclusion that the reward is well deserved.

Securing the Account

In order to consider comprehensively some of the salient features peculiar to the industry, let us assume that, as bank manager, it is our duty and privilege to watch the account of a lumberman, who after operating successfully for a certain number of years has acquired a handsome surplus of say $150,000, but has cut over his limits and is compelled to seek a fresh field. He disposes of his cut-over lands, mill, stock, etc., and purchases a substantial limit, intending to operate on a more extensive scale. To secure a property of any magnitude probably means moving to the outskirts of civilization, as each year results in the exhaustion of the forests in the more settled districts. The account may previously have been carried with a bank not represented at the town where we are stationed, and upon learning of the sale of the limits in question and after instituting enquiries and assuring ourselves of the purchaser's standing, we formulate our plans to secure the connection.

If our efforts meet with success the account is opened in the spring. We are informed that a mill will be erected and roads built with a view to commencing operations in the fall. No advances will be required until cutting commences, but we arrange for a statement to be submitted on 31st August in order that a line of credit may be established in plenty of time.

His First Statement

On the date mentioned our new customer calls at the office and presents us with the following figures:

Statement as at 31st August.

Cash in Bank	$17,000
Accounts Receivable	18,000
	$35,000
Limits	80,000
Roads, camps, etc.	3,000
Interest in Booming Co.	3,000
Horses, sleighs, etc.	7,000
Camp and mill supplies	3,500
Mill and machinery	40,000
Railway sidings	1,500
Residence	5,000
	$178,000
Accounts payable	$3,000
	$3,000
Due on limits, payable $5,000 per annum, first payment due July of following year.	25,000
Surplus	150,000
	$178,000

He states that he wishes to get out about 5,000,000 feet of logs and requests a credit of $100,000 to be secured in the usual manner by assignments under Section 88 of the Bank Act.

We have now had sufficient time to become well acquainted with our customer, have seen the mill erected, and after studying the assets, arrived at the conclusion that we are prepared to recommend the account. However, our superintendent remains to be convinced, and we must consider the information to be embodied in our communication in order that the application may be viewed in a comprehensive manner. Let us ask ourselves the following questions.

The Banker's Knowledge

What do we know of our customer's ability, reputation, etc.?

We have found by means of mercantile and bankers' reports that he was well and favourably known at his former place of residence, and has had many years of experience as a lumberman. He had cut over his lands and was able to sell his mill and real estate and

was therefore possessed of sufficient ready money to develop his new property. His eldest son has assisted him for five years and has been trained in every branch of the business. This is an important feature as providing against mismanagement in case of the father's demise or long illness.

What do we know of the limits?

While we have not had them cruised, we know from reports that they are looked upon by lumbermen as equal to any in the district and were carefully inspected by our customer before the purchase was consummated. They are reported to contain an abundance of spruce, which can be lumbered at a minimum of expense. The property lies along the banks of an easily driven river, and is intersected by small streams and brooks, which ensures a short haul. While the limits are not freehold, the land is not suited to agriculture and no difficulty will be experienced in obtaining renewals of the licenses in due course. When the large timber is cut, the property should have value as a pulpwood investment.

Technical Information

What is the nature of the drive?

The limits are about twenty-five miles up stream from the mill, and there are only two other concerns driving the river. These three have joined in forming a booming company for the purpose of making what is known as a "corporation drive." That is, the company has constructed the necessary piers and booms and will handle the three drives which will come down simultaneously in the spring, and the logs will be sorted and boomed and the expense divided pro rata. The river empties into a small lake on which the mills are located, and there is absolutely no danger of loss if the booms should be carried away by a freshet.

What is the equipment of the mill?

The mill is complete and well constructed, considering the cost, and at a conservative estimate the limits provide for a life of fifteen years. Its capacity can be increased by a small outlay should additional limits be purchased or more extensive operations be carried on. The burner is not of steel construction, but is what is known as an "open burner." For this reason the insurance rate will be considerably higher, but the additional cost of a steel burner would have been prohibitive at this juncture. A high-pressure pump has been installed to provide protection against fire. Adequate insurance is carried on the mill and every care will be taken to avoid fire, as the loss of the mill in the sawing season would likely result in a "lock up" until a new mill could be erected. There will be no expense for fuel as the sawdust is available for this purpose.

What are the railway facilities?

The town is situated on a transcontinental railway, and our customer will not be at a disadvantage with competitors as regards freight rates. The yards are served by a siding, and loading can be carried on expeditiously.

What labor is available?

Plenty of local labor is available, and our customer has brought a number of his foremen with him. They have been in his employ for years, and their loyalty is an indication that there is little likelihood of his having labor troubles.

The Balance Sheet

The items composing the balance sheet are for the most part self-explanatory. We might mention that the accounts receivable appear to be first-class, and should all be paid during the next three or four months. We shall not show them in our declarations, as they represent the former business, and do not in reality pertain to our security by way of Section 88. We should, however, be justified in doing so, as we have obtained a general assignment of accounts. The timber licenses have been registered in our customer's name, and he has assigned them to the vendors to secure the unpaid portion of the purchase price. The agreement permits him to complete the transaction at any time, but he cannot be called upon to pay more than $5,000 per annum, provided the cut does not exceed 6,000,000 feet.

While there is apparently a lack of liquid assets for a credit of $100,000, we must remember that with that amount he should eventually convert 5,000,000 feet of logs into at least 5,750,000 feet of lumber, allowing for a modest overrun of 150 feet per thousand. Estimating that this lumber should realize say $34 per thousand, or $195,500, we feel satisfied that after allowing for all reasonable shrinkages, the bank will be provided with ample security. However, it is likely to be over a year from the time the cutting commences until the sawing is completed, and in the meantime operations will have commenced for the next season. As a result we shall never be able to show a liquid surplus to confirm the figures we have used, and as the reason may not be clear to any one not familiar with the industry, we shall endeavor to explain as we go on why a lumber account generally appears to be receiving unusually generous treatment from its banker.

Granting The Credit

After complying with the usual formalities, the credit is granted, embodying the stipulation "relative insurance in favor of the bank." This clause is of great importance, and we must be alert to see that it is observed. There can be no loss by fire until the logs are hauled from the water and sawn into lumber, but we must see that sufficient insurance is placed and lodged with us at frequent intervals as the manufactured stock accumulates. Many lumbermen cancel the insurance on their manufactured stock as soon as snow falls and do not replace it until spring, as there is not considered to be any risk during the winter. This is a matter which must be carefully considered according to the circumstances and conditions surrounding the account.

Our customer will be anxious to commence cutting as early as possible, as with deep snow he will not be able to cut as close to the ground, and valuable timber will be left on the stump, but the date will depend upon the labor situation. If he employs farmers from the surrounding country, they will not be able to leave their farms until the harvest is gathered. Under present conditions large operators in the Province of Quebec prefer to have the cutting done by contractors or jobbers as they are called, who undertake the work at so much per thousand feet to be paid at intervals as the work progresses. These jobbers will fell the trees and yard the logs but the hauling to the banks of the rivers in most cases will be undertaken by the operator. There are several reasons for employing jobbers who are generally farmers well known as to their ability and integrity, but the chief advantage is the fact that there is less likelihood of labor trouble. A jobber may have a small contract necessitating the assistance of three or four men, or it may be larger. He will naturally engage his own relatives or friends,

and it has been found that he obtains much better results than when gangs of men are supervised by foremen. Which course is pursued depends to a great extent upon the location of the limits and their distance from civilization. If there are no settlements close by it will be difficult to secure a sufficient number of capable jobbers.

Customer's Declaration

To return to the hypothetical account in question, we must obtain declarations in connection with our security, and our customer should be asked to compile these figures once a month. We will say that on 31st December we receive a declaration as follows:—

Advance to jobbers, $20,000.
Bank loan, $5,000.

Not much information, and one not familiar with conditions would naturally ask for more particulars. However, it would be impossible to record exactly how many feet of logs the jobbers have cut and the security shown represents the amount paid out to them together with other expenses incidental to the work. So far the bulk of the money required has been furnished by the customer.

On 31st January the estimate stands at:—
Advances to jobbers, $35,000.
Bank Loan, $20,000.

Cutting is now in full swing and the logs are being hauled to the rivers.

Declaration 28th February:—
Advance to jobbers, $55,000.
Bank Loan, $40,000.

Our customer is still using moneys received from accounts receivable, but this is not apparent, as there are certain overhead expenses which are not yet reflected in our security.

Second Declaration

By 31st March, when the next declaration is received, the hauling has been completed and the logs are on the banks or in the streams ready for the drive. The jobbers have been paid in full, and the scale shows the total cut, and the declaration received for the first time shows something tangible:—

5,075,000 feet logs at $15, $76,125.
Bank Loan, $60,000.

The winter has been favourable, and no logs have been left in the woods; the scale is gratifying inasmuch as it shows that our customer has to all intents and purposes kept within his estimate which confirms our confidence and furthermore indicates that his credit should prove ample.

With a normal spring providing plenty of water, no difficulty should be experienced in the drive, and we will say that on 30th April the logs are boomed and the mill put in operation. The declaration reads:—

Logs in streams, 275,000 feet at $15	$ 4,125
Logs in booms, 4,800,000 feet at $18	86,400
	$90,525
Bank Loan	$75,000

It is evident that 275,000 feet of logs were "hung up" in the drive. These logs should come down next spring, and as they bear our customer's special mark they constitute good security. There will, of course, be some shrinkage, but we shall not take it into consideration, as we know the figures and valuations to be sufficiently conservative to allow for this contingency.

Third Declaration

We will assume that on 31st May, after the mill has been running a month, the following declaration is received:—

Logs in stream, 275,000 at $15	$ 4,125
Logs in booms, 4,175,000 at $18	75,150
Lumber, 800,000 feet at $30‡	24,000
Overrun of 15 p.c. allowed for	
	$103,275
Bank Loan	$ 80,000
Fire Insurance	16,000

Our margin of security should continue to improve steadily from now on. In the early stages we may have experienced some misgiving that there might be a hitch, but our security is now in a condition where we can verify it from a personal inspection.

The mill functions properly and the sawing is carried on, and during the summer we visit the mill frequently. Our observations show that the book-keeping provides for a complete record of each day's sawing, loss of time through accidents, etc. The lumber is carefully sorted and piled and the stipulation of the insurance companies strictly carried out.

Year's Operations

On 31st August our customer advises that his entire output has been contracted for by responsible firms at an average of $34 per thousand run of the mill. His statement is now a year old, but he advises that he would prefer not to tender an audited statement until 31st December, when the yards should be clear of lumber and the results of the year can be comprehensively reviewed.

He submits a declaration and estimate of profit, and requests that a fresh credit should be granted to finance a similar cut for the coming season. The proceeds of sales will meanwhile take care of operations and permit him to keep within the present and anticipated credit. The profit is estimated at $25,000, and we might reasonably ask why the application could not be reduced to this extent, but it is important to remember that we have assumed for convenience that no logs or lumber were held over and that the circumstances were propitious throughout. If our customer had not been starting a new venture, it is doubtful if he could have got out 5,000,000 feet with loans of $100,000, as he would likely carry over a portion of his stock to meet with some slight reverse, and he will do well to keep within this figure next year, allowing for the $25,000 additional capital provided from profits.

Declaration 31st August:—

Logs in streams, 275,000 feet at $15	$ 4,125
Logs in booms, 1,500,000 feet at $18	27,000
Lumber, 22,800,000 feet at $30	84,000
Accounts receivable for lumber sold at $34..	33,400
	$148,525
Bank Loan	$100,000
Insurance	80,000

It would appear that on 31st December with the entire stock sold at $34, the account should show a much larger margin of liquid assets, but we must remember

‡The valuation of $30 per thousand is somewhat in excess of actual cost, but considerably below probable selling price. This portion of the security is now in a merchantable form, and the declaration which is compiled in accordance with the usual practice meets with our approval.

that there will be advances to jobbers, with the result that the ratio may not reach more than 1.50 to 1. This we regard as highly satisfactory for an account of this nature, and to confirm our views we would mention that the Federal Reserve Banks in the United States, while demanding assets of 2 to 1 when offered paper for re-discount, make an exception in favor of the lumberman and are satisfied with a margin of 1.50 to 1.

Space will not permit us to go into details regarding the estimated net profit of $25,000. Suffice it to say that we believe it to be conservative. According to the original estimate which has proved approximately correct, there should be a profit of say $45,000 which would leave $20,000 to take care of depreciations, interest, taxes, etc.

Some Things to Watch

Now while our experience has been most satisfactory, our observations of the past year have given us a pretty good idea as to what pitfalls exist and what contingencies may arise, and we will record them herewith.

1. Owing to the distance to the limits, it is impossible actually to check the operations and the moral security must be first-class.

2. The success or failure depends on the customer's ability, and once the bank has made advances it must carry the operation through as the security cannot be realized until manufactured into lumber. For instance, if a credit were granted to cut 5,000,000 feet and the customer, either through poor judgment or by taking advantage of his position, cut 7,000,000 feet, the bank would in self protection be obliged to increase the loans in order to make the security marketable.

3. It is impossible to avoid seasons overlapping. That is, the loan will not be liquidated before it will be necessary to make advances for the next season. For this reason it would be advisable to review the account at the end of the summer with a view to ascertaining the customer's plans. If contracts have not been made for the manufactured lumber and the demand should fall off, the bank might unwillingly find itself committed to finance another cut, which would necessitate much higher advances than it would have cared to entertain.

4. No matter how able the operator may be, he is at the mercy of the elements. There may be too much or too little snow. The spring may be open before his hauling is completed, or there may not be sufficient water to float his logs to the main river, and the mill may be so located that there is danger of a sudden freshet carrying away the booms with a total or partial loss.

5. The life of the mill depends upon the life of the limit. Its valuation should be written down, or a reserve set aside each year, if fresh limits are purchased.

There is a great deal to learn in connection with lumbering. Those who are fond of outdoor life can combine business with pleasure, shoot over the limits in the fall and fish the streams in the spring, and thereby familiarize themselves with the property and the various stages of operation.

Note:—The figures used in thhe foregoing are, of course, not based on actual facts, and could not be used for the purpose of comparison. It would be difficult to arrive at an estimate that could be regarded as correctly proportioned, as costs and selling prices vary according to the physical aspects of the property and its distance from the market, either for domestic use or export. In order, however, to give some idea of the probable cost of lumber, we have compiled the following:—

Estimated Cost of Lumber Per Thousand Feet

Cost of lumber in the log		$12.00
Cost of stumpage and Government fee	$5.50	
Cutting and yarding	6.50	
Hauling and driving		$ 6.00
Hauling	$3.00	
Driving	3.00	
Cost of sawing		4.00
Cost of piling, handling, etc.		1.50
Overhead and incidental expenses		2.50
		$26.00

FARMERS WILL NOT CUT WOOD FOR NOTHING.

If present information is reliable, very little pulpwood will be cut this season in the Province of Quebec either by the pulp and paper companies or by the farmers. Neither will there be any great quantity of rail wood moved. The reason for this condition is not far to seek. Canadian and American mills have, with few exceptions, very heavy stocks on hand—so heavy that the requirements for the next year are more than filled. This is not counting all the enormous stocks which have been bought, at high prices, and which the companies are not anxious to move, particularly at the high freight rates—not now so high for distances up to 128 miles, but sufficiently high to discourage movement just now.

The Canadian Pulp and Paper Association made very urgent representations to the railway companies with a view of securing reductions on pulpwood. Something has been accomplished, but not a great deal. In July rates in Eastern Canada for distances over 125 miles were reduced, and the new order of the Railway Commissioners reduces the rate for shorter distances one half cent per 100 pounds, about 20 cents per cord.

As has happened before, the present low price will probably result in reducing supplies of pulpwood, with a consequent large diminution in the available wood next fall. We may then witness a substantial recovery in values.

CANADIAN SECRETARY OF T.A.P.P.I

Mr. W. G. MacNaughton has been appointed Secretary-Treasurer of the Technical Association of the (U.S.) Pulp and Paper Industry, as successor to Mr. T. J. Keenan, who resigned recently to resume the editorship of "Paper."

Mr. MacNaughton was born in Canada (he didn't say when) and graduated from McGill in Chemistry in 1904. He was with the Canada Rubber Co. two years and then, until 1917, was Chemical Engineer and Manager of Manufacturing with the Nekoosa-Edwards Paper Co., at Fort Edwards, Wis. In 1917, Mr. MacNaughton went to Spokane, Wash., as General Manager of the Inland Empire Paper Co., and from 1919-1921 superintended the construction work done by the Spruce Falls Pulp and Paper Co., at Kapuskasing, Ont.

The new Secretary's practical experience will be a big asset to the T.A.P.P.I.

Need of Contact Between Cost and Technical Men*

By FRED C. CLARK, Vice-President Technical Association of the Pulp and Paper Industry.

In these days of close analysis in connection with industrial operations there is developing a greater demand for means by which the daily operation of a plant or process may be measured to show either one or both of two things. The plant manager is continually asking for both reduction in cost and improvements in quality. In the final analysis the success or failure of a plant from an operating standpoint is entirely a question of continually reducing costs and improving quality, and strange as it may seem any plant that works out a method that enables it to operate more economically, resulting in lower costs, almost invariably discovers that by doing so it is possible to increase quality. This is so because the close study that is required in reducing costs brings to light additional knowledge and increase in quality.

To carry out these two fundamental ideas in plant operation, namely, lowering cost and increasing quality, there must be a correct method by which these results may be secured and this method may only be brought about by a thorough understanding of the function of the cost man and the technical man in their relationship to each other. In this discussion it is well to forget for the moment the effort that must be expended by the sales department and the final result as shown by the company balance sheet. The question of a satisfactory balance sheet may only result through proper co-ordination of all factors with the company.

The Point to be Emphasized.

The point that it is desired to emphasize is the relationship that must exist between the cost man and the technical man. Briefly, the first function of a cost man is to develop means by which the technical man may secure a graphical picture of the various elements entering into the operation of a plant. Without the yard stick built up by the cost man, it will be impossible for the technical man to make any real fundamental advance. The chief duties of the technical man are the development of new and improved processes and the study of the mechanics involved in plant operations.

Let us assume for the moment that both a new cost man and a new technical man are just entering the employment of a company which has paid little attention to either cost or technical work. The first thing for the cost man to do is to make a survey of the plant from the standpoint of devising means by which the various elements in the plant operations may be costed. If past records are available he will go back over these, at the same time building up a tentative cost system. The result of his observation enables him to show that certain operations have been done in the past for a certain amount per unit of productive or per operating hour. These figures then become a tentative yard stick in measuring future results.

First Thing for the Technical Man to Do.

When the technical man starts out he will first make a survey of the plant operations in order to determine the mechanical relationship between all individual parts. With this data carefully developed he will then go to the cost man for the purpose of applying the yard stick set up by the cost man. With this preliminary work completed it then becomes the duty of the cost man to determine whether the mechanical relationship of the various elements in the process are running above or below the tentative standards set up. The analytical cost man as a result of his study of plant operation will be able to point out continually to the technical man where the plant is falling down in efficiency. The cost man, therefore, becomes the plant barometer and enables the technical man to predict the results that will be accomplished by any modification in the process.

It is quite common practice for a plant manager or a technical man to consider that increase in production is the only point to be considered. An increase in production, however, is not justified if this increase in the rate of machine hour operation or the rate per unit of production. Therefore, it is necessary for the cost man to supply this information.

When the technical man tries out a new plan his only method of determining whether this plan is good or bad is as a result of the report by the Cost Department. In every case it is proven out that a suitably worked out cost system will enable the cost man to even foretell a drop in the efficiency of the plant operation. Many illustrations can be given to show that this advanced information can be used to check the decrease in plant efficiency and result in large savings to the company. The cost system may, therefore, become a continually operated automatic alarm system, to point out any decrease in plant efficiency.

One or two illustrations may be given to show the operation of such an alarm system.

Several Illustrations.

A mill that had been using a normal amount of bleaching powder very suddenly showed a tremendous increase in daily consumption. The cost department requested the technical department immediately to look into the case. An analysis of the bleach powder showed that it was well up to requirements in strength. A survey of plant operation, however, showed that there was a tiny crack in the hydrometer, used in measuring the bleach liquor, which resulted in giving fictitious readings. Had the cost department not been in a position to analyze the operation of this plant and had they not called this matter to the attention of the technical department it would have been easily possible for this mill to have lost $2,000 worth of bleach per month. Many similar cases in the handling of process supplies could be given as illustrations. Some of them showed that the plant because of poor measuring methods was reporting much less than their actual consumption and other cases have been noted in which the reported plant consumption was very much greater than the actual consumption. Results of this kind do not appear evident until they get into cost records and in this way become a barometer by which the efficiency of a plant may be determined.

New processes, new equipment and new methods all must be justified through the cost man, resulting either in reduced cost or a better product having a higher

*Address given at the Drake Hotel, Chicago, October 6, 1921, at the Sixth Semi-Annual Convention of the Cost Association of the Paper Industry.

market value. Because of these facts the work of the technical man must ever remain incomplete without the closest co-operation with the cost man. What is true in plant operations is equally true in regard to the report of an engineer, namely, that the report in its final analysis must be measured in dollars and cents, or, in other words, measured by the yard stick of the cost man.

Cost Man in Scientific Work.

It may be interesting to state that the cost man is essential even in scientific work. Several large industrial research laboratories have installed very complete cost systems. Each problem presented is given a number to correspond with the job number in a machine shop, and to this job number is charged part of the overhead as well as the actual cost of labor and materials. Such cost figures result in two things. In the first place it becomes possible to determine what type of investigational work is really productive and in the second place it acts as a governor to prevent the "hit or miss" undertaking of a problem without due consideration for the costs involved and the results to be accomplished. If the problem to be undertaken is really worth while then it will justify its cost, and if it cannot justify this cost such work should not be undertaken.

Cost and Technical Men Co-operating.

It is a matter of a great deal of gratification to see the Cost Association and the Technical Association beginning to ask information of each other. This shows an extremely healthy state for the industry. The more closely these two organizations can work together the greater will be the benefit to the industry. A number of very interesting problems have already been undertaken, two of which will be of tremendous value. The one in regard to beater furnish may easily result in a very radical change in the whole paper-making process, while the second problem relating to depreciation will have two far-reaching results. The first will be the setting up of recognized standards in regard to machine and equipment depreciation, and the second, which is probably more important, will be to point out the fact that certain types of equipment or equipment used in certain manufacturing processes have a very much higher rate of depreciation than necessary. Such definite information will result in improvements in equipment because it will bring to light conditions that are now unknown, or only known in a very hazy indefinite way.

There never was a day in the history of the paper industry in which there was greater need for co-operation between the cost and the technical man. American paper exports are merely a memory because of foreign competition.

Paper products are being landed in this country at 25 to 50 per cent under our cost of manufacture. This condition is a fact and must be faced. It is, therefore, imperative that the cost man and the technical man work in such close cooperation that every single advantage may be secured for American industry.

RIORDON SALES RE-ORGANIZED.

A reorganization of the Riordon Sales Co. has been effected and style under which this concern will be known in the future will be the Riordon Sales Corporation. Mr. T. J. Stevenson becoming new president, Mr. George Challes and Mr. Russell McCandless vice-presidents, Mr. H. J. Webb treasurer, and Mr. F. G. Robinson manager.

LOCKWOOD'S DIRECTORY FOR 1922.

Lockwood's Directory needs no introduction to the paper, stationery, and allied trades, which it covers. The 47th annual edition is now being distributed and can be had for $7 in American funds, from the Lockwood Trade Journal Company, 10 East 39th Street, New York City.

It is hardly necessary for us to comment on this work as it has become the standard directory for North America. We can only say that we find ourselves obliged to order a second copy as we have so many friends connected with the industry who are continually borrowing ours from us.

The contents are as follows:

Pulp and Paper Mills.

All the Paper, Wood Pulp and Chemical Fibre Mills in the United States, Canada, Mexico, and South America, geographically arranged, with the names of officers; a complete statement of mill equipment; kind of power used, product of mills, and total production per 24 hours.

Mills Classified According To Products.

All the mills making the same kinds of paper, boards or pulp are brought together under headings descriptive of their products.

Makers Of Paper Specialties.

Giving the names of concerns that convert paper to special purposes. Where to find "Paper Specialties" is answered in this list.

Paper Dealers.

Wholesale paper houses with indicating marks telling whether the business is done through stores or from warehouse or mill direct; large concerns selling paper as a side line are also included.

Pulp, Rag and Paper Stock Dealers.

Names of houses dealing in rags, old papers, sulphite, sulphate, etc., including importers.

Converters of Paper.

Included under this heading are those concerns that turn out the following products: Glazed papers, Coated papers and boards, Waxed and Parchment papers, Toilet papers, Saturators of Roofing stock, paper bags, paper boxes, envelopes, pads and tablets, tags, wall papers, etc.; also a list of Twine manufacturers.

Stationers' and Office Appliances.

Leading Stationers and others handling Stationery and Office Appliances in the United States, Canada, Mexico, Cuba, Porto Rico and the Phillipine Islands. The list printed is considered the most complete and most accurate published.

Watermarks and Brands.

All the leading titles used in the American Paper Trade are included.

Who's Who in the Paper Industry.

This list includes all the prominent mill officials, together with their connections.

Trade Associations; Statistical Information and the Advertisements;

the latter comprising the most complete guide to the sources of supply of machinery and Raw Materials used in the industry.

McMASTER WITH POWELL RIVER.

A. E. McMaster, former superintendent of the commercial department, Grand Trunk and Pacific Railway, in Vancouver, and secretary of the Whalen Pulp and Paper Mills, has been appointed to the post of resident manager of the Powell River Pulp and Paper Company, Powell River, B. C.

Canadian Forestry Needs

(From American Forestry.)
By ELLWOOD WILSON.

The progress being made toward practical and rational management of the Government forests in Canada is most gratifying. It is however only in its embryonic stage and much work needs to be done. Of course, the first and most important thing is fire protection and this is receiving more and more attention. Five years ago a summer like the past would have caused enormous destruction, but in spite of the weather and the numerous fires the loss of valuable timber was not large. Much has been done during the past season by airplanes, not only in locating and reporting fires but also in carrying men to put them out. Aerial work will certainly increase in importance and value very rapidly in this country owing to the great extent of forests and the very meagre means of communication.

The second great need is for an inventory of our forest resources. We must know where the northern limit of merchantable timber is and also the eastern. Offerings of timber properties in Labrador are from time to time coming on the market and there seems to be no reliable information as to whether there is any timber there or not. Some reports say that there is enormous wealth and others that there is timber only on the rivers and surrounding lakes and that the hills are quite bare. Many people when they hear of the rapid depletion of our forests turn over in bed with the comforting thought that we shall only have to go a little farther north to get all we need and want. We must know the areas which have been burnt over and whether they are being naturally reforested or not. The areas already cut over must be mapped and the probabilities of a new crop ascertained. It seems fairly certain that one-third of the original forests of Canada have been burnt, that is, are not now covered with merchantable timber, or with timber that will be merchantable in a generation. Here again the airplane is doing yeoman service and it is only by its help that we can get the above information, in time to influence our legislators to the necessity of making log time plans for the proper use of the forests.

Knowing approximately the amount of timber which we have and the annual consumption we can at once bring the whole forestry problem from the realm of opinion and conjecture down to the basis of fact and business necessity. Knowing how many acres of merchantable timber we have, how much is cut-over, how much is burnt, and about how much is likely to be burnt each year, and knowing the annual consumption we can say that we will not reach the end of our supply for a century. In which case the lumbermen and the general lumber using public can do the worrying. If however, it appears that our supply will be exhausted in fifty years or less than the pulp and paper manufacturers and the newspapers will begin to get excited and there will not only be fireworks but constructive action. Fortunately since the majority of timber lands in Canada belong to the Provinces each one of these has only to say, "Gentlemen, you are using our timber faster than it grows, we must reduce your allowance." There will be no question of "mandatory" legislation or invasion of property rights. In Canada, a very large amount of revenue in several of the Provinces comes directly from the sale of stumpage and a decrease in the amount of timber cut means a decrease in revenue and a consequent increase in taxation. The question is vital and comes home to every citizen. Therefore the question is, if we have only enough timber for fifty years what are we going to do about it, not fifty years from now, but at once? What is the proper, business-like and commonsense way to handle the problem? In Europe it has been abundantly proved that you must spend money on your forests if you want to increase your revenue, just as you do on a farm or in a manufacturing plant. You must get the largest possible amount of timber from each acre. Many people seem to think that because a pulp or paper company has large timber limits, several thousand square miles, that they are in a strong position and have plenty of raw material for the future. This does not follow. There may be large burnt areas, large areas of swamp and water, it is a case where timber per acre is the important point. It does not take a financial genius to understand that it is better to have one square mile of land carrying 20 cords of merchantable timber to the acre within fifty miles of the mill than to have seven square miles carrying three cords of merchantable timber one hundred and fifty to three hundred miles away. There seems to be an idea that it is better business to have large areas of poor timber several hundred miles away from a mill than to take care of future requirements by planting right at the back door of the mill. Our Governments are at present selling the right to cut timber with practically no regulations which will insure the future productivity of the forest and with absolutely no regulations which will improve its condition or keep it on a basis of sustained yield. The amounts spent on fire protection and inspection are ridiculously small. No planting on a really commercial scale is being done. We are living on our capital. However signs are not wanting of a public awakening, brought about in large part by the far-sighted self interest of the pulp and paper industry. Their position is that they have an obligation to their stockholders to keep the plants running, to the region, to see that towns and country districts which have been developed as a result of the establishment of their plants, do not go the way of the saw-mill towns of Pennsylvania and the Lake States, and to the Provinces which by the lease of water-powers and timber limits make their existence possible. After all true patriotism is good business.

NEW "SHANTY BOOK."

A new form of "Shanty-book" has just been issued for the Quebec Department of Lands and Forests. A "Shanty-book" is a book which is issued to jobbers working on Crown Lands, in which they are required to enter the number of logs cut each day. Each time the scaler measures the logs cut he must copy his record into the "Shanty-book" and this must be open at all times for inspection by the Forest-Ranger. The regulations governing the cutting of timber are printed in the front of the book and the penalties for infractions with them in red. Information as to the general value of the forests to the public are set out on the inside front cover, together with advice as to avoiding forest fires and the reasons for not wasting timber. Forms for affidavits of those using the book are included and on the back is printed a poem by Andre Theuriet called the "Benefits of the Forest."

Mr. Beck Seriously Misquoted

Mr. Edward Beck, secretary of the Canadian Pulp and Paper Association, and members of the Association, have been the victims of a chain of regrettable circumstances in relation to the publication of an article dealing with the price of newsprint. By a particularly unfortunate mischance Mr. Beck's name was attached to this article, which expressed opinions directly opposite to those held by him and by members of the Association. In view of the wide-spread publicity given to this article, and the erroneous quotation of Mr. Beck as the author, it is only fair that we should briefly give the facts.

About a month ago Mr. E. P. Adler, chairman of the Paper Committee of the A. N. P. A., gave an address in Chicago which was reproduced in the American trade papers. That address was clearly intended to break the price of paper, the arguments being all in favour of cheap paper. Three weeks after the address was printed, it was copied by the Montreal Financial Times, who gave Mr. Edward Beck as the author of the address, instead of Mr. Adler. When the attention of the Editor of that paper was called to the mistake, he apologized for it, and stated that the substitution of names was a pure error.

Unfortunately the mistake did not end here. The Montreal Herald, which has adopted a bear attitude on paper stocks, re-copied the article from the Financial Times, without any attempt at verifying the authorship, and in spite of the fact that the responsible editor had been warned that the article had not been written by Mr. Beck. The article was given great prominence in the Herald, together with some comment which can hardly be called kindly. When the attention of the Herald was again called to the matter, they replied with a statement which was regarded as offensive in its nature. It was then decided to take up the matter with counsel, who was authorised to take whatever proceedings the circumstances seemed to warrant. This resulted in a more explicit apology on the part of the Herald.

In the meantime the statements which appeared in the Herald had been telegraphed to papers in the U.S., and were reprinted in at least one, and probably several, American publications, and was being employed to the great disadvantage of Canadian newsprint producers.

The views expressed in the article are so contrary to the policy of the Association, that its appearance, with the name of Mr. Beck attached, naturally caused bewilderment, particularly to those who know Mr. Beck intimately. The incident, too happened at a period when Mr. Beck had just taken over the secretaryship of the Canadian Pulp and Paper Association, and from that personal point of view, was especially unfortunate.

The officers of the Association at once took measures to offset the damage done by the erroneous publication of opinions of members of the Association. The publicity has caused not only personal annoyance but damage to the interests of the association, and legal advice has been taken as to what further steps shall be taken to protect those interests.

Note:—For the information of those who may not have noticed it at the time, a direct reply to the statements of Mr. Adler appeared in the Pulp and Paper Magazine for Nov. 3rd, on page 1123 is interesting.

FORESTRY ASSOCIATION LECTURE SERVICE.

Educational enterprises sometimes take novel forms but few educational novelties seem to have proved more successful in gaining public attention than the especially-equipped railway coaches employed by the Canadian Forestry Association.

One of the coaches, stripped of the usual seats, is packed with graphic exhibits, including models of forests, showing the devastation of forest fires, fire protection apparatus, wireless equipment, electrically lighted show-cases displaying hundreds of strange articles made from wood such as imitation silks and leather, wood distillates, etc. There are electrical illusions giving transformation effects from a beautiful forest to a burned ruin, and by means of scores of beautiful transparencies illumined by electric globes the aesthetic side of forest preservation is made highly impressive. In short, the purpose of the Forest Exhibits Car is to drive home the lesson that forest fires are a public enemy, affecting the personal welfare of every citizen of Canada.

During its tour of six months, more than 120,000 people visited the car. The trip covered approximately nine thousand miles. Every evening motion picture lectures were given by English and French speakers.

The Association's second travelling enterprise, the Tree Planting Lecture Car, travelled eight thousand miles in Manitoba, Sackatchewan, and Alberta, and fifty thousand people attended the tree planting lectures and demonstrations given by Mr. Archibald Mitchell, a well-known western expert, and his assistant.

The purpose of the Tree Planting Car is to take information and inspiration through a novel and interesting medium right to the front door of the settler who has greatest need of such help. The fact that the enterprise was connected with no government or commercial interest and was purely a citizen's movement gave it a particular appeal. Mr. Mitchell, the chief lecturer, has a great gift for rousing the interest of farmer audiences and a thorough mastery of the whole subject of tree planting under peculiar prairie conditions, gained by thirty years experience.

The Lecture Car was built with a sloping floor and special seating, so as to contain from 125 to 150 persons and at every stop, two illustrated lectures and demonstrations were given. In numerous instances, municipalities were supplied with complete working requirements and all sorts of societies were given practical help in improving school and church grounds.

The inspirational effect of such a tour cannot be over emphasized, for tens of thousands of men, women and children to-day have an intelligent comprehension of the value of shelter belts of trees in home beautification, in the prevention of soil drift, the protection of buildings and live stock and the improvement of moisture conditions.

Even in a highly unfavorable business year the Canadian Forestry Association succeeded in financing its educational enterprises from private sources with the aid of a few small government grants. The work will be continued throughout the winter through other channels developed by the Association.

Quite a lot of men have struck for shorter hours. They've got them all right, they're out of a job.

Don't look like an accident going somewhere to happen.

British Trade News

(FROM OUR LONDON CORRESPONDENT.)

London, Nov. 17, 1921.

It is regrettable to record that the Norwegian Steamer "Alf", which carried a crew of 18 hands, has been lost in the North Sea during a gale. The vessel was carrying a cargo of wood pulp to Queenborough from Drammen and 16 of the crew were lost.

Wood Pulp Association.

Owing to the exigencies of trade, the unsettled state of affairs, and other elements the British Wood Pulp Association will not hold their annual dinner this year. Heretofore, the event was one of the social functions of the year.

Newsprint Industry Hit.

The well-known makers of newsprint, Messrs. Thos. Owen & Co. of Ely Paper Works, Cardiff (Wales) announce that the half-year's dividend on the preference shares is being paid, but they much regret being unable to declare an interim dividend on the ordinary shares. The adverse conditions in trade and fall in values were especially marked in the papermaking industry, and the Directors say that so far there have been recently only slight signs of improvement.

Pulp Imports Reduced.

There was a falling off in the shipments of pulp to the United Kingdom during October—figures for which have just been issued by the Board of Trade. The total reached 46,942 tons, compared with 88,976 tons in October 1920. For the ten months, January to October, the supplies are 446,854 tons—all kinds of pulps—as against 925,663 tons in 1920—roughly one half of last year's shipments. To show what the pulp agents have been losing one has only to turn to the value of the shipments and I find the ten months' supply this year is put at £10,360,557, whereas last year, for the same period, the value stood at £24,369,029. The countries of supply are as follows for October last:—

Canada shipped 93,371 tons of wet groundwood for the ten months compared with 73,001 tons in 1920 and these figures are only beaten by Norway, a country that sent 146,853 tons between January and October as against 263,937 tons. The Dominion enjoys the unique position in groundwood of sending more shipments than the 1920 quantities. Another interesting point is while Norway values her 146,853 tons at £1,606,757, Canada's 93,371 tons are valued at £1,403,627.

Bleached Chemical (Dry): From Finland, nil; Sweden, 355 tons; Norway, 410 tons; Germany, 44 tons; Other countries, 50 tons. Total 859 tons as against 2,545 tons for October 1920 and for the ten months 11,556 tons, as against 24,490 tons.

Unbleached Chemical (Dry): From Finland, 3,539 tons; Sweden 9,852 tons; Norway, 1,175 tons; Germany, 89 tons; Other countries 1,162 tons. Total, 15,817 tons, as against 35,485 tons in October 1920 and for the ten months, 164,732 tons as against 424,517 tons in 1920.

Chemical wet: 808 tons in October, a reduction of 192 tons and for the ten months 1,878 tons as against 10,520 tons in 1920.

Groundwood (Dry): In October nil (October 1920 1,146 tons); for the ten months 3,076 tons valued at £50,835 as against 26,696 tons, valued at £754,879 in 1920.

There is today a small demand for groundwood. For other pulps the market shows more brightness and more enquiry, but the volume of business passing is not great. Prices are as follows:—Groundwood (wet) £4 15s; Groundwood (dry) £9; Bleached Sulphite (No. 1) £20; Easy bleaching £14½; newsprint quality £12; Unbleached Soda £11; Soda Kraft £11.

Exports of Paper.

The question may be asked: Is the British paper industry going ahead, or is it at a standstill? To the last part of the question the answer is in the negative and to the first part it should be explained that while there was an unprecedented demand for paper in 1919 and part of 1920, the fact remains that the domestic supply and the export supplies are not finding the consuming channels manufacturers would like them to. The rates of exchange and dullness in the markets abroad are telling factors and in the home market cheap foreign papers are to be met in all directions. Therefore, when we compare the exports between January and October this year with the same period last year, there is a falling-off to the extent of 32,065 tons of paper, so that it can safely be said the headway of the British mills n the export trade is, up to the present, small.

The total exports, including playing cards, boards, paper bags, etc. reached 120,944 cwts in October, as against 241,407 cwts in October 1920 and for the ten months 1,190,384 cwts, as against 1,831,688 cwts in 1920.

Paper Imports.

The imports of all kinds of papers, boards, etc., for the ten months, January to October, inclusive, are 266,-704¾ tons, compared with 572,438¼ tons in 1920—or, roughly, a decline equal to about one half, so that foreign mills are feeling the pinch in their export trade just as much as the British. Newfoundland shipped 158,690 cwts of paper in October which is above the supply for the same period last year, but, still, for the ten months the 1920 figures have not yet been reached.

The Outlook.

The outlook, after the exports and imports have been studied, is not a very bright one for either mill men or pulp men in the United Kingdom. At present most of the mills are choked with raw materials and the tendency is to run machinery for the sake of keeping it going and oiled. The position of the pulp man is consequently not an envious one. Dull trade in paper is reflected on him and old contracts are gradually working their time out. From all accounts that reach me the mills are producing paper on high priced pulps—not pulps at the present day quotations—and to keep a footing in the market the paper manufacturers are compelled to sell below the cost of production, which is certainly not a paying game for any concern. With such domestic affairs, and depreciated rates of exchange abroad, it will readily be seen that the pulp and paper men of the United Kingdom are in a hard and tight corner and two elements are against them, viz.: (1) the demand for and the abundant supplies of cheap imported paper; (2) the money markets abroad. Within the last nine months, economy has been preached up hill and down dale with the consequent result that the British mills received a rude shock and during this shock the cheaply produced foreign product crept in and to-day it is in demand on all sides from a public point of view. It is now a question of time for the cheap article to be beaten down, at home and abroad, When it is, pulp men may look for a revival in trade.

PREFERS AMERICAN BOX BOARD

Incidental to the discussion of the practice of stamping Canadian made shoes with American names, which was recently brought up as a political argument, the Toronto Globe has something interesting to say about the use of American boxboard by Canadians. The passage reads:

While Mr. Frank S. Scott declares his shoe factory in Galt has discontinued stamping Canadian-made shoes with the American Eagle and American markings, he evidently prefers to get his cardboard cartons—in which he sends out shoes from the Galt, Ontario, house of Getty & Scott, Ltd.—at Monroe, Michigan, U.S.A. The cartons are marked "The Classic Shoe. For Children. Getty & Scott, Limited, Galt, Ont.," on two sides.

On one of the other sides appears the classification of the carton and underneath the makers. They are "The River Raisin Paper Co., Monroe, Michigan, U.S.A."

In Toronto, Niagara Falls, Montreal and other points there are firms manufacturing paper boxes for this trade. One Toronto plant has a capacity of 60 tons a day, and is not running full time, largely through American competition.

"Our product is a trifle higher in price than the United States product, due to the fact that we must pay for our pulp at United States currency rates. There is a 25 per cent. duty on these cartons. I might say that United States firms buy scrap paper in Canada and have been paying from $4 to $5 a ton more than current prices, but their object is to keep down the price of scrap paper on the other side by the small amount of Canadian scrap they can get," said one carton manufacturer of Toronto.

It was in his opinion that, when payment by Canadian firms in United States currency, freight and duty were taken into account, the difference in price between the Canadian and United States product would be negligible.

A traveller for Canadian cardboard cartons says that he was informed by a prospective customer who buys in the United States that he would not buy Canadian cartons even at 10 to 15 per cent. lower rates than those from across the line, because it was the intention to break the Canadian market and force supply of boxes at ruinous rates.

FORBEARANCE NEEDED.

I believe there is going to be a slow but gradual improvement in business conditions. It is my feeling we may wait a long while for a general activity. Meanwhile there must be mutual indulgence and mutual helpfulness.

Travellers exploring the ice-clad peaks of the Alps for their mutual protection tie themselves together; the nif one should happen to lose his footing he is supported and saved by the other members of the party. Business men are all walking in slippery places at this time. Any one of them is liable to take a tumble without warning.

It seems to me that while crossing this perilous track business men ought to tie themselves securely together. If one should stumble, others might thus be enabled to keep him on his feet.

You have noticed, perhaps, that when a tree falls in the forest it generally destroys, or at least injures, one or more other trees standing near it. When a business man or a business corporation fails, the disaster is seldom limited to the party that fails. Somebody else is apt to be hurt. One goes down and carries another down with him, and he in turn knocks the props from under a third, and where it will end no one can predict. Self-preservation, therefore, requires that we should stand together and avoid the beginning of trouble.

I think I can see better days ahead. There are rifts in the clouds that have hung over us for so long a time; but we are not out of danger and need to proceed with the greatest care. We want to be diligent, hopeful, courageous and, above all, to be patient and generous in our dealings with each other. In that way our recovery will be the more speedily accomplished; while a little imprudence might bring on a dangerous relapse.—C.F.M. in U. S. Paper Maker.

NEWSPRINT AND GROUNDWOOD EXPORTS UP.

Canadian pulp and paper exports for October were valued at $8,954,225, a decline of $9,751,780 as compared with October, 1920, and of $502,802 as compared with the preceding month of September.

Exports of newsprint for the month totalled 1,314,157 cwts., against 1,288,089 cwts. last year, an increase of 26,068 cwts. (1,303 tons), and exceeded September's figures by 190,021 cwts. (6,501 tons). They lost in value $1,404,690 compared with a year ago and gained $7,236 compared with last month.

Exports of pulp of all descriptions for the month fell off by 243,162 cwts. in quantity and by $4,490,235 in value as compared with last year, and by 56,388 cwts. in quantity and $594,914 in value as compared with September.

Exports of pulpwood for the month amounted to 47,023 cords, valued at $587,674, compared with 124,390 cords, valued at $1,752,923, in October last year, and with 49,608 cords, valued at $664,420 in September.

Comparative details for October, 1920 and 1921, follow the quantities being stated in hundredweights:

	1920		1921	
	Volume	Value	Volume	Value
Book paper	4,411	$ 43,802	2,239	$ 17,718
Newsprint	1,288,089	6,915,294	1,314,157	5,510,604
Other paper	.....	1,139,158	.....	338,397
Total	.....	$8,128,254	.....	$5,866,719
Sulphate	279,080	1,827,448	244,079	743,693
Sulphite, bl.	208,620	1,963,401	111,147	459,613
Sulphite, unbl.	402,565	2,800,095	271,018	852,341
Groundwood	536,329	1,986,807	557,188	1,031,859
Total	1,426,594	$8,577,751	1,183,432	$3,087,506

Countries of destination were: Paper—United Kingdom, $96,839; United States, $5,233,258; other countries, $536,622. Pulp—United Kindom, $660,758; United States, $2,164,008; other countries, $262,740.

Comparative figures for the first seven months of the current fiscal year show:

	Paper	Pulp	Total
1921	$39,246,227	$18,891,665	$58,137,892
1920	51154,018	52,795,463	103,948,481
1919	33,074,162	22,535,388	55,609,550

Exports of pulpwood to the United States for the seven months' period were as follows: 1921, $6,134,459; 1920, $9,556,255; 1919, $5,526,582.

SCIENCE FOR INDUSTRY.

London, Nov. 17, 1921.

Editor, Pulp and Paper Magazine:—

Apropos the editorial in the "Pulp & Paper Magazine" of October 27th last, headed "Drawing Blood," I commend a second reading of it to all pulp and paper men in the Dominion. Is it fully realized that the Technical Section is, as the editorial rightly says, "the bone" and "the papers and discussions the blood of the Section?" Let us hope that no one in Canada thinks the Section a makeshift. On it depends the future of the pulp and paper industries and the fact cannot be driven home too strongly. Up to the present the Section has been admired for its methods and those who do not sympathize with it must remember we are in an age of science—upon which our industries are gradually being worked—and that a new school is gradually coming to the front to revolutionize the work of the past. Therefore, Canada must "wake up!"

Sometime ago I heard Mr. Balfour, who is now at the Disarmament Conference on behalf of the United Kingdom, and whose knowledge of science must be respected, state that the industrial progress of mankind was going to be in the near future more and more dependent upon the alliance of science and industry and upon the co-operation of different branches of science with each other. Science is now, he added, an essential element in industrial progress. "I do not think the Germans have shown any greater aptitude for science than our own fellow-countrymen," he went on, "and I am sure they have shown no greater aptitude for industry; but beginning as they did rather late in the day, with their great powers of governmental organization, with their highly developed and equipped universities, and with the view which they have always entertained of the close alliance that ought to exist between knowledge and power, they naturally and easily did what we, with more difficulty and at a later date, are beginning to do. They marshalled, they mobilized all the forces of science in helping them to develop their great industrial efforts. We must not imitate them; but we must follow their example! They saw what, from the nature of the case, we could hardly be expected to see so soon—how close was this co-operation, how absolutely necessary it was, not merely in the competition of people with people of industry with industry, and of one community with another community, but from a broader point of view—the point of view that we ought to adopt is, that it is only upon our increasing knowledge of the powers of nature that we can expect to improve the material lot of man. But if you wish to improve the lot of man it can only be, not by quarrelling over the manner in which profits are to be distributed or by any of the controversies which divide various interests—it cannot be by those means, though they are subjects we cannot avoid—the thing which is really going to make a difference in the future, to make the remainder of the 20th century different from the 19th century, and the 21st century different from the 20th, is the command, for industrial purposes, which man has over the forces of nature. That can only be attained by the cultivation of pure science, of science for itself, of knowledge for its own sake. It can only be if we strive to breed and to educate men who, without any thought of selfadvancement, are consumed by a curiosity to know, and, that end having been attained, then to learn how to apply the knowledge which they have disinterestedly acquired to the great purposes of industrial development." Let industrial progress be the theme for all men in the Dominion's paper and pulp industries and at the same time bear in mind that the Technical Section is the medium for developing scientific organization.

—J. BOOTH.

REDUCTION IN FREIGHT RATES.

The Canadian Pulp and Paper Association have transferred their traffic department from Toronto to Montreal. Mr. G. Ruickbie, manager in charge of the department, has his office in connection with those of the association in the Drummond Building, Montreal. It is intended to give more attention to this department in the immediate future.

The department has issued the following circular on the revised freight rates as affecting pulp and paper shipments.

It is expected that most of the new tariffs providing for the general reduction in freight rates ordered by the Board of Railway Commissioners to become effective December 1st will be ready for distribution by the Railways early next week.

It may be several days after December 1st before tariffs applying between points east of Fort William and points west thereof can be got ready for distribution. In this event members will be well advised to keep a careful record of any shipments they may have moving between the territory in question as the Board's order is specific that the reductions shall take effect December 1st and if the Railways are unable to have their new rates in the hands of their agents and the shipping public by that time they will have to make them retroactive, to comply with the Board's order.

So far as the Pulp and Paper Industry is concerned rates on pulpwood and paper between points in Canada, Fort William and east will be reduced approximately 7.4 per cent, in other words the new rates will be 25 per cent higher than those in effect prior to September 13th, 1920 instead of 35 per cent higher as at present.

Between points west of Fort William the reduction will be 7.7 per cent or 20 per cent higher than the September 1920 rates instead of 30 per cent higher as at present.

Rates between points east of Fort William and points west thereof will be reduced in the same proportions.

Transcontinental commodity rates will be reduced about 7.5 per cent or to a basis 23 1/3 per cent higher than September 1920 rates instead of 33 1/3 per cent higher as at present.

Mileage rates on pulpwood in Eastern Canada for distances over 125 miles reduced last July and no further reductions will take place under the Board's order. For shorter distances rates will be reduced one half cent per 100 lbs.

Other raw materials (excepting coal and crushed stone) moving between points in Canada will be reduced approximately 7.4 per cent east of Fort William and 7.7 per cent west thereof.

The Board's order does not affect International rates nor export and import rates to and from seaboard ports, nor does it make any reduction in rates on coal as these were not advanced in September 1920 to the same extent as rates on other merchandise. It also excepts crushed stone rates which did not receive any increase in 1920.

What maintains one vice would bring up two children. —Franklin.

THE ONTARIO TIMBER PROBE.

By A. B. BAKER.

In the comment of the government investigation of former abuses in connection with timber leases much is heard of the amounts to be re-claimed by the Provincial Treasury, but little is said about the enormous cost of the investigation. The lumber companies have no doubt been exceedingly wicked. Some have made restitution, and others are said to have offered large sums in settlement. These have been refused and the probe continued.

As a matter of cold fact, however, it is purely a question of what money the government is going to recover. No one suggests for a moment that there was any actual and intentional fraud on the part of either the heads of the companies involved, or of the officials or ministers of the former administration. Carelessness or incompetence is about the worst that can be charged, and it is a question therefore whether the game of hide and seek is worth the candle—whether we are not spending far in excess of any possible recovery.

Under the circumstances, is not the Government very like the railway switchman in the plaintive old ballad telling how:

Out in the night rang the accents wild,
Switchman, oh! switchman! Save my child!
He threw the switch in the bat of a lid.
Killed eighty people, but saved the kid.

—Monetary Times

EXPORT PAPER CO. IS NOW RE-ORGANIZED.

Announcement is made by the Canadian Export Paper Company, of Montreal, that its reoganization plans, recently undertaken, are now complete, and that Mr. E. L. Crooker, of the Laurentide Company, is in charge of the company's affairs, assisted by a permanent board of management, representing Price Brothers and Company and the Brompton Pulp and Paper Company. The re-organization was brought about by a desire to bring the mills which export products through the company's agency into closer relationship with their customers.

The company now controls for export purposes some 80 tons of newsprint a day, the output of three of the largest and best equipped mills in Canada. This enormous tonnage enables them to undertake the entire requirements of even the largest consumers of newsprint without inconvenience or risk of disappointment, while the company's extensive operations also make possible the economical handling of its products and the prompt solution of any emergencies that may arise.

Mr. Crooker, the manager in charge, has long been associated with the paper business, and for several years past as sales manager for the Laurentide Company, Ltd., in which capacity he has represented the company both in the United States and Great Britain, as well as in Canada. He has an extensive acquaintance with newspaper publishers in all three countries.

U. S. PULPWOOD COMMISSION ABANDONED.

Washington, D.C.,—No United States commission will be appointed to seek the removal of Canadian restrictions upon the exportation of pulpwood was proposed in a resolution passed by the United States Congress last session. This was indefinitely stated at the White House yesterday.

The resolution, which was introduced by Senator Underwood authorized President Harding to appoint a special commission to confer with the Canadian authorities regarding the pulpwood restrictions.

It contained a hint of retaliation, the commission, under its provisions, being authorized to consider what measures could be taken to secure the removal of the restrictions, it was understood to have been passed at the behest of United States publishers who believed that with the resultant increase in supply from Canada to the United States mills the price of print paper in the United States would be reduced. Many United States paper manufacturers were also in favor of some such move.

The White House statement said that it had been definitely decided not to appoint any commission and added that if there were any cases of unjust discrimination they would be dealt with by the Canadian Government.

GUY TOMBS FORMS FREIGHT BROKERAGE COMPANY.

A step in the re-organization of the Canadian Export Paper Company, Limited, is shown in the following statement by President Chahoon:

"It has been decided to discontinue the traffic department of this company and Mr. Guy Tombs the general traffic manager has with our approval, formed a company to carry on the business of traffic managers and freight brokers, under the name of Guy Tombs, Limited, with offices at 285 Beaver Hall Hill, Montreal.

"We have pleasure in announcing that arrangements have been made with Guy Tombs, Limited, to supervise the transportation of paper sold by this company, therefore all communications having reference to such matters should in future, be addressed to them.

"Mr. Tombs, through his company, will continue to direct the traffic of the individual mills in this organization."

Mr. Tombs confirmed the report that he was going into business for himself.

"The decision to capitalize my thirty years of activities in transportation service was more or less forced on me," said Mr. Tombs, "by some impending changes in the composition of the associated paper mills in the Export Company, and the fact that the public insists on treating me as if I were still in the railway business. I have, therefore, obtained permission to take over on December 1st the traffic department of the Export Company under the name of Guy Tombs, Limited, general freight and shipping brokers. We will continue directing the tonnage of the principal paper mills and also undertake the solution of traffic problems generally, giving special attention to the handling of over-seas business through Canadian ports."

In addition to an experienced staff especially trained in export work, the new organization is fortunate in its directorate, which is as follows: President and manager, Guy Tombs, for many years assistant freight traffic manager, Canadian Northern Railway; Secretary, P. Daniels, late of the Canadian National Railways, Montreal; treasurer, Capt. W. H. Carling, M.C., formerly of the Bank of Montreal, London, Ont.; directors, N. P. Dalziel, secretary of the Canadian Export Paper Company, Limited; Mr. L. S. Colwell, Frank B. Common, M.A., B.C.L., of Brown, Montgomery and McMichael, and others identified with the pulp and paper industry.

PULP AND PAPER NEWS

A somewhat startling statement was made last week, by Professor J. H. Faull, of the Faculty of Forestry of the University of Toronto. In discussing the question of the toll taken by timber diseases in our unregulated forests, he said that these diseases, although not understood as well, cause greater loss than forest fires, destructive as the latter are. In these columns, attention is frequently directed to the appalling manner in which our forests are annually depleted by fire. Hence the foregoing statement by Professor Faull is nothing less than startling in the extreme. Professor Faull added that a better understanding of timber diseases would be of benefit as follows:

(1) Judging from Europe's experience in forestry, controlled forests can be kept healthy.

(2) A knowledge of timber diseases will make possible a more rational system of leasing and cutting.

(3) The importation of healthy stock can be almost assured.

(4) Industries can be helped in a choice of sound timber.

(5) Direction can be given to any scheme of reforestation that may be adopted.

The Professor mentioned the needle blight of white pine and butt or heart rot as two of the chief diseases. Studies have been undertaken in the Faculty of Forestry for the purpose of elucidating the factors and causes that favor these diseases, and adequate surveys with respect to these matters promise to give guidance in the choice of lands to be leased and that are ready for harvesting.

With respect to spruce, Dean Howe, of the Faculty of Forestry of the University of Toronto, also made a disquieting statement, last week. He said that owing to the methods of lumbering employed, spruce is being crowded out of the forest areas of Quebec, Ontario and New Brunswick, and that, in some places, it is being cut down six times as fast as it can be replaced by Nature. Dean Howe's judgment is valuable, for under the auspices of the Commission of Conservation, now abolished, he surveyed more than 10,000 acres of cut-over pulpwood lands to determine the rate at which spruce and balsam were re-establishing themselves after logging. He established 25 acres of sample plots where conditions affecting the regeneration of the pulpwood species can be closely studied through a series of years. In co-operation with certain pulpwood companies more than 600 acres of experimental cuttings have been established. The idea of this is to find some modification of the present cutting method that will increase the amount of young growth of spruce .

In accordance with an arrangement previously recorded in these columns, a deputation of striking printers, headed by Mr. Andrew Gerrard, president of Local 91, International Typographical Union, met Premier Drury, last week, and requested him to insist on Government printing being done in "fair" shops, and that it carry the Union label. They objected to government printing being turned over to sub-contractors by the Methodist Bookroom. A further conference has been arranged between the Premier and the striking printers.

Representations to the effect that 40,000 men are without employment in the St. Maurice district, and that unless immediate steps were taken to provide them with work, many of these would be exposed to starvation, were made last week to Premier Taschereau by Messrs. H. Ortize, manager of Grand Mere Municipality and Mr. H. Valiquette, manager of Shawinigan municipality. These two representatives asserted that the closing of the lumber camps, and the decrease in wages, had brought about the climax of the situation, and that something had to be done immediately. They further made the suggestion that public works should be started in all towns and municipalities where unemployment had reached such a pitch, and stated with regard to Grand Mere and Shawiningan, that those two towns were ready to defray the cost of one-third of such work if the Federal and Provincial Governments would provide for the other two-thirds of such cost. Premier Taschereau stated that the matter would be given consideration, and an answer given in a few days.

The town of Newcastle, and the Dominion Pulp Mill, across the river from Chatham, are in receipt of power from the hydro-electric power plant of the Bathurst Company, Limited, at Nepisiguit Grand Falls. An experiment was made on the opening day, and as everything worked satisfactorily, once a few minor changes had been effected, the transmission was immediately turned into a permanent operation.

Mr. A. L. Dawe has made several trips for the Canadian Export Paper Company, and has, we understand, secured some good business.

At the annual meeting of the Canadian Forestry Association, to be held in Toronto on January 10, a feature will be a discussion of means to secure a course of practical forestry.

Mr. T. J. Stevenson, President of the Riordon Sales Corporation, recently met with a slight accident. He slipped on the pavement of St. Catherine Street, Montreal, and fell, bruising his left shoulder to a degree which necessitated a sling.

The Book and Writing Paper Section of the Canadian Pulp and Paper Association held its monthly meeting in Ottawa on November 25. All the reports of trade conditions were of an encouraging nature.

The Forestry Branch News Letter, No. 194, issued by the Dominion Government is an interesting and well gotten up sheet and shows the attitude now being taken by the Dominion and Provinces of getting the people at large interested in public questions. The people must become interested in the people's business and once their interest is aroused progress will be rapid. The Government of Ontario is doing much the same thing by carefully prepared matter issued to the newspapers giving the public information and instruction in forest fire protection and tree planting.

NORWEGIAN PULP MEN VISIT CANADA.

Mr. Christian Vig, managing director of the Hunsfos Company, manufacturers of newsprint, Christiana, Norway, paid a short visit to Montreal during the week of November 21. Mr. Vig was for many years operating manager of the Union Company, the largest paper manufacturers in Norway, and is regarded as one of the ablest men in the Norwegian paper industry. He was accompanied by Mr. John Poulsson, managing director of the Norwegian Cellulose Association, Christiania, and also head of the Toten Cellulose Company.

These gentlemen called at the office of the Canadian Pulp and Paper Association, and thanks to the good offices of Mr. G. F. Steele, visited the plants of the Laurentide Company, Grand Mere, and of the Belgian Industrial Company, Shawinigan Falls. Mr. Steele also entertained the visitors to luncheon at the Ritz Carlton Hotel.

In discussing future possible competition of Norwegian paper mills with those of Canada, Mr. Vig gave the impression that, on the new price basis for Canadian paper, recently announced, there is not a great deal of latitude between Canadian prices and those at which Norwegian mills can afford to lay down their production in the U. S. Mr. Vig totally discouraged the idea that the Scandinavians are out to secure any undue advantages over Canadian and American competitors in the American market. He also scoffed at the suggestion which is being freely circulated by some American publishers that Scandinavian paper in large quantities can be laid down in New York and sold at a price of $50 per ton or thereabouts.

Mr. Vig was much impressed with the Canadian mills he visited. He stated that Norway had nothing to compare with the Laurentide plant and he had not seen anything to equal it elsewhere.

The object of the visit was to enquire into conditions here and in the United States. Mr. Vig and Mr. Poulsson left Montreal on November 23rd for New York, with the intention of sailing for home in a week or 10 days.

NEWSPRINT PRODUCTION INCREASED.

New York, November 21.—Forty-four newsprint companies in the United States and Canada, comprising more than 90 per cent. of the total, reporting to the Newsprint Service Bureau for October had an output of 156,844 tons of paper. Shipments amounted to 165,265 tons. Production includes 1,713 tons of hanging paper usually classed with newsprint.

October production was 13,372 tons (9 per cent) increase over September output. Shipments increased 22,972 tons, or 16 per cent. There was one more working day in October than in September.

Production by United States mills, according to the Bureau, during the first ten months of 1921 was 252,161 tons, or 24 per cent. less than the corresponding of 1920. A strike which tied up some mills for more than two months early this year restricted output.

Production of Canadian mills ten months of 1921 decreased 79,447 tons compared with 1920, a decline of 11 per cent. Combined production, in both countries, was 331,598, or 18½ per cent. compared with 1920.

Total stocks at mills October 31, 1921, were: 31,990 tons, equivalent to about four days' production. Stocks at the end of October were 8,640 tons less than September 30.

THE PULP OUTLOOK OF CANADA DISCUSSED.

At the recent meeting of the British Columbia Forestry Convention, which was held in Vancouver, interesting papers prepared by A. L. Dawe, secretary of the Canadian Pulp and Paper Association, Montreal, and by A. E. McMaster, secretary of the Whalen Pulp & Paper Mills, on "The Outlook of the Pulp and Paper Industry in Canada," were read.

In both papers the need of a more reasonable use of the timber resources of the country, and the adequate provision of methods of replacement was stressed. The industrial status of Canada, declared Mr. Dawe in his paper, depends in part, and in the future will be, directly dependent upon the success or failure of the timber industry, which is Canada's natural and greatest industry. Proper methods of handling timber, and of replacement were urged, the speaker declaring that it would mean the ultimate saving of costs in the pulp and paper industry.

In dealing with the pulp and paper situation in British Columbia, Mr. McMaster declared that the Pacific coast province had barely entered upon its career as a great timber producing country. He emphasized the need of research work, and deplored the lack of technical data on timber subjects in B.C. The total value of pulp and paper industries in B. C. in 1919 was $12,000,000; and in 1920 this reached a total of $21,000,000. This year, declared the speaker, the total would be in the vicinity of $15,000,000.

IF I WERE BOSS.

If I were boss
And there should come to me
A worker who had failed most miserably,
But who had tried and done his best to make
Success, but stood defeated through mistake
I'd grasp that worker by the hand and say—
All right, old pal—more luck another day—
If I were boss.

If I were boss
And found a man who stayed
In shallow waters—timid and afraid—
To venture lest he fail—and played the game
So others caught the censure and the blame
I'd call that person to my desk and say:
You've just resigned, old top—be on your way.

—Griff Crawford.

WATER FLORA AS PULP.

A German mill is reported here to have secured a patent for its treatment of fresh water flora as a material suitable in the manufacture of pulp. Experiments have been carried out with it and the results are said to be satisfactory, so much so that a company is being formed. This is all the information available up to the present and it may be taken for what it is worth.

$75 PER TON FOR NEWSPRINT.

The Canadian Export Paper Company, Montreal, has officially announced a price of $75 a ton for newsprint sold under contract for the first quarter of 1922, a reduction of $5 a ton from the current price.

The height of harmony: French pheasants singing the mayonnaise.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 26th Nov.—Somewhat less activity has been in evidence in certain lines of the paper industry the last week or two. It would be easy to make too much of this, however. Business is still good—indeed, very good in comparison with what it was like three or four months ago — but it has, just now, a "spotty" and spasmodic look about it, in one or two directions, which those who should be good judges of the weather in the pulp and paper industry had certainly not looked for it to exhibit at this stage. It may be that this decrease in activity is due to the smaller demand than was anticipated for paper for holiday purposes. That is a view that one has heard expressed, though the writer cannot, for his part, coincide in it. What seems more likely is that the end of the year is approaching and, while at this season there is always a disinclination to carry over large stocks into the New Year, that disinclination is, this year, more pronounced than usual by reason of the uncertainty as to prices, and indeed, conditions generally which have been, until quite recently, so prevalent for a year now and the effect of which cannot be expected to wear off in a day. It is all very well for distributors of certain lines of papers to tell the consumer that no price recession is to be apprehended, but that on the contrary, an advance in prices, may be imminent. Quite frankly, the consumer does not believe them. He has, he says, heard this line of talk much too often during the past year to be in any way impressed with it. During this week, the writer happened to be in conversation with a couple of retailers doing business in a large way. The question as to whether the somewhat decreased demand now being felt would result in price recession happened to crop up for discussion. Both of them were confident that it would. On the other hand, a prominent producer, to whom the writer mentioned the opinion of these two men, utterly scouted the idea.

It is undoubtedly unfortunate that the condition of progressive betterment which, on the whole, has unquestionably set in, should have been delayed at all, albeit only momentarily. It is regrettable from a psychological point of view, because, in the light of its recent experiences, the industry is not in such shape as to take even a temporary setback in any excessively philosophical spirit. It is regrettable too, from a material viewpoint. For many of the manufacturers have been getting on the right side with Messrs. Profit and Loss only very recently, indeed. This week, one of the more prominent of the mill owners showed the writer confidentially the monthly figures, in this regard, relative to his concern. Only during the last three months—that is to say, September, October and the present month, so far as it has run—was any profit shown at all. For some of the preceding months the loss was of a kind literally to make one's hair stand on end. And yet, to read some of the articles in the daily press, one would imagine that the practice—or, as it seems, in some quarters, to be regarded, the pastime—of paper-making was synonymous with huge profit-making. However, though orders are not as yet showing signs of becoming heavy as quickly as had been anticipated, there is nothing in the situation thus far to detract appreciably, if at all, from the opinion that has been expressed of the outlook in these columns as distinctly good. That the general tone has immensely improved, during the last few weeks is a patent and obvious fact, while the prevalence of greater confidence is evidenced by the circumstance that mills are continuing to produce to greater capacity.

GROUNDWOOD:—On the whole, it is generally true to say that there is no money in groundwood to-day. News groundwood can be bought at the groundwood mills, for from $25 to $28 a ton. Prices of the best groundwood run from $28 to $35 a ton. These figures, it may be added, are based on prices that are actually being paid now. There is no supposition about them—they are the actual prices being paid.

PULPWOOD:—The sales of pulpwood continue to be very far from numerous. It is possible, according to those in a position to know, to buy peeled spruce at prices equivalent per cord to sixty per cent., less than those which obtained in the same localities about a year ago. Of course, if the present conditions of very limited cutting continue, as they appear certain to do, over the present winter, there may likely be a considerable shortage next year, with a consequent enhancement of prices, assuming a good demand.

PULP:—The somewhat better demand for pulp continues. But the prices that can be obtained cannot be regarded as satisfactory to those who produce it. For instance, prices actually being paid, at this moment, are as follows: For natural, $75 per ton; for bleached, $85 per ton; and for easy bleaching, $85 per ton. In each case, the price ought to be $5 per ton more to be moderately satisfactory to the concerns producing the pulp. The prices named are at the mill and in Canadian funds.

TOILETS AND TISSUES:—Mills report that they are running full on toilets and tissues. As regards the latter, it is possible that part of the briskness may be attributable to seasonal demands. But, on the whole, concerns producing these lines conceive that they have reason to be pleased alike with the present business they are doing and with the future outlook for their branch of the industry.

WRAPPING PAPERS:—The business in wrapping papers continues good. Particularly is this activity noticeable in the kraft aspect of the situation, and especially, in that connection, with the demand for glazed kraft.

MANUFACTURING STATIONERY:—Business in manufacturing stationery is brisk. A distinct improvement in this line has been noticeable in the last few weeks.

OTHER LINES:—In various other lines, the imminence of the Dominion election has had a somewhat unsettling effect. This is, perhaps, only natural in view of the prominence of the tariff issue in the present election campaign. When once the election is

OF DERBY HATS AND FISHING RODS, OF NAILS AND OTHER THINGS.

By C. B. SCOTT

Manager, Bureau of Safety, Chicago.

Once upon a time a man thoughtlessly walked into a generating station with a long steel fishing rod over his shoulder and the timely application of the prone pressure method of resuscitation saved his fast ebbing life.

Ever after and even to this day men about the plant are telling how foolish the man was. It was indeed a foolish thing to do, but not more foolhardy than some of the everyday thoughtless things many experi enced electrical workers do. A long steel fishing rod is no better conductor of electric current than a wire in a derby hat, a concealed nail in a shoe. The long rod is only more conspicuously visible and easier to place in contact with the source of electrical energy. We have only heard of one fishing rod incident, but we have also heard of fatal electrical accidents caused by the hat wire, the nails in the shoes, finger rings and watch chains.

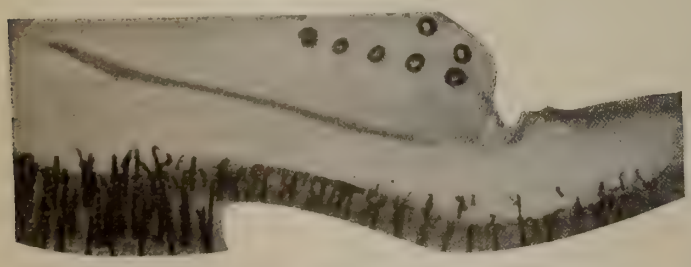
Invisible Hazards are Often Disregarded.

One reason why there are so many accidents due to electric current is because the current is not visible. Visible hazards are not so often disregarded as the ones which cannot be seen. Unguarded moving machinery looks dangerous even to the inexperienced.

Every person does not so readily distinguish the invisible current of electricity. Men employed in the business of electrical production and distribution often have to apply a test to ascertain if wires or equipment are electrically alive or dead. It logically follows that greater care is required in connection with electrical hazards than in the presence of the visible sources of danger.

Too little attention is given by electrical workers to the subject of unsafe clothing, and by unsafe clothing we mean clothing containing metal parts. No workman in a generating plant is safe while wearing shoes with metal nails, a hat with wire in the brim, metal finger rings, watch chain, clothing with metal buttons, glasses with metal or flammable frames.

Men who persist in ignoring these things need urgent admonition just as much as did the unwise fisherman In fact, they need it more, because anyone could see and appreciate the folly of the man carrying the fishing rod.



Electrical Workers' Shoes Should Have Wooden Pegs, Not Nails.

Shoes worn by men subjected to electrical hazards should have wooden pegs instead of metal nails, derby hats and cap visors should be examined for metal parts and if they contain these should not be worn.

Inflammable visors or eye shields should be prohibited. To sum it all up, particular precaution should be taken not to wear any clothing about electrically charged wires or apparatus which contains any metal or inflammable part. No metal trinkets should be worn.

The difference between visible and invisible hazards is clearly shown in the accompanying illustration of the anatomy of a pair of shoes which were worn by a deceased electrical worker at the moment of his decease. The picture is prima facie evidence of a danger almost as obvious as a picture of a man entering an electrical plant with a steel fishing rod on his shoulder.

—National Safety News.

FORESTRY MATTERS IN CONGRESS.

Washington, D.C., Nov. 30.—The whole American forestry question will be threshed out before the Agricultural Committee of Congress in a solid week of hearings beginning January 9.

This is the announcement made by Chairman Haugen of that Committee and comes as the climax of a year of work by the National Forestry Program Committee to get a through plan for the maintenance of the nation's forests before Congress for action.

It is just a year ago that the National Forestry Committee was named, with the paper industry, as represented by the American Paper and Pulp Association, the lumber industry as represented by the National Lumber Manufacturers' Association, the public as represented by the American Forestry Association, the publishers as represented by the American Newspaper Publishers Association, and other national and local groups, as members of the committee.

From this union of widely different interested groups, all realizing the need for unified action in behalf of the forests, came the Snell bill, in which the widely differing ideals of different groups were harmonized in the first comprehensive plan for forestry legislation to be offered in Congress.

Hearings last January came as Congress was about to adjourn, and action went over to the sixty-seventh Congress, where Congressman B. H. Snell again introduced his forestry bill, as approved not only by the Federal Forest Service, the American Forestry Association, the American Paper and Pulp Association, the American Newspaper Publishers Association, but also by the National Lumber Manufacturers' Association, the American Association, of Wood Using Industries, and other similar groups.

The introduction of essentially the same bill, carrying in addition a provision for federal assistance in establishing Roads of Remembrance of trees, followed in the Senate, Senator Medill McCormick of Illinois being the sponsor.

In all this campaign the paper industry has figured as one of the leaders. Its program, outlined at a hearing before the committee, was formed, was adopted in principle, and the Central States Forestry League, consisting of the eight states of the lake region, has practically accepted for the central states program, the recommendations of the forestry committee of the American Paper and Pulp Association of which Frank L. Moore is chairman.

The Beveridge Supply Co., Montreal, have taken a very active part in the "Better Package" campaign. They sent out a lot of literature in both French and English.

The Port Arthur Shipbuilding Co., Canadian builders of the Niagara beater have just issued an attractive leaflet on this new development in paper making machinery.



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over, and a clearer view of tariff possibilities is obtainable, the unsettlement will likely largely disappear.

NEW YORK MARKETS.

New York, Nov. 26.—(Special Correspondence).—Business in paper, insofar as regards transient demand, has been rather quiet this week in New York, yet the market as a whole is characterized by a good deal of life, and reports generally say that operations at mills have diminished but little. Here and there a paper manufacturer has found it necessary to curtail production to some extent because of the slowing down of current demand, but a large majority of paper and board mills are running at a good rate of capacity and have sufficient orders on file to absorb practically all of their output for some weeks ahead. It might be said therefore that while retail trading in most grades of paper has quieted down, the industry at large, and particularly the manufacturing branch, continues fairly active.

It is not surprising that demand for paper has eased off at just this time. The fact should not be lost sight of that during the past several months consumers have bought quite heavily—many, no doubt in large enough volume to cover their requirements for a time ahead. It is but logical that some of them have now let up in their buying, being satisfied to keep out of the market for a while when having wants taken care of by paper on order, and presumably desiring to reduce their stocks for the approaching inventory-taking season. For this reason a consensus of opinion is that general business, aside from retail buying for the holidays will rule rather quiet up until the close of the year. Following that time, everyone is looking for the markets to open up with a rush, and for brisk business.

Announcement of a further cut of $5 a ton in the contract price of newsprint for the first quarter of 1922 by Canadian manufacturers was not unexpected here. This matter has been the chief subject of discussion in the local trade for some time, and it was generally anticipated that a reduction of approximately the size made would be announced. Trade sentiment now is that newsprint prices are down very near to complete readjustment. There are some who still stick to the belief that prices will eventually work down to around 3.50 cents per pound or a quarter of a cent. a pound below the $75 a ton basis fixed for first quarter of 1922 deliveries by Canadians, but there are few, if any, who look for print paper values to fall below this level. It must be acknowledged even by consumers that the statistical position of newsprint is very strong. Consumption in the United States is holding up remarkably well this year, running only about 4 per cent behind 1920, the largest on record, while it is estimated that mills in this country will produce 300,000 tons less this year than last, owing principally to operatives' strikes, which have not yet been settled in a good many plants. Import figures do not strengthen the belief that German paper can affect the American market to any great extent. German and Scandinavian countries this year will not send the U. S. much over 100,000 tons of newsprint. We will require approximately 2,000,000 tons, so that the difference between our production, estimated at 1,200,000 tons in 1921, will have to be made up by Canadian producers who normally supply one-third of our needs. Members of the trade are discounting the bugaboo of German competition. Advices from authoritative sources on the other side of the Atlantic say that some contracts from American publishers have actually been accepted by German paper producers at 2.50 cents. a pound, but that deliveries will not be made against orders at this price. Current prices on German and Scandinavian newsprint range around 3.25 cents. per pound landed, and it seems very doubtful whether foreign newsprint will be shipped here at less than this cost for a long time to come, with the obvious result domestic and Canadian manufacturers should easily be able to maintain their prices at 3.50 cents or a little higher.

Book papers hold steady in price at around 6.50 cents. per pound, basis on machine finished book f.o.b. New York, and are moving in fair tonnage against back orders though fresh demand is slow in developing. Tissue papers are firm and in rather good demand. Kraft wrappings are freely sought by consumers and jobbers, and quotations rule steady at 7 cents basis f.o.b. New York on No. 1 domestic kraft. Fine papers are holding their market position moderately well, with demand showing a gradual increase. Plain box boards are in quieter demand and prices have sagged a bit further to about $37.50 per ton, f.o.b. New York, on filled news board and $35 on plain chip, but container boards and corrugating boards are in active demand. Mills making container boards are rushed, and the trade is commencing to feel that the present situation in this industry is not due to pre-holiday seasonal reasons but to a permanent increase in the use of fibre containers for shipping merchandise.

GROUND WOOD:—There has been a slight slowing down of demand for mechanical wood pulp, but the market tone rules firm and quotations are on steady levels. Indications are that a majority of grinders

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have disposed of the bulk of their output for sometime ahead, and, being handicapped in increasing production by poor water conditions, haven't much surplus to dispose of and therefore are enabled to refrain from pressing buyers. Between $30 and $33 per ton at producing mills is the general range of prices of domestic and Canadian grinders, with importers of Scandinavian ground wood reported asking $34 and higher per ton, ex the dock, for pulp on the spot in this country.

CHEMICAL PULP:—Although reports mostly are to the effect that paper manufacturers have let up in their buying of chemical pulp to a very noticeable extent, the market continues to exhibit considerable activity and quotations are well maintained. There is a particularly good call for bleached sulphite and for kraft pulp. Domestic producers of the former are understood to be sold up for several months ahead, and the few lots of strictly No. 1 bleached sulphite that become available in the spot market off and on are said to be freely bringing 4.50 cents. per pound, while quotations in this connection are strengthening as December 1 draws near when the new contract basis of domestic producers of 5 cents. per pound on bleached sulphite becomes effective. Foreign bleached is quoted at 4.25 to 4.50 cents., ex the dock, and it is stated that a large New England paper mill has just contracted for a big tonnage, said to approximate 1,000 tons of bleached sulphite of Norwegian origin at 4.50 cents., shipments to begin next month. The bulk of demand for kraft pulp emanates from container board mills, which are very busy and which are buying about all the kraft fibre offered at between 2.75 and 3 cents. on No. 1 domestic kraft and around 2.65 cents. on Scandinavian kraft.

RAGS:—Paper-making rags continue in a rather quiet market condition. Most consumers evidently are more concerned with reducing present stocks than in augmenting their holdings at this time, and are limiting purchases almost solely to rags immediately and actually needed on current runs of paper. Prices in most instances show a downward trend, though a great many dealers who appreciate ruling conditions are not exerting undue effort to market goods at the moment. Roofing rags in New York have eased off further, sales being reported at $1 a hundred pounds for No. 1 packing and at 85 cents a hundred on No. 2 roofing f.o.b. this city. Old thirds and blues are slightly lower, with repacked blues reported offered to mills at 1.75 cents. per pound New York, and rough packing at 1.35 cents. New white shirt cuttings also are lower and in less demand. No. 1 white shirt cuttings are available at as low as 10 cents. a pound New York, fancy shirt cuttings at 5.75 cents., new unbleached muslins at 9 cents., white lawns at 8.50 to 8.75 cents., and new No. 1 washables at 4 cents.

PAPER STOCK:—After experiencing steady and rather sharp recession for a period of several weeks, prices on most grades of old paper appear to have steadied somewhat. This seems due, however, more to the fact that prices have worked down to levels where little profit is accorded packers, who have consequently reduced their production, rather than to any broadening of demand from consuming sources. Board mills are buying in fairly regular fashion but in light volume, and folded newspapers are freely available at 65 cents and less per hundred pounds f.o.b. New York, and No. 1 mixed papers at 40 cents. Old book stock is bringing no better than 1.30 cents. a pound New York, with most sales at 1.25 cents, while shavings are quoted down to 3.50 cents. on No. 1 hard white and 3 cents on No. 1 soft white shavings. Old No. 1 kraft paper is selling at 2 cents per pound f.o.b. this city, white blank news cuttings at 1.90 cents, ledger stock at 1.65 cents, and No. 1 print manilas at 1.05 cents.

OLD ROPE AND BAGGING:—Old manila rope holds steady in price and dealers report a ready outlet among paper mills at close to 5 cents per pound at shipping points for rope in No. 1 condition. Imports of old rope are increasing, yet available supplies seem only about ample to cover buyers' wants. Old bagging is in dull demand and quotably easy. No. 1 scrap bagging is offered by dealers at 90 cents. a hundred pounds and No. 1 gunny bagging at around 1.10 cents.

GERMAN PAPER DELUGE SUBSIDES.

As having a significant bearing upon the extent and character of European competition in the world's markets with Canadian and American producers of pulp and paper a statement in the current issue of "The Newspaper World," a London, England, weekly journal, published in the interests of the newspaper industry, is of interest.

"Foreign competition, in so far as it concerns German-made paper, is assuming a rather peculiar attitude," says the Newspaper World. "During the past few months quotations have been given very freely at ridiculously low prices, under-cutting everything else on the market, and if all reports are correct, orders have been as freely booked. Even the most patriotic of buyers and those most loyal to British industries could not resist the tempting offers placed before them. For instance, a line of paper, the best quotation for which from British or Scandinavian mills was 5d. per lb., has been offered by German mills at 3½d. No buyer dealing largely in this class of paper could afford to let such an opportunity slip. If he did he would soon find himself out-quoted by competitors who put business before patriotism. The orders having been booked and sent across to the mills, and the time for delivery having arrived, buyers are disappointed at finding that the goods are delayed and that comparatively little has come to hand. The German agents now say that things do not look very hopeful over in that country and that no time for delivery can be guaranteed. The sudden fall in the value of the mark is given as one of the primary causes of delayed deliveries. It is stated that food prices have rushed up to such an extent in Germany that there is great discontent amongst the workers, and though reports that come to hand say that the mills are full of orders and working full time, the export output to this country is comparatively small."

Buyers of German newsprint in the United States are said to be meeting with similar experience. German paper which was confidently expected in some quarters to break the price of American and Canadian paper to a pre-war level or below is now said to be forthcoming in quantities insufficient to affect generally market quotations.

Scandinavian paper manufacturers, recently in this country, state that American and Canadian prices announced for next year are on a scale such as it will be very difficult for Scandinavian producers to undersell and make any profit.

Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P. Q., December 8, 1921. No. 49

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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EDITORIAL

THE FUTURE OF THE FORESTS.

When such a body of men as the Associated Boards of Trade of Northern Ontario come to the conclusion that reforestation is a waste of money under present conditions as regards protection from fire, we should consider that the Provincial Government has a very clear challenge and an unmistakable indication of where its duty lies in regard to forest policy. An enthusiastic forester and an ardent advocate of reforestation under proper conditions stated that to plant out trees in Northern Ontario as things are now is equivalent to feeding them to a furnace. During the discussion it was clearly pointed out that the loss to the Government in annual revenue is enormous, and the restriction on industrial development is serious, which of course means a lack of available employment for the population both in the mill and in the woods. Destruction of timber by fire is a direct, complete and irrecoverable loss of a natural resource that is Canada's capital.

The way out of the present difficulty was indicated as lying principally along three lines; in the first place, the evidence is conclusive that slash must be destroyed before it destroys the remaining timber; second, a greater proportion of the revenue from the forest must be returned in protective measures, and third, more effective means must be developed for educating the public to the value of the forest and the necessity for preventing fires from starting. The burning of slash has been advocated as a prime factor in making the forest safe and the desirability of slash disposal is admitted almost without exception by timber operators. Practically the only objection is the disadvantage that will be laid upon one group if all operators are not required to observe the same regulations. With opinion so nearly unanimous in favor of such a procedure, there is surely nothing but criminal indifference on the part of a Government which either lacks the sense or the courage to pass legislation that will adequately cover the situation and put all operators on exactly the same basis, whether they be exploiting their own lands or those belonging to the crown. The Government has just as much right to require a private operator to dispose of his slash in order to reduce the fire hazard to his neighbor as a municipality has the right to require a person to keep his premises reasonably free from fire hazard. The present season is a particularly favorable one for instituting proper disposal of logging debris. Lumbermen are working for low wages and in face of general unemployment the addition of a few more men to a logging crew would not be a great expense and would result in an all round benefit.

The amounts of money which our Provinces and Federal Government return to the forest are simply ridiculous. The people of Canada have a heritage of incalculable value in the forests and water powers, each of which supplements the other when it comes to industrial development and one is dependent upon the other for its principal value. Several of our provinces benefit enormously by stumpage dues, in fact the forest is the principal source of provincial revenue. The amount spent in improvement of the property is practically nothing and the penuriousness of our Governments in their expenditures for protection, is absurd. A person who, because a valuable house had been willed to him failed to carry any insurance upon it, would be the laughing stock of his community. Yet Canada with forests potentially worth billions, is perfectly willing to see them gradually burned up. Then when the virgin forest disappears and a little new growth comes along, fire is again permitted to start and the forest gets another set back both in years of growth and in quality of production. After being thus treated several times to indifference and contempt, even nature gets discouraged and fails to produce anything but scrub.

This brings us to what is doubtless the most important factor in the situation, namely, the education of the public to the value of the forest and its extent. Education is necessarily based on truth. At the present time the truth with regard to the forest is far from us. It is not that conditions are intentionally misrepresented, it simply means that the truth has never been discovered. When it comes to coal, iron, gold and other minerals, we find that careful investigations have been made and estimates computed. The forest is far more susceptible to accurate determination of value than any of the other sources of wealth beneath the surface of the Dominion. The only resource which can be more accurately calculated is our water powers and even these are dependent for their reliability largely upon the maintenance of an adequate forest cover on the water sheds. The introduction of the air plane and aerial photography has made available an instrument for surveying our forest areas that was hardly thought of before the war but the war clearly demonstrated the value of the air plane for surveying and mapping and the first step could thus be quickly and easily taken towards a comprehensive inventory of our

forest resources. We could very soon have data from which to calculate the areas of forest land, showing the type of growth, the area in barrens, that in burns, the parts that are water and the extent of ravages by insect. Such a survey would form at least a basis for educating the public as to the extent of our forest and the immediate need for adequate protection measures. With such a start, there is no doubt but that the public would see to it that our capital is properly protected and so exploited as to bring about sane development and stable conditions.

COBWEBS.

The announcement by the International Paper Co. of their intention to accept orders at $70 for newsprint for 1922 came as a considerable surprise. Several explanations of the move have been made by people who may or may not know anything about it. We are in the latter class. It would seem, however, that there is about as much in favor of coming at once to the minimum possible price and stabilizing sales by yearly contracts as of dropping prices gradually over short periods and leaving the future more or less in doubt. Either plan to be effective should be practically unanimous or conditions are sure to be unsettled by the lack of concord. One thing seems sure; that prices are thus brought to a point where European print cannot be depended on as factor that can be used to disturb the market and discourage confidence in placing orders for future needs.

Canadian paper makers are learning how to present their products in most attractive form. Among the recent instances we should like to mention the folder showing Cloudland Covers produced by the Canadian Paper Company, and Library Blotting, produced by the Howard Smith Paper Mills. Both of these lines are comparatively new in Canada and we believe are fully equal, if not in some respects superior, to anything of the kind imported. The Pulp and Paper Magazine appreciates being advised and receiving samples of such interesting developments of the industry in this country.

A little while ago we received through the courtesy of Mr. William A. Aitken, a copy of a pamphlet entitled "Some Problems of the Paper Maker: Their Solution," this booklet contains reproductions of the patent specifications of a number of interesting developments with regard to paper machine operation for which Mr. Aitken is responsible. Many of our readers will recall the visit of Mr Aitken to this country some months ago.

Three men were discharged recently by a Canadian mill for playing tricks on the Watchman. It was a good lesson. Respect for law and order is a mark of civilization; willing respect and voluntary cooperation will go a long way toward making the officer of the law a friend and a guide and make property and happiness more secure.

There is some satisfaction in knowing that our prognostications of the election were not wrong—we didn't make any.

It now remains to be seen how generous the Liberals are.

Wonder if Parliament is Gouin to be led by a King.

MILL STOCKS DECLINED IN OCTOBER.

Comparing the stocks on hand at the domestic mills on October 31, with their average daily production based upon the combined production for 1918, 1919 and 1920, the figures of the Federal Trade Commission show that:—

Newsprint paper mill stocks equal 5 days' average output.

Rock paper mill stocks equal 10 days' average output.

Paper board mill stocks equal 8 days' average output.

Wrapping paper mill stocks equal 1 days' average output.

Bag paper mill stocks equal about 6 days' average output.

Fine paper mill stocks equal 28 days' average output.

Tissue paper mill stocks equal 13 days' average output.

Hanging paper mill stocks equal 32 days' average output.

Felts and building paper mill stocks equal 6 days' average output.

Miscellaneous paper mill stocks equal 23 days' average output.

Total paper mill stocks of all grades equal about 11 days' average output.

Comparing the stocks on hand at the domestic pulp mills at the end of the month, with their average daily production based on the reports covering the years 1917, 1918, 1919 and 1920, the figures show that:—

Ground woodpulp stocks equal 25 days' average output.

News grade sulphite mill stocks equal 9 days' average output.

Bleached sulphite mill stocks equal 3 days' average output.

Easy bleaching sulphite mill stocks equal 3 days' average output.

Mitscherlich sulphite mill stocks equal 4 days' average output.

Sulphate mill stocks epual 14 days' average output.

Soda pulp mill stocks equal 5 days' average output.

Mill stocks of "other than woodpulp" equal less than 1 day's average output.

Total mill stocks of all grades equal 14 days' average output.

Total stocks of all grades of pulp in the mills on October 31 amounted to 161,837 tons. All mill stocks decreased during the month.

The Superintendent and Cost Department*

By ED. T. A. COUGHLIN.
(Superintendent, Coating Div., Monarch Paper Co.)

I wish to say that it is with a great feeling of hesitancy that I am addressing you this morning as the representative of the American Pulp and Paper Mill Superintendents' Association to speak upon the important subject of "Co-operation Between Our Associations." I wish I had the time and oratory to suitably express the many reasons why a close co-operation should prevail between the superintendents and the cost department in every mill.

Last Monday evening I was one of the many eager listeners who had the pleasure of hearing your very worthy president, S. L. Bush, speak in Kalamazoo. I told Mr. Bush that I had come to hear him speak because I wished to obtain some pointers regarding what you would like me to say to you today. Mr. Bush replied that the things that would please you most would be as "empty mouthings" and that I should come out flat-footed and "spill the beans." Nevertheless, I gained an idea from his talk that impressed me very forcibly. He stated that one of the fundamentals of a cost system that was not generally recognized was its "dual purpose," namely, not only to arrive at a cost and selling price, but also to serve to direct, inform, control and guide the superintendent in the hundred-and-one details that daily require his supervision. I can readily understand from that statement the amount of help such a system would be to a superintendent.

Need of Proper Co-operation.

Cost systems have proven failures in some mills through various causes, but it appears to me that they will all fail to function properly unless there is proper co-operation between the superintendent and the cost department. To my mind the cost accountant should be a real diplomat to be able to put over his ideas to a hard-headed practical "super" who thinks such stuff is a "bunch of bunk" and that "liars will figure." However, this class of superintendent is in the very small minority at the present day. Most of the men that I am acquainted with are working heart and soul for the success of their mill and they thoroughly believe in cost systems, but naturally they are suspicious about things of which they know nothing.

There should be a complete understanding of the relative value of every daily report. The importance of correct records should be impressed upon the superintendent and he should be made to feel that upon himself rests the successful completion of the cost statements. This can all be brought about by the cost accountant by the use of diplomacy and salesmanship.

It has been my fortunate experience to be connected with a mill that has a very complete cost system and I know something of the hardships that were endured and of the difficulties which had to be overcome before it was possible to obtain accurate records and cost figures. In the first place the cost department did not have the proper backing of the manager or the superintendent. Daily records were tabulated which were known to be incorrect because the men in the mill had not been properly instructed regarding them or made to realize that everyone would be held responsible for the success of the system. By degrees, however, these troublesome factors were eliminated so that the cost system now works like a well-oiled machine. I think that the time wasted accomplishing this end could have been largely avoided by the right kind of salesmanship on the part of the men who installed the cost system.

A Reminder of Work Well Done.

To my mind a cost system is only "firing on a few cylinders" when it is content with the routine compiling of costs for office use only. To get all the real good out of the earnest effort put forth by the men in the mill in making correct figures available, they should be rewarded for their endeavors by some reminder that will show them that their work has been well done, or where they may further improve it. This can be accomplished very successfully by the posting of their totals, either graphically on some of the standard charts or by the preparing of a "batting average" in percentages. There is nothing more appealing to a workman who is conscientiously doing his daily duties than to gaze at this daily sheet and see the pleasing result. I know this to be a fact for I have tried it out. It stimulates production, reduces shrinkage, saves time and materially lightens the duties of the superintendent. Another important consideration is the opportunity it gives the superintendent to weed out the "dead wood" among the men.

We are planning our speakers for the Michigan Division Superintendents' meetings for the coming year, and it is my earnest desire that we may be able to locate convincing speakers on costs graphically illustrated. It is quite useless for a cost man to speak before a superintendents' meeting with his usual flow of technical phrases, but let him show charts or graphs of production, lost time, direct labor hours, comparative units of work, consumption of materials, distribution of power, shrinkage, avoidable waste, departmental expenses, etc., and he will find the superintendents intensely interested in what he has to say. The story can be told in a few simple words and with a great deal of understanding. I think that if a cost system is explained in this manner, the facts and figures will tend to make a very real appeal to the practical superintendent who is not so well versed in bookkeeping and accounting terms.

Several Kinds of Cost Systems.

There are several kinds of cost systems, which can be classified as complete, partial, and indifferent. A complete cost system is a priceles institution in any industry. A partial system is a source of endless trouble between the different departments, and in time will disrupt any organization, regardless of how competent the departmental heads may be. An indifferent system is even more of a menace than a partial one, for unless the accountants have the confidence and encouragement of the management, they will in time become discouraged, and it is in these mills that we hear it said—"Oh, yes, we have a cost

*Address given at the Drake Hotel, Chicago, October 6, 1921, at the Sixth Semi-Annual Convention of the Cost Association of the Paper Industry.

system, because our competitors have one, but we don't pay much attention to it in selling our products."

The paper mill chemist, together with the cost accountant, are the best friends any superintendent can have in the mill. He should realize their importance, accept their findings, and apply them in operating his department. The chemist's tests on raw materials enable the superintendent and accountant to arrive at the exact amount of the different materials that enter into the furnish of each beater. In this way a uniform product for each grade may be manufactured whenever required. The completed cost should be tabulated according to grades and weights, and variations from the normal cost should be brought to the immediate attention of the superintendent, thereby giving him an opportunity to investigate and take steps to remedy the fault, whatever it may be.

Must Be Based on Golden Rule.

Co-operation must be based on the Golden Rule, which unfortunately is a much abused saying. We use it unwittingly and lose sight of the splendid purpose it should convey. I cannot help recalling some chance remarks made by superintendents and cost men. One said, "He don't know anything about costs—his records are no good—his production is below normal—his material consumptions don't gibe, etc.—he's no good 'super.'" The other remarked, "It's a poor system—he don't know how to base costs—where did he learn that stuff?—he makes mistakes and then tells the boss I'm to blame." That was a fine co-operative spirit, wasn't it? How much better it would be if only these ideas could be eliminated and a feeling of confidence inspired in their place, so that some real progress might be made. Without the firm foundation of mutual trust and agreement all cost systems will go the way of the proverbial snowball. Let's get down to brass tacks and smooth out these flaws which we attribute to each other, and eventually the cost system will undoubtedly produce results beneficial to all of us. "Knocking" one another is a bygone pastime in real business. There is not one in this intelligent assembly today who can consider himself the perfect man from the point of view that he knows all that there is to know regarding costs. We are all prone to make mistakes, and faults can be found in each of us, if only the search is thorough enough. Why not admit these facts in a sane manner and lend our ears to the helpful hints and explanations, advice and counsel that we may be able to give kindly to each other?

Studies for Later Reports

The American Pulp and Paper Mill Superintendents' Association welcomes with joy the work your able committee on beater furnish has in hand. We will await with interest this committee's report, and you can rest assured we will do what we can to further the work to the best of our ability. We have several standing committees whose opinions you may feel free to call upon at any time. These committees consist of men, expert paper-makers everyone of them, who are making studies for later reports on such subjects as "Preparation of Halfstuff," "Ground Wood," "Sulphite and Soda Pulp," "Coated Paper," "Beater Room," "Machine Room," "Power and Water Supply and Purification" and "Safety First."

Any findings of your committee will prove of inestimable value to our membership and it will be our aim to spread such information over the records of our year book and other publicity journals. This kind of work, we believe, represents the true co-operative spirit that will be a benefit to the entire paper industry. Such work that tends to advance the art and science of the industry will be recognized by the mills not in your association at present, as well as by superintendents not now members of our organization, and it will be another added reason why they should join us.

There is nothing further, gentlemen, that comes to my mind except possibly to again suggest that on your return to your respective mills you should all endeavor to get better acquainted with your superintendent, chemist and departmental heads. Learn to know them sincerely and try to show them that you are one of their best friends in the mill and are really working for their interest, and in a short time they will open up their hearts to you on any subject. By developing this spirit of co-operation we unconsciously help one another and the results will, I know, be gratifying to the mill management, as well as to the individual.

ESSENTIALS OF FOREST POLICY.

In his remarks at the last meeting of the Northern Ontario Associated Boards of Trade, Mr. E. J. Zavitz said there was great need of a stock taking in regard to our forests, so we would know exactly what our resources are. Work on this had been started in the west by hydroplane and next year this district would be recovered.

Along Lake Erie in the nursery there were eight million seedlings. These had been mainly used in holding of sand dunes and covering of cut over lands. Reforestation in the North was difficult. No one would advocate planting out trees until the fire problem had been solved. It was planned to have demonstration areas to find trees suitable to all areas and this took a long time. It was not fair to compare Canada to Europe. In the latter fire hazard was small, in Canada great and different methods were therefore necessary.

There were three phases here:—

1. Protection of the pulpwood areas. In this there would be little difficulty if we could get the money. As long as slash was left on the ground fires would occur.

2. Protection of towns and settlements by fire zones.

3. Protection of agricultural settlements. The bulk of opinion was in favor of the continuation of the fire permits system. The big thing was education, for the bulk of fires was due to negligence.

The whole question came down to one of money. In Sweden 50 per cent. of revenue went back into forests. In Canada $500,000 had to protect 100,000,000 acres.

AUSTRALIA'S PAPER IMPORTS.

(From the Weekly Bulletin.)

Paper:—	1919-20 £	1920-21 £	Increase £
Cardboard, etc. ..	157,436	389,265	231,829
Printing	1,422,463	3,876,848	2,453,885
Wrapping	299,102	688,007	388,905
Writing and Typing	435,497	995,109	559,612
Other	535,699	1,126,800	591,101

Problems of the Sulphate Pulp Industry

Removal of Odors from Digester Blow in Sulphate Mills.

By GUSTAF F. ENDERLEIN.
Nekoosa-Edwards Paper Company Port Edwards, Wis.

The two articles in the last and current issues on the subject of Problems of the Sulphate Pulp Industry are contributed by members of the Sulphate Pulp Committee of the Technical Association of the Pulp and Paper Industry. The farmer and the resident of a town in the vicinity of a sulphate mill will appreciate the efforts of this committee. Such work is typical of the activities of our technical societies. It is the willing service and cooperation of such committeemen that is the foundation of the success of our industry.—Ed.

The problem of removing the disagreeable odors from the sulphate mill has been taken up from time to time, but a practical solution seems yet to be wanting, and undoubtedly much work and time will be necessary before a way is found that will work out satisfactorily and economically. The most difficult part of the problem is the removal of the odors from the furnace gases on account of their dilution and large volume. The removal of the odor from the digester blow is more inside of the possible with apparatus that is easy and relatively cheap to construct.

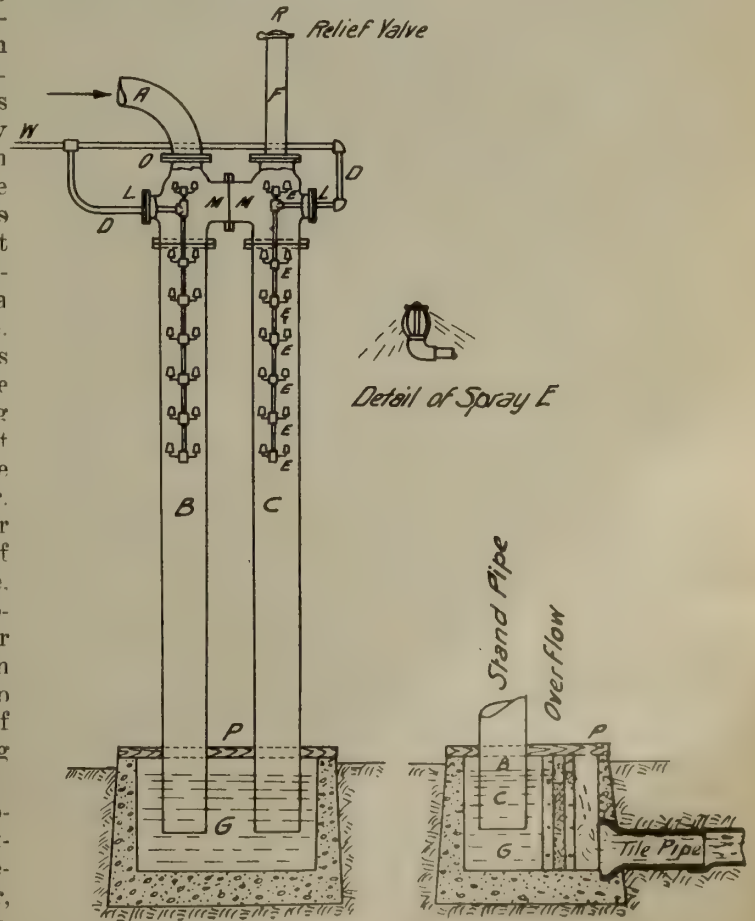
When a sulphate digester is blown, a certain amount of disagreeable odors from sulphide compounds will be relieved with the steam, and thrown out in the atmosphere. As these vapors usually are relieved on a relatively low level and have no chance to spread out in the atmosphere like the gases from a smoke stack, the odors will make themselves known at once and rather strongly, to the discomfort of the people living in the neighborhood. If this relief could be kept inside of a pipe or any other inclosure and not let out in the atmosphere, the odor would, of course, be eliminated. In blowing a digester a large amount of steam is relieved, as the digester usually is blown at a relatively high pressure, and to be able to keep this relief from going out in the atmosphere, every part of it has to be condensed. In some mills the relief from the blow is used to heat up wash water and in this way part of it is condensed, but the odors going off into the atmosphere apparently are as strong as before, as only a minute part of the odors is dissolved in the condensate. These condensers or heaters used are tube condensers or outside condensers. Cooling water and condensate are kept separate. This is of advantage when using the water for feedwater or for a similar purpose, but for reasons mentioned below, it is more of an obstacle than a help in the elimination of odors from the vapor.

To condense completely the relief from the digester blow with an outside condenser, a large amount of tubes would have to be used to give enough surface, and a large amount of cooling water have to be supplied, as the whole amount of vapor from the digester has to be condensed in the short time of ten to fifteen minutes. A prolonged blow-time would cause the pulp to hang up in the digester, which also would happen if the pressure in the digester were low at the beginning of the blow.

In the method described below the idea of the barometric condenser was made use of, instead of the outside condenser, in order to take care of all of the relief and produce a complete condensation of all vapor, and still not have to use an excess of cooling water. The barometric condenser has, as known, a spray in the top of a standpipe, vapor coming in at the top. As soon as the vapors come in contact with the spray they are condensed and a vacuum is created. The vapors and cooling water, going in same direction, are thus in direct contact with each other. To further the dividing of the cooling water in the standpipe, not only one spray, in the ordinary barometric condenser, was used, but a series of sprays, making, so to say, a series of condensers in one. In this case the cooling water is thoroughly mixed with the vapor which has to go through a very heavy mist. This is one of the main factors to eliminate the odors. As known, the ordinary water contains quite a considerable amount of air, which also will be mixed with the gases and, here is the point: by oxidizing the sulphide in largest degree will eliminate the odors. This will not be the case in an outside condenser, as here the water from the condensate, which is the only water that may eliminate some of the odors by dissolving, is the only water that comes in contact with the relief, and it does not contain any air and therefore no oxygen for oxidation of the sulphides.

In line with above ideas, a condenser was constructed and put in active service and found to work satisfactorily. It condensed practically all vapor relieved from the digester blow.

A reference to the accompanying sketch will make the construction and working of this condenser clear.



The relief gases from the saveall room are led through pipe "A" to the condenser, connected to the top at "C" to one of the two standpipes. The two standpipes used in this case are about 24" in diameter and were decided on as more convenient than one higher and wider. They are connected above by two crosses. The top opening on one is, as mentioned above, connected to the pipe "A" and the top opening of the other is connected to a 5" relief pipe "F" with a safety valve "R". Side-openings "M" are connected together, allowing the steam from relief line "A" to be divided up into the two standpipes "B" and "C". Opposite are the intakes "L" used for pipe lines for the cooling water. To the bottom openings of the crosses the standpipes "B" and "C" are connected. "W" is a 4" water line dividing into two 3" lines "D," one for each standpipe, entering the cross at "L" and supplying the water for the sprays "E". These sprays are arranged in pairs, the first pair being in the cross of the standpipe and the next one below the flange. The following pairs are about 24" apart. (They may be so disposed that one spray is not exactly over the others.—Ed.) The opening for the cooling water in the sprays is about ½" and tapered, through which it shoots up against a baffle plate which in turn is deflecting it downwards, as shown on detail sketch. The pressure in the water line is about 40 lbs. and the spray delivers the water with a good force. The water is also deflected from the sides of the standpipe and so making a very heavy mist along the entire length of the spraypipe and also below. The lower ends of the standpipes are submerged in a well "G", made of concrete, covered with a wooden top "P". The well "G" has a loose partition wall "K," by which the water level in the well may be raised so as to seal the outlet of the standpipes. The water flowing over the dam is taken care of by the tile-pipe "J" and may be directed to any place desired.

Just before the blow starts the feed valve for the cooling water on the 4" line is opened and the sprays put into action. At the time the blow starts, there is formed a back pressure, as the relief line from saveall in the diffuser room is directly connected to the condenser, which is water sealed at the bottom. At this moment, safety-valve "R" on relief pipe "F" starts to act and opens up, but as soon as the full steam is coming over it is condensed by the water spray and a vacuum is formed. As soon as the pressure disappears, the valve "R" closes up and no gas can escape there to the atmosphere. This valve may be of the simplest construction. A hinged top of wood with a piece of belting nailed on the underside answers the purpose. The water coming out at the well is very warm and could be used for washing or other purposes, as no smell can be detected at the well. This seems to prove the theory of the oxidation of the sulphides and that the disappearing of the odors is more an oxidation and less dissolving of the odors in the water.

PROVINCE WILL CUT PULPWOOD.

St. John's, Nfld., Dec. 5.—To relieve unemployment the Newfoundland Government has decided to again let contracts for cutting pulpwood on the Crown lands during the winter. The Government has still on its hands a considerable portion of pulpwood cut last winter, but it has hopes of making an agreement with the Harmsworth Pulp Mills to take a large quantity of wood.

PAPER MULCH PRODUCES MORE PINEAPPLES.

The system of paper mulching evolved by C. F. Eckart, former manager of Olaa plantation, Hawaii, for increasing sugar production, and patented, has been applied to the growth of pineapples and is revolutionizing that industry, according to a statement made by the Hawaiian Pineapple Company.

A roll of paper is laid out on the ground and rows of pines are planted through holes in the paper. The process is simple and the company claims the paper prevents all weed growth adjacent to the plants, saving much labor and leaving the cultivators free to pass between the rows. It avoids the necessity of hoeing the plants, saves the leaves and roots of the plant from being broken or bruised, protects and shades the ground, preventing its becoming baked or washed away, prevents evaporation, keeping the ground about the plants moist, giving the roots good feeding ground, absorbs the sun's heat, gradually transmitting it to the earth, keeping the ground warmer, especially in the night during cold weather.

Three Tons Increase.

J. L. Whitmore, acting manager of the Hawaiian Pineapple Company said experiments on their plantation had increased the production more than three tons to the acre.

Mr. Whitmore announced that the company had an option on the patents for their use in pineapple culture in the islands and that he considered it almost certain that the company will exercise the option. They may sub-license to their competitors as a part of their policy.

The Eckart system of paper mulching has been in operation for nearly three years on the Olaa plantation where the idea originated and was worked out to its present successful operation. All the cane grown on the Olaa plantation is fostered by this system. The paper is manufactured from the bagasse of the cane. Large paper mills are in operation at Olaa where tons of the pulp paper are made every hour.

The system used in cane mulching differs from that described in the Honolulu dispatch for pines. The paper is spread over the rows of cane after it is planted and the sharp pointed cane sprouts pierce the paper sheets, much as a pointed lead pencil is easily forced through a heavy sheet of brown paper.

Patent on Weights.

The labour saved by the Eckart patents is said to be fully fifty per cent. The increased yield in cane is about the same as that described for pines.

A curious thing about this process is that the patent is not on the manufacture of the paper or on anything more than the simple process of weighting the strips of paper to the earth with any small obstacle, a stone or chunk of lava being generally used. The idea of holding the paper to the rows until it has been pierced by the plants is the simplest idea which is likely to revolutionize all growing plants and enrich Mr. Eckart into the Henry Ford class.

In the pineapple cultivation the sturdy young plant serves as the weight as well, a hole being thrust through the paper stretched along the rows and the root of the plant stuck through the orfice into the soil. In this way Mr. Eckart kills two birds without one stone.

Note:—Samples of papers for mulching pineapple and sugar cane can be seen at the Fruit Products Laboratory in Montreal.

Variables in the Cooking of Sulphite Pulp*

By BENJAMIN T. LARRABEE, Cumberland Mills, Me.

It is well known that the cooking of sulphite pulp involves a number of problems of a variable nature, and that there are almost as many methods of cooking sulphite pulp as there are mills using the process. Different grades of paper require the manufacture of as many different grades of sulphite pulp, and each of these processes must be conducted in a manner to produce a grade of pulp that will be desirable for the particular kind of paper to be manufactured.

The fundamental principles of cooking are practically the same in all mills, but it is in connection with the numerous details during cooking that we find wide variations in operation. For example, one mill insists on the use of an acid that tests 6 per cent. free SO_2, another being satisfied with a 4 per cent. free SO_2. Some other mill may want 1.2 per cent. SO_2 combined, while another mill may hold that .9 to 1 per cent. SO_2 gives the best results. Some mill superintendents believe strongly in a side relief, while another superintendent will refuse to use it. There are differences of opinion as to the proper amount of pressure to use and to what maximum temperature the cook ought to be brought Some mills start to reduce the pressure on a digester at a certain stage in the cook, while others do not.

When is a Cook Completed?

I shall mention what seems to me one of the most critical problems in connection with cooking that we face, and one which involved a serious difference of opinion among sulphite engineers, and that is the determination of the complete cook.

Different methods are used in different mills to determine the blowing point of digester. Those most commonly used are color, which consists of either just simply holding a sample of the acid drawn in a glass before a light or making a comparison with a standard color; smell; testing volumetrically with a standard solution of iodine, using a starch indicator; or by drawing off a sample of stock from the digester periodically, washing it, and noting the action of bleach on it. All of these methods are in use in various mills, and each one has its ardent followers who believe that the particular method in use by them is the right one.

There are still other variables that have a more or less important bearing upon the cooking of sulphite pulp. There is the manner in which the steam enters the digester. Some mills use only one inlet for steam, usually directly at the bottom, while others use several inlets located in favorable positions so as to insure complete and thorough circulation. There are two methods of filling a digester with acid—through the top and pumping into the bottom.

Continuing Digesting After Relieving.

After a digester is brought to pressure there are several different ways observed in the operation of handling them. In one mill that I visited, as soon as a digester is at pressure the "cold gas" is relieved and the digester is then shut in for an hour, following which the relief valves are again opened and then the cook proceeded with. On inquiring why this method was used, I was told by experimentation it was found that a much better grade of pulp was produced by this method of operating. The theory as explained to me was that by shutting the digester in for an hour at that particular stage of the cook, the action of the acid at a high strength was responsible for an improvement in the grade of the pulp.

More or Less Important Variables.

It is a well known fact that the variation in moisture in the wood and the kind of wood are almost unavoidable variables which have an important bearing on the cooking of sulphite, as does also the size and uniformity of the chips. Many sulphite superintendents may wonder why I have made special mention of the foregoing variables encountered in the cooking of sulphite pulp, for to them it is a review of facts with which they are familiar. My reason for bringing them up for consideration at this time is connected with my desire to induce superintendents to get together, exchange ideas, and study carefully all problems connected with the cooking of sulphite pulp, and so lead to the standardization of the cook.

Superintendents of sulphite mills producing pulp for book paper might adopt one standard, and those producing pulp for newsprint another, and so on, according to requirements. By getting together in this manner I should expect to see most of these variations in the operation of sulphite plants reduced to a minimum, and with a consequent increase in efficiency of operation which would eventually result in the production of a better grade of pulp.

Thus far much of what I have presented has been criticism of a destructive rather than a constructive kind. With your permission I shall outline some features of operation that have a direct bearing upon the cooking of sulphite pulp used for the manufacture of book paper.

Wood Should Be Uniformly Moist.

Ordinarily the wood as received is a mixture of spruce and fir, with a varying proportion of hemlock. This wood should go to the wood room in a uniform state so far as moisture is concerned. Usually as the wood is received there is a large variation in moisture; it should be piled in the yard and allowed to season and dry out in a uniform state of moisture and be delivered to the wood room in this condition. Wood of uniform moisture would aid greatly in the production of uniform pulp. Uniform wet wood would produce equally as uniform a pulp, though dry wood would be preferable from the standpoint of strength of acid and consumption of chemicals.

If any hemlock is present it should be piled at one side, and when enough has accumulated to warrant its use it should be used by itself. This would ensure a more uniform product, for it is a known fact that hemlock should be cooked differently from fir and spruce.

Points Worth Considering.

Among minor items yet highly important, I may mention my belief that for cooking a 5/8-inch chip is desirable, and that extreme care should be taken with

*Read at New York meeting of the American Pulp and Paper Mill Superintendent's Association, July 4, 1921.

chipper knives, bed knives, chipper screens, etc., to produce as uniform a chip as possible.

Pumping the acid into the digester through the bottom has a tendency to prevent the chips from settling, and thereby brings about more complete circulation in the digester, which tends to a more uniform pulp.

I believe that a good standard strength of acid should be 6 per cent. total, 49 per cent. free, and 1.1 per cent. combined. A combined of this strength insures the use of a minimum amount of bleach, and is high enough to guard against any irregularity in the operation of the acid plant, such as a shut down or running into a bad lot of lime. It is a well known fact that when you drop the combined below .9 per cent. SO_2, you are treading on dangerous ground; the quality of the pulp is bound to be inferior and the digesters will not respond as with a stronger acid.

I believe that the steam pressure at the boilers ought to be about 150lb pressure and delivered through as small a pipe as is practicable, thereby insuring steam with a minimum amount of water. On some types of digesters there is perhaps nothing gained by having the steam enter through a number of nozzles distributed properly, but such an arrangement is desirable for the reason that complete circulation is a vital step in producing a uniform pulp.

The pressure used and the time taken to come to pressure depends upon the moisture in the wood and the kind of wood. There is certain maximum temperature which both from a commercial and economic standpoint should not be exceeded in cooking, having consideration for yield and strength of pulp; yet 300° Fahr. should not be exceeded and 290° Fahr. would be a desirable maximum.

In determining the completion of a cook it has been my experience that the color indication is indispensable; also the volumetric test with a standard solution of iodine; a combination of the two should be used to determine the blowing time.

At the beginning of this paper I endeavored to impress upon your minds some of the variables we are now facing in the cooking of sulphite pulp; next I gave you my reason for doing so and brought out the fact that superintendents should adopt standards for the cooking of sulphite pulp as well as for the other processes connected with a sulphite mill. Following this I have given my views on the cooking of sulphite pulp used for book papers, attempting to present to you conditions which, according to my knowledge of the process, are ideal.

THINK TWICE.

There recently appeared in one of our leading newspapers an article entitled "Think Twice." Under present conditions this is a mighty good motto to remember.

During the past few years Canada has been privileged to enjoy what she has never experienced before —unlimited and unbounded prosperity. The pot of gold laid at our door has been open for every one to help himself, and now the question arises, "Has it been beneficial or detrimental?" Some have profited by it financially and laid by a dollar, others have formed extravagant habits and gone into debt for many dispensable luxuries, not realizing that sooner or later the bubble must burst, and what then? not only have many allowed themselves to be misled from a pecuniary point of view, but there has been created within us a tremendous spirit of indifference. The shortage of help has forced the employer to cater to the whims and fancies of impulsive men, with a spirit that some time they would get even. If we look over the situation carefully we find two elements among the laboring class; one that has "thought twice" and the other which thought only once. It is to the latter that these few words should apply.

It was all very easy, when help was scarce, for a workman to go to the boss and say, "I want more pay; I won't do this or that," also, to stay away, and work when he pleased, etc. There was only one course for the boss to take, and that was to swallow it. But did the boss forget the men who had been true and dependable and stood by him and the concern? The answer is very easy. The first men to be let go were those who had been the most drastic in their demands, and simply because they did not "think twice."

Here is one case (which, by the way, is only one of thousands) where an employee formed a concern to pay far beyond his value. When the reaction came he was asked to make a concession, but his inability to "think twice" proved his Waterloo. The result was that after throwing up his job rather than submit to a just request, he had the pleasure of walking the streets, finally advertising "rooms to rent," that he might have a place to lay his head.

Notwithstanding that the tide has turned and the employer is in the position the employee has been for the last few years, both he and the rest of his administrative force have no right to be overbearing, and although they may have the inclination and power as men, they should "think twice." Many good men, although they have gotten in bad with the foreman, are not wholly to blame for their actions. No one knows but themselves what their true inclination was, but perhaps they could not act accordingly, owing to fear or acts of others. Such men are entitled to just consideration. I have found, as a rule, that a personal interview with such men has placed matters in an entirely different light, and what was apparently a radical and dissatisfied man was changed to a good one. This not only saved his job, but the concern is better off by having retained an experienced person.

The present is no time to create dissension, as it comes easily enough without, but it is the moment for clear thinking. We all have one right, whether employer or employe, and as a duty we owe to each other, before we take too long a step let us all "think twice" and be sure that we not only think straight but that we see and hear straight as well.—The Pulp Press.

DIRECTORY COVERS ALL NATIONS.

For paper makers and others who have occasion to deal with the industry in foreign countries, the Paper Makers Directory of All Nations, published by Dean & Son, 160a Fleet St., London, E.C. will be of the greatest assistance. The thirteenth annual edition contains 950 pages and is quoted at 21s. net. For the first time since the commencement of the war in 1914, it has been possible to completely and accurately revise German and Austria data. From the frequent references that the editor makes to this volume we can heartily recommend it to those engaged in paper and allied trades at home and abroad.

British Trade News

(From Our London Correspondent).

London, Nov. 25, 1921.

CANADIAN CHAMBER OF COMMERCE.

I have been in communication with the Secretary of the Canadian Chamber of Commerce in London, and for the information of pulp and paper men I should mention that the President is Sir George McLaren Brown, European General Manager of C.P.R.; vice-presidents, Mr. H. B. Robinson, Assistant European Manager of Massey Harris, Ltd., Lieut.-Col. W. Grant Borden, Canada Steamship Lines, Ltd.; members of council, Agent Generals for British Columbia, Nova Scotia, Ontario, Quebec, the Trade Commissioners for Canada in London, Manchester, Liverpool, Bristol and Glasgow (who are all ex-officio), Lord Beaverbrook, W. S. Hodge, (Hodge Sheriff Paper Co. Ltd.), P. Hurd, "Canadian Gazette," Walter Lefroy, Canadian Newspaper Co., R. S. Ward, The Beaverboard Co. Ltd., and several others representing steel, railways, sheet metal, flour, etc. The Chamber has a finance committee, commerce and trade committee, laws and arbitration committee, transportation, post and telegraph committee, publication and press committee, and a rooms and library committee. Mr. Hodge is on the commerce and trade committee along with Mr. Ward, while the laws and arbitration committee has the help of Mr. F. C. Wade, K.C., the Agent-General for British Columbia. The Chamber should be an extremely useful body in the United Kingdom. There is plenty of work for it and plenty of wrongs that want putting right by it. The chamber must be a live body, full of vim—and out for Canada. Mr. R. B. Stewart, the Secretary has expressed his thanks to the "Pulp and Paper Magazine," for the interest already taken in the chamber and its objects.

Technical Section.

The British Technical Section meets early next month in Manchester. To be precise it is really the Manchester Division of the Technical Section. A very enjoyable programme is being arranged and Mr. W. C. Whittaker, of Bury, Lancashire, will speak on "Suggested Improvements in the Design of Papermaking Machinery"—a subject which should be of great interest to Canadians. Mr. Nuttall's paper on "Developments on Papermaking from the Engineering Point of View," will be further discussed, to be followed by an informal talk on " Strainers and Their Difficulties" and "Vacuum Boxes." During the meeting a demonstration of the Davon Microscope will be given by Mr. T. R. Wollaston. As a kick-off to the proceedings tea will be served in the Midland Hotel. I mention this program of the Manchester Division to give Canadians some indication and an "inkling" of how the British Technical Section runs the divisional gatherings. They are interesting and instructive, I am glad to say, and members of the paper and pulp trades are becoming impressed with their importance.

The British Trade Ship.

In regard to the British Trade Ship which is to make a tour of the world I learn that provisional tenders are being obtained by the builders of the ship for the various parts and fittings. The vessel will be called "British Industry" when built and provision is being made for space for textiles, paper, machinery, and other goods which must be of the highest quality produced in the United Kingdom so that an impression will be made on buyers in the markets of foreign countries, as well as Colonial and Dominion. By this means it is hoped to build up and revive the pre-war export trade.

Anti-Noise Day.

Professor Henry Spooner has been lecturing this week in industrial circles on noise and fatigue and says that attention should be concentrated on avoidable noise. He advocates a rest day away from the noise of the machinery in the mill, which causes industrial fatigue. Workers become deaf before they reach the age of forty years in many cases, and his remedy is to supply ear stoppers and rubber for flooring, stairs, etc. The tyranny of noise, adds the Professor, materially affects workers in their production, particularly where there is high speed machinery.

Papermakers' Samples.

The papermakers of the United Kingdom have heretofore had a system of posting samples of their various makes of papers to printers, publishers, and other likely users of paper at home and abroad. By this means the name of the mill was kept and brought before prospective buyers and in many cases the samples are neatly got up so as to make them attractive looking. After the samples are sent out the salesmen go on their rounds to look for business. The Post Office has now stepped in and says the samples cannot be sent at a cheap rate, same as printed matter, and the subject has been introduced into the House of Commons by Major Wood, who has asked the Postmaster General "whether he is aware that Post Offices have refused to allow papermakers circulars to be sent at the special printed paper rates, because the circulars had printed on them 'this is a sample of our paper,' and whether he could see his way to order that such circulars were not to be treated as samples."

The Postmaster General replied that he was aware of the facts stated. Samples were not admissable at the printed rate and he could not hold that the patterns, which were described by the senders as samples were not such, nor could he alter the regulations to admit samples of paper. This means that full rates will have to be paid on samples in future—another increase in the papermakers' office expenses.

Safe Guarding Industries Act.

From enquiries I have been making recently there appears to be no one taking advantage of the Safe-Guarding Industries Act as regards paper. I am, however, open to correction. It is admitted that the importation of foreign paper into the United Kingdom is seriously affecting the sale of British, Canadian, and Newfoundland products. In the case of Finland the mills are producing paper under cost price for England. It is openly admitted they are doing so with their depreciated rate of exchange and the Finnish sellers are energetic in the British market, with a product that it would hardly pay a British mill to produce for even the sake of running machinery in order to keep it oiled. What is true of the British market is true of the U.S.A. market. To make matters worse, some of the British mills cannot find employment for their workers, orders are so scarce, yet the Finnish mills are well occupied producing paper on which they are making no profit and dumping it into the stores of the British agents. Knowing these facts, it is strange that British papermakers have not made a case for the Board of Trade under the Safe-Guarding Industries Act which has been specially introduced for them and for their protection. Let Canadians con-

sider what the position is like. Supposing the British mills turned their attention to producing paper for the sake of running machinery and shipped it to the Dominion and sold it at a price less than the Canadian mills could produce, would there be an outcry against such procedure or such an undercutting scheme—particularly if there was an Act to safeguard the producers of Canada? That is the position in England to-day. And we are told to "keep smiling"—the crisis will soon be over.

"British Paper For British Users."

Capt. Nuttall in a paper read sometime ago to the paper bag makers and the wholesale stationers said: "With prices on paper coming from countries where the exchange is depreciated, it is, of course, impossible to compete, or even to attempt such a course. We are endeavouring to deal with that problem by quite other methods, viz: the Safe-Guarding of Industries Act, and we feel sure we can count on your assistance in this respect if need be." Capt. Nuttall has got printed evidence in London to-day to stop Finland's game of tricks in the British market and there is no use of preaching "British paper for British users" until the British papermakers' by combined action and with the resources at their elbows, take up the foreign paper imports and convince the Board of Trade, with a good case, into some tangible line of action. Deeds are wanted, not words, and there is no use of adopting a policy of "Wait and See" with British mills running short time and British workers standing idle, while Finnish and German paper is cuttig the ground beneath them.

The Slump.

Capt. Nuttall has summarised the position in a nutshell in his paper. He says: When the slump came it is well-know that there was in existence tremendous stocks of all classes of wrapping and bag papers, much of it bought speculatively. Our papermakers waited patiently for those stocks to be liquidated, hoping that when they were gone, business would improve. The stocks have been largely cleared; but the improvement has not materialized. The process of clearing brought about that demoralisation in the market which was afterwards continued by the depreciated exchanges of late enemy and neutral countries. The papermaker, himself, held heavy stocks of high-priced material when the slump set in. He has in the meantime written these down in his books at ruinous loss. To-day he is fighting for business which he cannot get, although he has brought down his prices to the level of his Scandinavian competitors in most cases. It is most important also to remember that these prices entail very heavy losses, even when based on the current market prices for materials. Nevertheless, the British papermaker is prepared to suffer these losses if only he can get his plant going and keep his workpeople together. Another point to be borne in mind is that diminished output means increased cost per ton, so that the very circumstances which the papermaker is trying to overcome, namely, shortage of orders, adds to his cost of manufacture, and so to the difficulty in dealing with foreign competition. In fact, he finds himself in a vicious circle in this respect. Nevertheless, prices have been brought down to the lowest possible level—a level which is far below the cost of production, after that cost has been based upon the market prices of materials, which, in turn, are being sold below cost. I cannot too strongly emphasize that further reductions are not possible without the risk of the gravest disaster and the collapse of the industry. Very much the same conditions hold good in Scandinavia, and British and Scandinavian prices are about on the same level—in some cases British paper is offered at even lower rates. In any case the level which has been reached is the bottom level.

Life and Death Struggle.

Capt. Nuttal says the British papermakers are struggling for their very existence, it is a life and death struggle both for them and their employees. They were all groaning about taxation, he added, but the foreigner who took orders escaped scot free from it as far as this country was concerned and to the cost of foreign paper must be added the cost of unemployment doles, plus the discontent and misery of his fellow-countrymen. "After all, gentlemen," he concluded, "the mental attitude plays a larger part in these matters than we sometimes imagine, and I repeat that the difference between a determined spirit of seeking to divert foreign business to British mills wherever physically possible and a spirit of apathetic indifference means just the difference between the British mills getting going again on the one hand, and closing down on the other hand. By the need of our stricken country to-day, by the sacrifices made and being made on the part of the British papermakers, by your own enlightenment and enlightened self-interest, I appeal to you to give serious thought to this subject." In my experience I have never known a stronger appeal to be made to users of paper on behalf of the British mills. It indicates the desperate position and the prevailing conditions—caused by cheap foreign paper for which there is undoubtedly a demand, the policy being, from the buyers point of view; "The cheapest we can get; don't mind the quality."

A Hint to Canadians.

Canada sends considerable supplies of wrapping papers in the year to the United Kingdom. They are competing with the Scandinavians and the products of the British mills. At present the wrapping mills are in a poor way in the United Kingdom for the want of orders and we are told every week that the Scandinavians and other producers are practically selling at less than cost price. Canadians are thus competing in a very difficult market and it behooves them to study and constantly investigate it if a connection is to be maintained in the present day slump and depression. Products from the Dominion will be received in many cases before the foreign; but everything depends upon the price and it is the price that is being looked to nowadays. It is only a question of tiding over the present general depression and fighting down the outcry against waste and high values stimulated by the daily newspapers. They stop at nothing and between the arguments foreigners slip in with their cheap products. Canadians must realize that if the British wrapping mills are fighting for a miserable existence on prices below the cost of production, producers of the Dominion will eventually find themselves on this side of the water fighting with their backs to the wall—unless they can combat the Scandinavians, Finnish, Austrian and German mills by hitting them back with their own prices. The whole situation wants careful watching as the Finnish and German mill owners are in London appointing agents and working up business.

McINNIS HEADS BOARDS OF TRADE.

The meeting of the Temiskaming and Northern Ontario Associated Boards of Trade at Iroquois Falls on November 10th was a memorable one in several ways.

A few of the many subjects discussed will be of interest. We quote the "Broker Hustler."

A Remarkable Tribute.

When the election of officers came, Mr. McInnis was nominated for re-election by Mr. Mathewson, of Cobalt, Dr. McInnis, of Timmins, Wesley McKnight, of New Liskeard, and Mr. Lilico, of Swastika, the enthusiastic applause practically forced Mr. McInnis to accept, although he had already explained that he wished to retire; in fact, the enthusiasm over his re-election was a very great tribute to the President of the Boards. The reception was so marked that it took Mr. McInnis, practically off his feet.

The other officers elected were:—Vice-President, H. E. Mathewson, of Cobalt, Secretary, F. K. Ebbitt, of Iroquois Falls.

Timmins was chosen for the February meeting on the hearty invitation of Dayton Ostrosser and Dr. McInnis.

Co-operation with Government.

In opening the meeting, R. A. McInnis said that the Boards had advanced considerably in their organization. The Boards had to feel their way at first, but now they had got to the point where their duties and scope were much simplified. The first object of the Boards must be co-operation with the Government, the T. & N.O. Railway Commission and other bodies which could be of use to the Associated Boards. The Board was co-operating with the Government. The first essential in all the problems of the North was the decision on what was to be done. When the Boards were united on this, then was the time to approach the Government.

The Boards had made progress, slow, it was true, but it was quite satisfactory. The people of the North had established themselves in this district in a manner without precedent and unique in Ontario. Through the Boards we were now in a position to accomplish something. We needed roads and we could get them. We can get the highway.

With roads would come more intensive settlement, which brings up the question of fire prevention.

In order to get some idea of the situation in Temiskaming, a study has been made of the land suitable for agriculture, the amount of water and waste land. It shows 70 townships opened to agriculture, or 1,612,800 acres opened to agriculture, and most of this has been taken up. Twenty per cent., or 300,000 acres, has actually been cleared.

These are things which the Board should take up. Reforestation should be eliminated as long as fires occur. Every other scheme should be abandoned except that of fire prevention. The fire prevention scheme of the Government is a good one, there can be no criticism of it, but it is weak in equipment and personnel owing to insufficient grants for this end. The cost to the Government is two cents. per acre for fire prevention. That needed no comment.

H. G. Schanche reported on fire prevention, that the Advisory Committee were working in close touch with the Government. Three things necessary were more money, more authority for the district chiefs, and more educational work among the settlers.

Question of Reforestation.

Mr. McInnis dealt with the handling of slash, reforestation and the prevention of fires. He said that he had talked these matters over with Premier Drury, and that when the present busy season at Toronto, partly due to the election, was over, he had Premier Drury's promise that the whole question of forestation would be taken up. He thought the first thing that should be done in connection with fire protection was to have a big convention of farmers, lumbermen, sawmill men, pulp and paper men, to get ideas. A less dangerous way of handling the slash would have to be planned and enforced. He understood the Government would increase the restrictions on the operators. All of them would be glad to carry out the new plan provided all were forced to do it.

The first resolution from the Local Boards taken up was that by Haileybury, urging the Government to set aside a district for reforestation. Paul Cobbold said that the Haileybury Board brought in this resolution to get something started. Fire prevention and conservation were the big things of the moment. The end of the lumber supply was in sight unless immediate measures were taken to conserve what we have and provide for re-growth. The water flow also depended an the forests, so that the guarding of the forests was very essential from that point of view as well. Mr. Cobbold's motion was seconded by Mr. McAulay

Fires and their Causes.

Mr. McKnight, of Haileybury, gave a very valuable report on fires, showing that in 1920 there were 1280 fires, of which the settlers caused 11 per cent., campers 11.7 per cent., railways 23 per cent., lightning 1.1 per cent., logging 4.6 per cent., and unknown 45 per cent. H. G. Schanche impressed on the meeting the terrible enemy that fire was. Thirty-six square miles with timber running six cords to the acre would run a 230 ton paper mill for a year. If a fire destroyed thirty-six square miles it meant a loss to the Government of $11,000 in stumpage dues and a loss in investment of six and one-half millions. On this same territory the Government spent at the same time two cents an acre, or $460. Would the Government not be justified in spending more?

Mr. McInnis pointed out that in the latest Blue Book it was stated that there were three fires in thirty-six square miles or more, which covered the district outlined by Mr. Schanche.

E. G. Poole said that the question was a big one, and should not be settled too quickly or without great thought. For instance, he was himself not sure whether an acre of cleared land was worth more to the Province than an acre of spruce. The settler took a different view from the pulp and paper man.

Mr. Cobbold, again speaking to his motion, pointed out that nature alone did not reforest in the way it was best for the country, that after a fire it was chiefly birch and poplar which grew up and not spruce or coniferous trees.

No Use Planting Out Trees.

Mr. Schanche said that it had been mentioned that at Norfolk there were 1,500,000 trees ready to set out. The Abitibi had the same number of trees at Twin, but he would be the last to recommend planting out that stock while there was the present danger from fire. It was simply throwing the trees into the furnace.

Technical Section

REVIEW OF RECENT LITERATURE.

A-14. Thwing Moisture Indicator for Paper. C. B. THWING, **Technical Association Papers,** iv, 1, 47-48 (June, 1921). The strength of paper depends largely on humidity conditions; i.e., on its moisture content. The Thwing moisture indicator has been developed more particularly with a view of finding the moisture content of paper to be tested for strength, tearing resistance, etc. The moisture content of a comparison sample hanging in the same room from the arm of a graduated balance is read off directly.—A. P.-C.

C-6. Circular Saw Guard. Can. patent No. 190,319, FREDERICK SWITZER, Vancouver, B.C., Canada, May 13, 1919. The guard consists of a shield in front of the edge of the saw. The shield is supported to move laterally from in front of the saw as the work to be cut advances towards the saw. Claims allowed 3.—A. P.-C.

C-6. Guide for Band Saws. Can. patent No. 190,226, AMASA HARVEY and JOSEPH W. CAUSEY, co-inventors, both of Charleston, South Carolina, U.S.A., May 13, 1919. Claims allowed 5.—A. P.-C.

C-7. Rossing Machine. Can. patent No. 190,296, ALEXANDER McLENNAN, Campbellton, N.B., Canada, May 13, 1919. Claims allowed 5.—A. P.-C.

D-4. Grinder for Production of Woodpulp. Can. patent No. 190,343, The Union Iron Works and Harry E. Tidmarsh, assignee of a half interest, both of Bangor, Maine, U.S.A., May 13, 1919. The grinder is supplied with one scraper per pocket to remove the pulp and prevent it from passing to the next pocket and being reground. Claims allowed 5. Also patent No. 190,344. Claims allowed 3.—A. P.-C.

E-5. Cooking of Sulphite Pulp. BENJAMIN T. LARRABEE, **Paper,** xxviii, 17 (June 29, 1921). A plea for general cooperation among superintendents for the study of all problems connected with the cooking of sulphite pulp and other processes connected with a sulphite mill, to bring about standardization of the cooking of sulphite pulp, as far as possible.—A. P.-C.

F-2. Constituents of Colophony and Sulphate Black Liquor. O. ASCHAN, **Ber.,** xlv, 867-886 (1921); **J. Soc. Chem. Ind.,** xl, 493a (June 30, 1921).—A new series of acids has been isolated from the residues left after the preparation of pinabietic acid from sulphate black liquor and also from American and from Finnish colophony. These are provisionally termed colophenic acids. They are monobasic acids which are differentiated from the resin acids by the ready solubility of their sodium salts in cold water and the stability of the solutions toward carbon dioxide.—A. P.-C.

H-1. Rapid Determination of Available Chlorine. MORRIS SCHRERO, **J. Ind. & Eng. Chem.,** xiii, 559-580 (June, 1921); **Paper,** Aug. 17, 1921; **Pulp and Paper,** xix, 1095 (Oct. 27, 1921). The method depends on the pressure exerted by the oxygen liberated by the action of hydrogen peroxide on hypochlorites in alkaline solution, according to the equation $CaOCl_2 + H_2O = CaCl_2 + H_2O + O_2$. The apparatus consists of two bulbs connected by means of a stopcock and a by-pass. The upper bulb has a neck which allows the apparatus to be clamped, and the lower bulb has an opening attached to it at an angle of 45 degrees. A manometer tube is fitted into a rubber stopper and to this tube is attached a sliding scale graduated to read in pounds of 35 percent bleach per gallon of liquor. A sketch is given showing the most convenient dimensions for liquor containing about 0.5 pound per gallon. The results obtained by this method do not vary more than 0.02 pound of 35% bleach per gallon of liquor from those obtained by titration with sodium thiosulphate, and if all necessary corrections were made it would probably be fully as accurate as some of our present laboratory methods. The apparatus can also be used for the analysis of permanganate, peroxides, perborates, carbonates, etc.—A. P.-C.

K-6. Process for Decolorizing Waste Paper. Fr. patent No. 518,596, WILHELM ABELE, Germany. **Papeterie,** xliii (June 10, 1921). Hot liquor (the nature of the liquor is not given) is forced through the mass of waste paper, eliminating the color and impurities and causing the paper to swell up.—A. P.-C.

K-7. Improvement to Disk Refiners. Fr. patent No. 517, 728, "Union des Papeteries," Belgium. **Papeterie,** xliii (June 10, 1921). The weight of the upper and middle disks is counterbalanced by suitable weights, the positions of which are adjustable along lever arms, so that the pressure exerted may be accurately adjusted.—A. P.-C.

K-8; K-12. Process for Coloring Paper in the Web. Can. patent No. 190,690, WILLIAM D. HARPER, New York, N. Y., U.S.A., June 3, 1919. A design in color, which does not spread or run, is applied to one surface of a moist web of paper while the latter is travelling during the process of manufacture, without compressing the web or disarranging the fibers in it, the color design penetrating the web to the depth required to produce itself in sharp and even outline on the other surface of the web. Claims allowed 2.—A. P.-C.

K-12. Process and Apparatus for Drying Paper. Fr. patent No. 516,178, OGDEN MINTON, U.S.A. **Papeterie,** xliii (June 10, 1921). Same as Can. patent No. 205,660, November 16, 1920.—A. P.-C.

K-12. Rubber Rolls. R. B. ADAMS, **Paper,** xxviii, 17 (June 29, 1921). Brief outline of the history and development of the rubber roll business, with a description of their methods of manufacture, characteristics, and "diseases."—A. P.-C.

K-12. Paper Machine Drives. W. W. CRONKHITE, **Paper,** xxviii, 17 (June 29, 1921). Brief discussion of the requirements of a paper sectional motor drive for paper machines and of the merits of the General Electric sectional motor drive.—A. P.-C.

K-12. Fourdrinier Machine. Can. patent No. 190,660, WILLIAM MURRAY and CHARLES E. PUTMAN, co-inventors, both of Chisholm, Me., U.S.A., June 3, 1919. The suction boxes are given a reciprocating movement in the direction of movement of the paper machine wire. Claims allowed 5. (Cf. Fr. patent No. 488,907, William Alex. Aitken, England. **Pulp and Paper,** xvii, April 3, 1919).—A. P.-C.

K-23. Apparatus for Manufacture of Electric Insulating Material from Paper Web.—Can. patent No. 190,264, EMIL HAEFELY, Basel, Switzerland, May 13, 1919. The Web is passed through a receptacle containing a powdered agglutinant and is then heated to melt the agglutinant on the web. Claims allowed 8.—A. P.-C.

K-23. Reinforced Paper Strip for Box Corners, etc.—Can. patent No. 190,270, PATRICK TRACY JACKSON, Cambridge, Mass., U.S.A., May 13, 1919. As an article of manufacture, a reinforced or strengthened fabric comprising two plies which is normally dry but rendered adhesive on moistening it, an adhesive layer between the plies of paper, and a series of closely adjacent strengthening unspun fibers between the plies which are secured to them by means of the layer of adhesive. The lengths of the strengthening fibers are parallel to the cross-machine direction of the paper. Claims allowed 5.—A. P.-C.

K-23. Watermarking Handmade Paper. DARD HUNTER, **Paper,** xxviii, 17 (June 29, 1921).—A description of the method of making watermarks (ordinary, shaded, and colored) in handmade papers.—A. P.-C.

K-0. Standardization of Paper. W. HOWARD HAZELL, **Paper,** xxviii, 17, (June 29, 1921). A plea for the adoption of international standardization of unit of sale (recommends the "mille"=1,000 sheets) thickness, methods of packing, customs of the trade, and sizes.—A. P.-C.

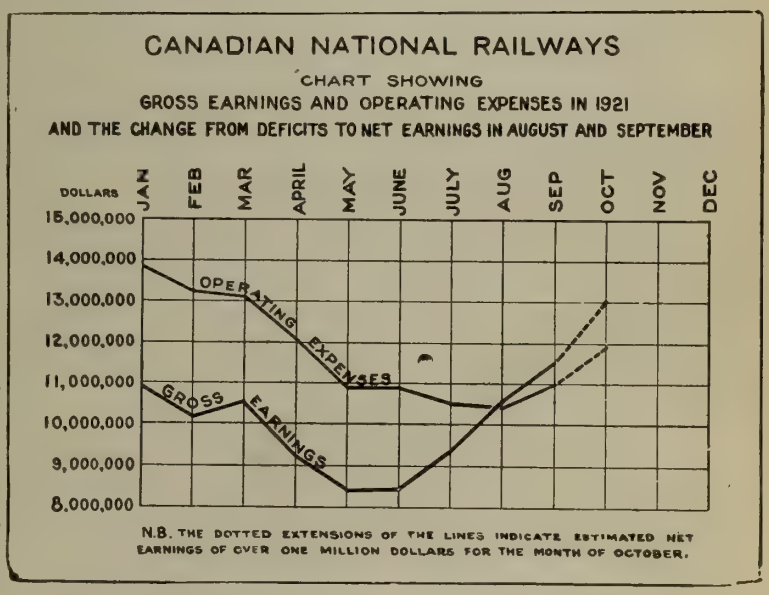
L-5. Softening of Vulcanized Fiber. Can. patent No. 190,346, Aktieselskapet Vulkanlaer-Industri, assignee of Thomas Cye, both of Christiania, Norway, May 13, 1919. Plates of hard vulcanized fibers are rendered flexible and supple by placing in a bath of water, impregnating the plates with a mixture of water and oils miscible with water, and finally exposing the plates to the action of a solution of calcium chloride in water. Claim allowed 1.—A. P.-C.

M-12. Paper Mill Lubrication. T. C. PORTEUS, **Paper,** xxviii, 17, 14-15, 30 (June 29, 1921). A discussion of the advantages of using greases for lubricating paper machinery.—A. P.-C.

O-3. Purification of Boiler Feed Water. F. BLUMENTHAL, **Z. angew. Chem.,** xxxiv, 189-192 (1921); **J. Soc. Chem. Ind.,** xl, **446a** (June 30, 1921). A detailed review of the lime-soda, baryta, permutit, and Neckar processes for softening boiler feed water. The lime-soda process can only reduce the hardness to a limit of 2 or 3 degrees on account of the solubility of calcium and magnesium carbonates, and in addition soluble sodium salts and about 10 to 15 Gm. of sodium hydroxide per cu. m. are left in the water and pass into the boilers, which must therefore be blown out periodically. In the baryta and permutit processes, on the other hand, smaller amounts of soluble salts are left in the feed water. In the Neckar process, heating the feed water to 80° Cent. cannot cause the precipitation of the calcium and magnesium carbonates; such precipitation must be caused solely by the alkalinity of the boiler water which is returned to the purifier. Moreover, the statement that in this process the carbonic acid is entirely precipitated is quite incorrect, since it is all converted in the purifier into sodium bicarbonate, is fed into the boiler, and is there expelled with the steam, the residual normal carbonate being returned to the purifier, and the above operation repeated. Magnesium salts are completely precipitated only when sufficient sodium hydroxide is formed in the boiler by hydrolysis of the carbonate unless additional hydroxide is supplied to the purifier, which materially increases the cost of the process.—A. P.-C.

R-11. Technical Control at the Brompton Pulp and Paper Company. A. B. COPPING, **Pulp and Paper,** xix (June 23, 30; July 7, 1921). Notes on investigations of the technical service department at the East Angus mill at the Brompton Pulp and Paper Company, May to September, 1920.—A. P.-C.

K-18. Improvement to Calender Guards. Fr. patent No. 515,566, MIKE TELEZKY, U.S.A., Nov. 27, 1920. **Papier,** xxiv (May, 1921); **Papeterie,** xliii (May 10, 1921); **Monit.** Papeterie Francaise, lii (June 15, 1921). Same as English patent No. 131,616. See **Pulp and Paper, xviii** (April 29, 1920).—A. P.-C.



Canada, whether certain individuals approve or not, is the owner of 22,000 miles of railways together with all the rolling stock and equipment necessary to operate the same. This gigantic plant can be rapidly and permanently changed from a losing to a paying venture, if and when the Canadian people decide that they will give their own railroad a fair and equitable share of the existing passenger and freight traffic of the country.

Eastern people, as a rule, do not know what "hauling to market" means. Many western farmers, located miles from a railway, start out at dawn to draw a load of grain to an elevator. Arriving in town after dark, they have to board themselves and their team for the night at some expense. Next morning they deliver their grain to the elevator, do some necessary shopping and arrive back home after dark again—having been on the road some 36 hours. The construction of the Canadian National Railways was a tremendous boon to thousands of such farmers, by bringing shipping facilities much closer to their farms—literally cutting down the time necessary to deliver a load of grain from days to hours.

SULPHITE DIGESTERS

Digesters used for cooking wood chips in the sulphite process of making paper pulp are usually cylindrical vessels, with conical tops and bottoms. A common size that has been adopted by many companies is a diameter of 15 feet wth the overall height ranging from 30 feet to 45 feet, depending upon the capacity desired. Many factors enter into the proper construction of a sulphite digester.

First. Such materials must be used that will resist the chemicals of the cooking process.

Second. It must be strong enough to withstand the high steam pressure to which it will be subjected during the cooking period.

Third. It must be able to withstand the unusual strains and stresses caused by alternate filling and emptying of the digester and by the extreme changes of temperature.

In order that the digester will have the desired strength it is customary to make the shell from plates varying from 1 to 1¼ inches thick, with very carefully designed high-efficiency butt strap joints, using rivets 1⅛ or 1¼ inches in diameter. In detailing these high efficiency joints, care must be taken to see that there is very little variation from the theoretical pitch, inasmuch as only a small variation will materially reduce the efficiency of the joint. The integrity of the manufacturer must be relied upon to insure that this precaution is taken. In fabricating the digester shell, care must be exercised to see that the material around the rivet holes is not injured. Usually the holes are "drilled from the solid" ⅛ inch smaller than the nominal size of the rivet and then reamed to 1/16 inches larger than nominal after the plates have been assembled in the shop. The assembled plates must be carefully matchmarked in order that they can be assembled in the field in exactly the same order they were in when the rivet holes were reamed in the shop.

Digester Linings

The great problem in the development of the digesters for the sulphite process has been in finding of a suitable lining for the vessel. Ideal conditions would result from having a lining with exactly the same coefficient of expansion as the steel shell. This lining must be of such material that it would not be affected by the chemicals. Up to the present time such a lining has not been found. At the present time the usual type of lining is one made with acid-proof bricks separated from the shell by a layer of Portland cement and set in a jointing of litharge, quartz and glycerin. For a long time it has been the practice to calculate the stresses in a digester by means of conventional formulae for cylindrical pressure vessels without any consideration of the action of the masonry lining.

Prof. A. P. Mills and H. O. Keay made a series of tests several years ago at the plants of the Laurentide Company, Ltd., and the International Paper Company to see just what influence the expansion of the lining would have. Their series of tests extended over a period of some ten months and they found that at the end of this time they had an accumulation of residual stresses in the digester shells of between five and six thousand pounds per square inch, caused by the expansion of the lining during the operation. Further experiments are being carried on at this time by various interested companies to determine, if possible, a lining that will neither shrink in setting nor will expand during operation to such an extent that it will impose undesirable stresses in the shell.—The Water Tower.

BRITISH INDUSTRIES FAIR.

F. W. FIELD.

The eighth annual British Industries Fair which em-

world's [illegible] any other trade fair or similar purpose. A visit to the Fair will convince overseas buyers that enormous strides have been made in Britain's post war production. A considerable number of Canadian buyers are making arrangements to attend. Admittance is restricted to trade buyers on invitation of the British Government and business is not impeded by crowds of sightseers.

While participation in the Fair is confined to manufacturers in the British Empire exhibitors, many overseas buyers will undoubtedly continue to utilize the services of merchant houses who fill so important a role in the export trade of the United Kingdom. From the buyer's point of view, however, the Fair has the great advantage of personal contact with the actual producer.

In organizing the Fair, the British Government Department of Overseas Trade pays particular attention to the comfort and convenience of buyers from the various Dominions and other parts of the world Special reading and writing rooms are available where buyers may consult qualified officers of the Department who will be able to indicate sources of supply of any goods required and to give information regarding tariffs, shipping and transport, trade conditions, etc., throughout the world. The catalogue of the Fair is a mine of information for it is not merely a list of exhibitors but a book of trade references of great value.

The London Section of the Fair will, as in 1921, be housed in the White City, a large group of exhibition buildings within a few minutes of the centre of London, and connected with every part of the London area by trains, omnibuses and street cars, while the Birmingham Section will again be in the great buildings of the Castle Bromwich Aerodrome, which may now be regarded as permanent Exhibition buildings, within easy reach of the centre of the city. There is a floor area of more than 1,130,000 square feet which is admirably suited for the purpose, and it is interesting to note that the gangways between the stalls total no less than 3½ miles in length. Not only are both sections of the Fair in London and Birmingham in each instance under one roof, but the various trades are grouped in separate but adjoining buildings, thus saving the time of the buyer who will find side by side with well-known firms, businesses of which he has probably never heard, but which are of equal interest.

The British Trade Commissioners in Canada will be pleased to give full particulars and to issue invitation cards to Canadian buyers who propose to visit the Fair at their following addresses:—

248 St. James Street, Montreal.
260 Confederation Life Building, Toronto.
610 Electric Railway Chambers, Winnipeg.

PULP AND PAPER NEWS

The Riordon "tax-evasion" issue, as the Liberals term the Government's omission to collect the taxes due from the Riordon Company, Ltd., has assumed the proportions of a big factor in the election campaign just concluded. In Ontario, during the latter part of the campaign, scarcely a meeting was held at which the matter was not referred to at considerable length, and, on the whole, audiences were obviously impressed with the anti-Government side of the question. Of course, Conservatives claimed that, in not enforcing payment of the taxes when due, the Government acted with humanity, and that, moreover, it had seen to it that it was fully secured. But the Liberals adopted a line which countered this argument very effectively. One man told Sir Henry Drayton, the Minister of Finance, that he invested $3,000 in Riordon in 1920 when the Minister of Finance knew the financial situation of the Company, but the general public did not. "Do you think," he said, "I would have invested one penny if I had known the state of their finances? That is what the late Government has done for hundreds of investors in Canada." This aspect of the matter undoubtedly produced a deep impression which Mr. Meighen could not remove by his assertions that Mr. Carl Riordon was a supporter of the Liberal party. As regards the latter, whether he is a Liberal supporter or not, he has been personally attacked with the utmost vigor from Liberal platforms in Ontario.

Considerable interest is evinced in the notification that a large pulp and paper mill is to be erected for the British Columbia Government at Prince George, B.C. It is understood that it will represent an investment of some $7,000,000 and that when completed, it be one of the largest pulp and paper mills on the continent.

The Bulletin of the Imperial Institute gives a comprehensive account of the giant grasses, found in tropical and sub-tropical countries, which, many of them, are said to give a satisfactory yield of pulp which produces good paper. Up to the present time, such countries have relied mostly on the forests of the northern temperate regions for their supplies of paper-making materials. For example, wood pulp. produced from spruce and other timbers in Canada, the United States and Norway and Sweden, is imported into India and Australia for the manufacture of the cheaper kinds of paper, while other of such countries, such as tropical Africa, for instance, where manufacturing industries are, as yet, in a comparatively elementary stage, import practically all their paper ready-made. It now appears, however, that, in nearly all such countries, there are native products, of the nature of giant grasses, which can be used for paper-making, and, in some them, a survey of their natural resources of this kind is being undertaken. In India, bamboos appear to be the most promising source of paper-pulp, but in other countries huge grasses, many of them very similar to bamboos in appearance, and which, it is apprehended, can be used for the same purpose, exist over large tracts of land. In eastern tropical Africa, a species of giant grass, known as Elephant grass, is found, and this material has not only been subjected to comprehensive and exhaustive tests, but it has also been used for the printing of Government paper, of excellent quality, in Uganda. While grasses of this kind could not, owing to their bulk, be profitably exported, it looks as though, in the countries to which they are indigenous, an extensive use may be made of them for paper-making and also for conversion into pulp for export.

As is notorious, lumber production in Canada, this year, has been on a very much smaller scale than usual. The amount of business being done in lumber at the present is very limited, indeed. For the most part, retail yards are ordering only for necessities as they arise, and are not attempting to cater to a probable future demand. Building construction, which, owing to trouble over the high cost of both materials and labor, at no time attained anything like adequate proportions, is now rapidly slowing down everywhere. Buyers are probably holding back, and, while there may be no immediate shortage, wholesalers incline to think that this will develop in the future. Once the buying practice begins, it will probably spread quickly. At the moment the downward movement of prices has now reached a point at which producers of lumber are constrained, so they claim, to take a loss on all that is logged at the present market level. But, once buying begins, a shortage is quite likely to become speedily apparent. For the light production of the present season—a production only from twenty-five to thirty-five per cent of normal—will not add sensibly to stocks of dry timber. The British market for Canadian hardwoods is stated to be improving.

A charter has recently been granted to the United Paper Company, Ltd., of Quebec City, to deal and trade in paper, and to manufacture and sell paper boxes, roofing papers, twine, etc.

The Wilson-Munroe Company, Ltd., of 106-108 York Street, Toronto, will be located in its new premises, 18 to 20 Duncan Street, Toronto, as from the first day of the New Year. The Company is to be heartily congratulated on these new premises which are both very commodious and very commercially situated. Further than that, they not only present a highly attractive appearance, but they afford complete and up-to-date facilities for the handling, under exceptionally favorable circumstances, of the requirements of the Company's large and constantly increasing clientele. For some time, the Wilson-Munroe Company, with its business, both in scope and in volume, continually extending, has felt itself handicapped by considerations of space. In the location on Duncan street, to which it is moving on the 1st of January, it will be subject to no such disabilities. The large building which it has purchased consists of three floors in addition to the basement. It will afford ample space for the thriving business of which it will constitute the scene of operations. It will enable the Company to carry larger and more varied stocks and to extend its policy of "broad-

ening out'' in a way that will be not only in consonance with the progressive spirit of the organization itself, but will also be, in the highest degree, satisfactory to its many customers. Altogether the Company will now find itself in first-rate shape.

The directors of the Spanish River Mills last week held a meeting in Montreal. Those present included Messrs. G. H. Mead, president, P. B. Wilson, vice-president, G. Gray, and C. H. L. Jones.

Mr. T. P. Howard, controller of the Howard Smith Paper Mills, Limited, Montreal is recovering from an attack of pneumonia.

A card just received from Wm. Whyte in Christiana, says he has had an excellent business trip and will be back in Montreal by Dec. 18. The picture shows Norway's capital, a very beautiful city.

A report from Victoria, B.C., states that the American freighter, Robin Goodfellow, completed her cargo, viz: loading 2,000 tons of pulp at the Whalen Pulp and Paper mills plant at Port Alice.

ANNUAL MEETING C.P. & P.A. IN MONTREAL.

At a meeting of the officers of the Canadian Pulp and Paper Association it was decided to hold the annual meetings during the week of January 23. Arrangements are now being made for the annual meeting of the general association on Friday, January 27, at the Ritz-Carlton Hotel, Montreal, to be preceded by meetings of the different sections on Wednesday and Thursday, January 25 and 26. The Woodlands section will hold its meeting on Wednesday, January 25, at the Windsor Hotel, Montreal.

An unusually interesting series of problems affecting the technical side of papermaking are expected to have a place on the agenda of the technical sections.

At the Woodlands section meeting it is proposed to centre discussion upon the question of the adoption of a permanent practical forestry policy, by the respective Provincial Governments. Mr. G. C. Piche, chief forester of the Province of Quebec, will give a more or less, exhaustive report on his observations of technical forestry made during his trip to Europe during last summer. This address will have particular reference to the applicability of European methods to the province of Quebec. As the subject of forest conservation is coming more and more to the front, it is expected that Mr. Piche's address will lead to a full and instructive discussion.

Up to the present it has been the custom for the incoming President to preside at the festivities in connection with the annual meeting of the Association. In January a change will be made, and the festivities will be presided over by the retiring President.

BIG MARKET LIKELY FOR B.C. PULP INDUSTRY.

Things are looking bright for the pulp industry of B.C., says a despatch. Two new markets are gradually opening up. Mexico and Japan are both in the field with demands for this product. Japan wants a great deal for paper making, which is becoming a great factor in Nipponese commerce, and Mexico has announced that a ready market is opening there. Japanese exporters on the coast say the demand will be greater than ever in 1922, and expect a heavy call to supply new mills that are opening up in Japan.

PULP SHIPS RETARDED BY ICE.

The importance of having adequate ice-breaker service on the St. Lawrence so far as the pulp industry is concerned, is reflected in the fact that there have been difficulties with the clearance of two vessels on the Saguenay, which had been scheduled to load in the closing days of last week. This means that there would have been half a million dollars' worth of exports out of this Province had there been available in the closing days of the season a powerful ice-breaker for service around the mouth of, and on, the Saguenay.

It was stated yesterday by Mr. A. M. Irvine, a director of Becker & Company, of America, Montreal office, that this season fifteen vessels have been cleared with pulp cargoes for European and United States ports from Saguenay; but owing to the lack of ice-breaker service two vessels over and above this number bound for the Saguenay were involved with ice difficulties. One of them, which arrived after the ice had formed, was compelled to proceed elsewhere, this being on Friday last. In the other case, realizing the necessity of getting the vessel out, communication was opened with the Department of Marine and Fisheries, whereupon the Deputy Minister of Marine and Fisheries despatched the Government ice-breaker Montcalm to the spot, though this was only possible owing to the fact that the Montcalm happened to be available at the moment. At this season, however, it frequently happens that these two vessels, the Montcalm and the Lady Grey, are busy with special duty, such as picking up buoys and calls from other sections of the river. In this case, however, the Montcalm was able to go to the relief of the Domira, one of the steamers of the Preston Steam Navigation Company, and it passed outward on Friday last. The second vessel had to be diverted elsewhere.

It is quite evident, argued Mr. Irvine, that if the ice-breaker could have been at the disposal of shipping in the lower St. Lawrence for the closing days of this season, that Canada would have benefitted to the extent of a million or more dollars' worth of exports this season.

SISSIBOO PULP MILLS RESUME.

The Sissiboo Pulp & Power Company's mill at Weymouth Mills, N.S., have resumed operations. Arthur Hatt is superintendent. The mill has been closed for about five months, during which time many repairs were made and more machinery installed.

The Pulp Company expect to have the new railway spur in operation in the near future.

Mr. George R. Naden, Deputy Minister of Lands for British Columbia, has just made a week's inspection trip in the timber involved in the proposals for a pulp mill at Prince George, B.C. Mr. Naden was necessarily non-committal with respect to what the Minister, Hon. Mr. Pattullo, might decide, but hoped for a successful and satisfactory statement.

"Start to-day and make Safety part of your work," says the Safety League.

UNITED STATES NOTES

An indication of the rapid growth of the wood pulp and paper manufacturing industry in the South is shown in a report recently completed by the Forest Service of the United States Government. Comparing figures of 1920 with 1916, the report shows an increase of almost 100 per cent. There were eleven mils operating in the Southern States during 1920 and production amounted to 144,604 tons of wood pulp, as compared with only 87,339 tons in 1916.

A national campaign of education to emphasize the necessity of a reforestation program will be one of the immediate results of the hearings of the forestry policy committee of the United States Chamber of Commerce which were recently concluded in New Orleans. Resolutions endorsing the work of the forestry policy committee and expressing appreciation of leading lumbermen of the south and the Louisiana Department of Conservation featured the final hearings.

Members of the committee mentioned in the foregoing item, were the guests of honor at a dinner tendered them last week in the Pine Tree Inn at Bogalusa, La. W. H. Sullivan, Mayor of Bogalusa, La., who presided, announced that plans have been completed for the erection at Bogalusa of a new paper mill, the exact duplicate of the present one, and employing approximately the same number of men. An outlay of more than one million dollars will be required for the new project, declared Mr. Sullivan. The members of the committee and lumbermen from many parts of the country were taken on a tour of inspection through Dixie Ranch, near Slidell, where they viewed the thousands of acres of second-growth pines now ready for the pulp mill. Escorted by the Bogalusa Chamber of Commerce, the committee also visited the timber lands of the Great Southern Lumber Company, viewing the reforestation work being carried on there. The visitors commented favorably on the Salmen holdings at Slidell as a fine example of what can be done throughout the country.

New York service houses of the American Writing Paper Company gave last week in the United Publishing Corporation Building, 239 West 39th Street, New York City, an educational exhibit of paper-making. The show, which was free to the public, included visible demonstrations, showing processes of rag-sorting, beating, bleaching, water-marking, deckling and loft-drying. Envelope machines were shown in actual operation, and there was a paper-testing laboratory with equipment as complete as any in the world. This laboratory ensemble, staged by the American Writing Paper Company, was in charge of Miss Helen U. Keily, an expert chemist and head of the company's department of technical control. The envelope-making exhibit is that of the United States Envelope Company, Holyoke, Mass. The envelope machine is of the most modern type and has a capacity of six to ten thousand an hour, depending on the style or size of the envelope. In contrast with the up to date machinery was an early prototype brought to New York for the exhibition from the United States Envelope Company's historical museum at Worcester, Mass. Among the exhibits of greatest interest to the casual visitor was a wonderful little paper-making machine, said to be the smallest of its kind in the world, it was shown in operation, turning out a tiny sheet of paper 4 inches wide, at the rate of 3 feet a minute.

Philip T. Dodge, president of the International Paper Company, tendered a dinner last Thursday at the Lotos Club, New York City, to Mark Sheldon, Australian Commissioner to the United States, who sailed for home on Saturday.

President H. S. Zellerbach, of the Zellerbach Paper Company, San Francisco, is travelling through the East, making a study of the model paper distribution houses.

Modern Pulp and Paper Making, by G. S. Witham, Sr., has been published through the book department of the Chemical Paper Company. Mr. Witham's treatise, while a rather bulky one, might well serve as a sort of handbook of value to those engaged in the pulp and paper making industry and to those contemplating entering it. It is a book of sober practical purpose and technical detail that describes processes, the machinery by which they are carried on, and the methods of the business. The volume is copiously illustrated and it contains many diagrams and pages of useful data. (See Advertisement, page).

The Williams C. Jones Company, which operates one of the model envelope plants in New York City, reports that it has had a capacity business during the year. The concern has had to move to new quarters recently where its floor space has been doubled, so that it now occupies 16,000 square feet. This plant, replete with every modern machine used in expediting envelope manufacture, has a capacity of 500,000 envelopes a day, but it is being crowded to the limit by the rush of business, according to one of its officials. While many envelope manufacturers were reporting trade as being dull, the Jones Company claimed that its plant was kept going night and day throughout the depression of the past year.

A charter under the laws of Delaware has been granted to T. L. Crateau, M. A. Bruce and C. H. Maxwell, all of Wilmington, Del. as incorporators of the Nashville Pulp and Paper Company, which, with a capitalization of $1,200,000, will engage in the manufacture of paper, dealing in pulp, etc at Nashville, Tenn.

An announcement has been sent out by Parsons & Whittemore, New York City, informing newsprint consumers and buyers that the Finnish Paper Mill Association has appointed the Parsons & Whittemore Co., exclusive agent for Finnish newsprint imported into the United States. Prospective buyers are urged to send in their specifications early due to the limited tonnage available for the year 1922. It is stated that shipments may commence in January, and that the price at present is 3¼ cents per pound c.i.f. Atlantic ports.

According to a report compiled by the Woodlands sections of the American Paper and Pulp Association in co-operation with the United States Forest Service, forest fires in the pulpwood regions of the United States during 1920 numbered 14,463, burning over 2,059,408 acres. The total damage by these fires throughout the country was $6,319,641.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 3rd Dec.—By the time that these lines are in print, the Dominion election will be a thing of the past; and it will be possible for the pulp and paper industry to take a survey of the situation as modified by the calling into being of a new House of Commons, and gain some general idea of how far it is likely that either hopes or fears may be justified. However the election goes, this much of good must issue from it: that it will end uncertainty. For uncertainty in the political world almost invariably spells unsettled conditions in the industrial field. Although the election campaign unquestionably resulted in an increased demand for certain lines of paper, it may yet well be doubted whether the direct good, which it achieved in this direction was not more than counterbalanced indirectly by the business unsettlement which a campaign so protracted as that which we have recently experienced, unquestionably tends to foster and to accentuate. At the same time, the pulp and paper industry, as a whole, has certainly not been affected to the same extent as have certain other industries, which occur to one's mind very readily, by that disturbance of business conditions for which, in greater or less degree, a general election is always responsible. Trade generally has been pretty good in the last week in the industry. Business continues to be marked by a gratifying steadiness, although a somewhat more appreciable degree of quietness than had been expected characterized some lines, and perhaps, too, the expansion of scale of purchasing operations which had been anticipated has not quite come up to expectations. However, informed opinion to the effect that, looking at the situation as a whole, things are on the up grade, remains unchanged. The chief handicap to the industry is that general business conditions are not picking up as it had been expected that they would. Of course, there are exceptions. For example, in certain lines of textiles there is genuine activity—largely seasonal—just now. But some industries are almost dormant. Talking this week with four very prominent manufacturers—and in widely different branches of industry—the writer was certainly impressed with the fact that none of them took a very roseate view of the likelihood of general business revival on a scale of real magnitude in the near future. "Optimism" said one of them, summing up the matter, "is the right spirit for business, and optimistic talk stimulates business provided it is reasoned. But how can I talk optimistically when I am ready to take orders without making any profit, simply to keep my organization over the winter, and yet have combed the Dominions for such orders and without success?" It is that kind of situation which results in buying being still on a limited scale in the paper industry, though it must be added, on the other hand, that there is, in the aggregate, a great deal of it. Prices, on the whole, continue firm, and one is told, with pretty general unanimity, that the tendency is to mount rather than to drop.

PULPWOOD.—The pulpwood market is looking up somewhat. If next year is a busy one in the pulp and paper industry, then pulpwood dealers will find a market for their present stocks of pulpwood at considerably enhanced prices, particularly in view of the fact that so little is being cut this winter. Should a real buying movement commence, they will find themselves "in clover."

NEWSPRINT—The pulpwood for newsprint still keeps up. In spite of the fact that there is a good deal of unemployment, newspaper circulations are on the increase. This is due to the drive for increased circulations in whch some Ontario papers are engaging. There one finds one paper giving away some household requirement as a sort of premium to subscribers, while another promises to donate bicycles to lads who will will get it subscribers. There is a good deal of talk of the starting of additional newspapers—one of them is to be in Toronto. All this sort of thing means an increased demand for newsprint. Unless absolutely destitute, people buy newspapers, unemployment not withstanding. In addition, during the election campaign many of the newspapers increased the size of their editions. Altogether, the newsprint branch of the industry has been characterized by much activity.

BOXBOARD—The boxboard plants are running full. The price on many lines was recently jacked up, and, as often happens, this seems to have had the effect of stimulating, rather than abating the demand.

BOOK PAPER.—Just now the book paper business is noticeably good. The consumption is showing a decided increase, due, no doubt, to the fact that many commercial firms are giving orders for a good deal of printing in the way of catalogues and other commercial literature.

WRAPPING PAPERS.—The demand for wrapping papers continues to expand, as is natural at this season of the year. In its kraft aspect, particularly, the situation looks favorable.

TOILETS AND TISSUES.—Even when things were looking at their worst in the industry generally, one found a very high degree of confidence manifested by the manufacturers of toilets and tissues. Indeed, the head of one such concern gave accounts, from time to time, right through the dullest period, of operations at his mills, to the writer, which were, relatively speaking, of a satisfactory nature. Today these concerns are experiencing a rush of business, and, as much of it is of the "hurry up" kind, some difficulty in giving delivery at the moment required is being encountered. And not only is business good at present, but prospects ahead are indubitably bright.

RAGS AND WASTE PAPERS.—The improvement in the demand for rags and waste papers continues to develop. Not so very long ago the market was absolutely dead. But now prices have advanced in several lines owing to scarcity in supply and the outlook altogether shows marked improvement..

The Outlook in Montreal.

Montreal, December 6.—Inquiries in all sections of the pulp and paper market indicate that business is generally satisfactory, and that prices are being maintained. Trade is slowly recovering, and there is a feeling of confidence that at one time was sadly

lacking. It takes a considerable period to fully restore that feeling, but a spirit of optimism is abroad, founded on a belief that the industry is on a sure foundation. In one or two sections orders are none too plentiful, while in others the mills are on full time, with good business in sight.

PULP. — The demand for bleached sulphite is fairly good, prices holding firm in keeping with the recent advances by U.S. mills. Ground wood is not particularly brisk, the price being about $26 at the mill. Kraft commands $62 at the mill. with a moderate demand.

NEWSPRINT. The recent reduction by the Canadian Export Paper Company to $75 and the report that the International Paper Company will go one better and cut the price to $70 have been the prominent features in this section. The. report referred to was not welcome news, and was reflected in the price of the paper stocks. It had been unexpected, especially as it was understood that the International had no intention of entering upon a price-cutting policy, which will be of no benefit either to American or Canadian mills. The fact that the companies have still large stocks of pulpwood bought at high prices is an argument against the initiation of such a policy. It may be taken for granted that if the report is confirmed Canadian mills will meet the competition.

BOOK AND WRITING PAPERS.—The market is good. Orders are coming in satisfactorily, and the outlook is promising.

FINE PAPERS.—On the whole, business is fair, having been stimulated by the lower range of values.

BOARDS.—After a period of briskness, there is a lull in the orders, due to the taking of inventories. It is expected, however, that trade will again pick up by the middle of January.

WRAPPING PAPERS.—There is a good demand with a tendency for prices to stiffen a little.

ROOFING PAPERS.—Not a great deal of business is passing, due to the fact that the building season is practically over, and that the principal purchasers from manufacturers are not inclined to commit themselves for the present.

RAGS AND WASTE PAPER.—Rags for paper making are in fair request. There are many inquiries for waste paper, but the supply is limited and not equal to the demand.

TISSUES AND TOILETS.—The trade has been very brisk, but is now quieter.

NEW YORK MARKETS.

New York, December 3.—(Special Correspondence) —Reports going the rounds of the local paper trade are to the effect that leading domestic manufacturers intend to cut prices on newsprint for the first quarter of the new year to $70 per ton f.o.b. mills, representing a decline of $10 per ton or half a cent per pound from the rate prevailing during the final three months of this year. No definite announcements have been made as yet, but it is generally accepted as a foregone conclusion in paper circles that $70 will be the contract basis fixed for next January, February and March deliveries. Ever since a cut of $5 a ton to $75 was announced several weeks ago by Canadian producers, the trade here has been waiting for domestic manufacturers to follow suit, and indications are that American producers plan to outdo their fellow-manufacturers across the border by cutting prices twice as deep as the latter. It is felt here that if manufacturers in this country fix a price of $70 per ton that Canadian producers will readjust their prices to the same basis, and that this figure will be the ruling quotations in both countries over the next quarter.

Of course all attention locally is directed on the International Paper Company—the most important factor in the newsprint manufacturing industry of this nation. President Philip T. Dodge of the I.P. is quoted in a report published yesterday as admitting that his company will in the course of the next few days announce a price of $70 a ton on newsprint in standard rolls for delivery during the first quarter of 1922. Mr. Dodge stated that the labor situation as affecting production of newsprint is improving daily and that as recently as last Wednesday the I.P. mills produced 900 tons of paper of all kinds, which is about 50 per cent of capacity. He added that he expected within the next three weeks to reach capacity production of 1,800 tons daily, as additional men are being put to work in the mills as fast as they can be obtained. Mr. Dodge declared that at $70 per ton his company will lose money, but that it was hoped, however, with increased production to more than make the loss up.

The monthly review of the paper industry in the United States for October of the Federal Trade Commission contains figures of a very gratifying character. Production of paper in October exceeded by far that of any month thus far this year, amounting to 542,408 net tons of all grades, compared with 477,926 tons in September, showing a gain in a single month of 64,482 net tons, and being no less than 171,984 tons greater than the production in July last when the depression in the paper market was greatest and manufacturing operations at the lowest point of the year. These figures indicate that whereas paper mills in the States operated at only about 50 per cent of capacity in July, based on the high marks of output reached during the boom last year, manufacturing operations were in the vicinity of 80 per cent or better of capacity in October, which, to say the least, is a most encouraging gain.

There is no question but that trade activity in paper has slowed up to a pronounced extent in New York, and, from all accounts, in all the other large distributing and consuming centres of the country. Printers and publishers and other important consumers of paper have noticeably let up in their buying recently, and the movement of paper of virtually every grade has slowed down. It is becoming more and more apparent that this is due to consuming concerns having experienced a lull of activity in their own spheres and also to their endeavouring to reduce stocks of goods so as to make as favorable a showing as possible in their year-end inventories. As one representative paper jobber termed it, the condition of the market locally is "sloppy". Demand lacks that snap that was such a feature not long ago, orders are mostly for hand-to-mouth lots of paper, and mills are sharply competing with each other in an effort to obtain as much of the business as is to be had. Prices are again fluctuating broadly, and more often in a downward direction, as would be expected with manufacturers and merchants matching their wits and quotations in the battle to procure orders.

Newsprint is probably the firmest grade of paper, that is, as respects the immediate situation. Some offerings of imported newsprint at around 3.25 cents per

pound on the dock are reported, but domestic producers are mostly securing at least 4 cents at mills for spot shipments of standard news, with some sales recorded at 4.25 cents. Print paper is moving toward publishers in a consistent way and in good tonnage, and there are no signs of any large surplus being available; in fact, the Federal Trade Commission's report shows that on October 31 but five days' average supply was held in stock by mills. The probabilities are stocks have been even further diminished since then.

Book papers display an easy price tone and some mills are cutting quotations to get business. There are reports of some sales of machine finished book at less than 6 cents per pound f.o.b. New York, while coated book paper is said to be selling in some instances down to 8 cents. Tissues are fairly steady in price but are in less demand, while wrappings are sought in smaller volume. Fine papers are holding up in price and there is a proportionately good demand for bonds and ledgers. Boards are quiet and weak. Plain chip has sold in New York this week at $28 a ton delivered sidewalk, and news board at $30, denoting declines of fully $10 per ton from recently prevailing price levels.

GROUND WOOD.—Mechanical wood pulp rules moderately steady in price and demand is sufficient to absorb the great bulk of supply offered though consumers do not seem as anxious for pulp as recently. Around $32 a ton f.o.b. grinding plants is the average of quotations named by domestic producers in Upper New York State and New England, and importers of Scandinavian and German ground wood are getting from $31 to $33 a ton ex dock New York for their pulp, making prices delivered at consuming points figure out in the near vicinity of $39 to $40. Canadian producers are reported quoting at the same delivered basis, with the result that they are in frequent cases realizing no better than $28 to $29 per ton net at shipping points, owing to the larger freights they have to pay.

CHEMICAL PULP.—Prices on domestic bleached sulphite are now at a basis of 5 to 5.25 cents per pound f.o.b. pulp mills, the higher figure being quoted on extra strong bleached and the lower on the regular No. 1 grade by leading producers. The rise in domestic pulp has occasioned higher prices on imported bleached sulphite, for which importers are now asking 4.50 cents ex dock on strictly No. 1 grades and around 4 cents on secondary qualities. Easy bleaching sulphite also is trending upward and most quotations at present range between 3.25 and 3.50 cents a pound on both domestic and foreign easy bleach. Kraft pulp holds steady at 2.75 to 3 cents on No. 1 domestic, and at an average of 2.75 cents for Scandinavian Kraft.

The chemical pulp market is quiet in comparison with the conditions obtaining a short while ago. Paper manufacturers are buying in limited amounts, yet they are readily absorbing any lots of pulp offered at what can be construed at price concessions. Sentiment in the trade is that consumers are holding back in buying until after the turn of the year, when it is expected the market will open up with a rush.

RAGS.—Business in papermaking rags is of little consequence. Demand from consuming quarters is at best light, and the limited buying being engaged in by mills is scarcely sufficient to sustain values, with the result prices are gradually sliding off.

PAPER STOCK.—Although demand for old paper has failed to expand, prices on most grades have steadied, largely because values have sunk to levels where there is little room for further decline. The market is in that condition where mills are procuring such tonnage of goods as they want at practically their own bidding prices.

OLD ROPE AND BAGGING.—Demand for old manila rope holds up fairly well and quotations are maintained at between 4.75 and 5 cents per pound at dealers' shiping points for rope in No. 1 condition of both domestic and foreign origin. Old bagging is in a lifeless market state and quotations are uncertain at about 90 cents per hundred pounds for No. 1 scrap bagging, and 1.10 cents a pound for No. 1 old gunny bagging. Mixed strings are selling in some directions in limited amounts at approximately 90 cents per hundred New York.

GENERAL CHEMICALS.

Current Wholesale Prices in New York Market, week of 30 November, 1921.

		Carlots	Less Carlots
ACID, Acetic, 56 per cent	100 lbs.	6.00-6.25	6.50-7.00
" Glacial, 99½ p. c., carboys	100 lbs.	10.00-10.50	10.75-11.00
" Hydrochloric	100 lbs.	1.25-1.50	1.60-1.75
" Sulphuric, 66 deg., drums	ton	21.00-22.00	22.50-23.00
" Sulphuric, 66 deg., drums	ton	21.00-22.00	22.50-23.00
ALCOHOL, Ethyl	gal.		4.65-5.00
" Methyl (see Methanol)			
" Denatured, 188 proof	gal.		.37-.38
ALUMINIUM Sulphate, commercial	lb.	.01¾-.02	.02¼-.02½
" Sulphate, iron free	lb.	.02¾-.03	.03¼-.03½
AMMONIUM Chloride, granular, (white salammoniac)	lb.	.07-.07¼	.07½-.07¾
" Chloride, granular, (grey salammoniac)	lb.	.07-.07¼	.07½-.07¾
BARIUM Sulphate, (prec.) (blanc fixe)	lb.	.04-.04¼	.04½-.05
CALCIUM Hypochlorite (Bleaching Powder)	100 lbs.	2.25-2.30	2.35-3.00
CHLORINE, gas, liquid, cylinders, (100 lbs)	lb.	.08-.09	.09½-.10
GLYCERINE, C. P., drums extra	lb.		.14½-.15
LEAD Nitrate	lb.		.15-.20
LITHARGE	lb.	.08-.08¼	.08½-.09
METHANOL, 95 per cent	gal.		.66-.68
POTASSIUM, Bichromate	lb.	.11-.11¾	.11½-.12
" Hydroxide, (Caustic Potash)	lb.	.05¾-.06	.06¼-.08
" Prussiate, yellow	lb.	.21-.21¼	.21½-.22
SALT CAKE (bulk)	ton		20.00-22.00
SODA ASH, Light	100 lbs.	2.00-2.10	2.15-2.50
" " Dense	100 lbs	2.35-2.40	2.45-2.70
SODIUM Borate, (borax)	lb.	.05½-.06	.06½-.07
" Carbonate (sal soda)	100 lbs.	1.80-1.90	2.00-2.20
" Hydroxide (caustic soda)	100 lbs.	4.00-4.10	4.15-4.50
" Prussiate, yellow	lb.	.14½-.14¾	.15-.15½
SULPHUR, Crude	ton	18.00-20.00	
" Dioxide, liquid cylinders extra	lb.	.08-.08½	.09-.10

Buying power in the New York market was interrupted by holiday period (American Thanksgiving). One prominent item was the position of caustic soda in foreign markets—large tonnage sales were recorded —the bulk being shipped to Europe and South America.

It is claimed that the big shot for expansion depends upon the result of the disarmament conference.

WHY DON'T YOU GO TO CHURCH?

You are too tired to go to church! What nonsense. There isn't a place on this continent so restful as the church. You are going to lie around the house all day; loll in a rocking chair; go to sleep over a book. That isn't resting, that's loafing. Tell yourself, honestly, did you ever in your life see a loafer who looked rested? Did you ever see a loafer who didn't look tired all the time? The people who try to rest are always tired. Resting is the hardest work in the world when you make work of it. Two hours in church, two hours in the quiet; the music, the sermon, the reading, the uplift which comes from the new channels into which your mind is led, will rest you more physically, morally, intellectually, than all the day spent in trying to rest. Why don't you go to church?—Bob Burdette.

New York, December 1st, 1921.

Removal Notice.

We desire to annouce the removal of our office to more spacious quarters on the seventeenth floor of the Vanderbilt Concourse Building, 52 Vanderbilt Avenue (opposite Grand Central Station at 45th Street), where we will be pleased to welcome you at your convenience.

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THE SAFETY HABIT.

Safety should be a habit. A thing done the first time is hard to do. The next time it is easier, until in a short time it is done without the slightest thought—purely mechanically.

It is the same with safety. If safe methods are adopted in every action around the machines, and in every bit of work done, it is a little strange at first, but presently a man gets the safety mind and he does things the safe way in a purely mechanical manner.

Christmas will soon be here. What is your present going to be to your wife and kiddies? Is it going to be a full pay envelope with nothing off for accident due to carelessness, or is it going to be a slim envelope and a maimed body?

The National Safety News tells of a foreman, Mike McDonald, six feet two, who says what he means, and stands by it. When Mike first heard Safety talk he characterized it as a lot of hot air. Then one day one of Mike's best men, working on a line shift, was caught on a set screw and whipped to death. Mike had to break the news to the wife and children.

The morning after the funeral Mike called all his men together. "We have lost one of our best men and a widow and five children have been left. I was to blame. It was up to me to remove that set screw. Beginning this morning, we are going to make this department safe. I will go the limit to keep you men from being injured, if you will go with me, and I want every man to consider himself a committee of one and report to me anything which may cause an accident."

Inside six months every machine in a dangerous condition in Mike's department was guarded. He made a record of two hundred days without an accident, and reduced the lost time due to accidents by 72 per cent. When asked how he did it, his reply was, "The way to do safety work is to go at it with two hands and a heart and get your men with you." —Broke Hustler.

The Quebec Government has agreed to a grant of half the cost of a new bridge over the St. Francis River, East Angus, to be paid in five instalments. The interest on the instalments is to be paid in advance. The Brompton Pulp and Paper Company, whose plant adjoins the bridge, will pay one-third of this amount.

VAPOR ACCUMULATOR.

An invention which should be of great interest to the chemical pulp industry as well as to other industries working with varying steam demands, breweries, sugar refineries, etc., is the Vapor Accumulator, patented in some thirty different countries, among which are Canada and the U.S.A.

The principle of the invention is to equalize the varying requirements for steam in an industrial plant by storing the heat in water when excess steam is being produced, and giving off this steam when it is needed, thus practically making the boiler plant independent of the variations in the steam consumption.

As, under these conditions, the firing can be carried on evenly, and without either forcing or holding back, and as the load, consequently, can be kept comparatively constant, the fuel can be utilized very effectively.

The Brown Corporation, La Tuque, Que., have had an installation of a Vapor Accumulator in operation in connection with their sulphate pulp mill, for some six to eight months.

The Vapor Accumulator consists principally of a large tank containing water, in which the excess steam produced in the boiler house during times of light steam demand is stored, while the tank gives off the steam thus stored, when it is needed.

The installation is said to be working very satisfactorily, effecting a considerable saving in fuel.

TRADE PROSPECTS WITH MEXICO.

Canada's influence in Mexico has for years taken the form of branch banks and the financing and management of many industrial and public utility plants.

Major Chisholm, former Canadian Trade Commissioner, stated recently that Mexico is now heading quickly back to her former state of prosperity and presents an exceedingly attractive market for Canadian products.

Mexico should be added to the list of foreign markets made available through the operation of the Canadian Merchant Marine. As a matter of fact, the Canadian National Railways Management has sent a special representative to make an investigation of traffic conditions there in respect to services on both the east and west coast. Canadians are well regarded in Mexico, and it only needs the practice of salesmanship and proper shipping facilities to establish very extensive and profitable trade in natural and manufactured products of the two countries.

Life is too short to remember unpleasant things.

Scandinavian American Trading Co.

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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P.Q., December 15, 1921. No. 50

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager,
Gardenvale, P. Q.

H. W. Thompson, Western Manager,
Toronto Office, 1402-3 C.P.R. Building,
'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager,
528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

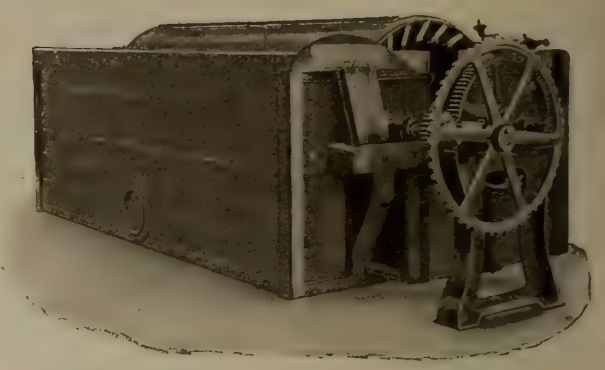
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One Wood's Machine will thicken 30 tons of Chemical Pulp in 24 hours

The Wood's Machine, used as pulp thickener, saveall, pulp washer or water filter, represents a wise investment for pulp and paper mills.

Notable advantages of the Wood's Machine are: Great capacity, low wire costs, negligible repair and labor costs, and small amount of power required. Wire life on many of these machines has been more than one year of continuous running, making wire cost less than one-half cent per ton. Many have been in operation more than one year without repair or labor costs.



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EDITORIAL

A NOBLE LIFE.

The name of Sir Arthur Pearson and the noble life that he has so efficiently and unstintingly poured out in the cause of those afflicted with blindness, is known throughout the civilized world. Sir Arthur had already made an enviable record as a successful publisher and was in the midst of an unusually active business career when in middle life he became aware that he was doomed to total blindness. With the courage and cheerfulness quite in keeping with other qualities of his great character, he began to apply himself to the mastery of the Braille text so that he might devote his unusual abilities to the aleviation of the disadvantages and the discouragement of others likewise afflicted. When the dark days came, Sir Arthur was prepared financially, mentally and spiritually to begin the work which has really been his greatest contribution to his time and a contribution we may say, that could hardly be surpassed by any human effort.

With his great organizing ability, his kindly disposition, and his undaunted courage, Sir Arthur Pearson has accomplished a work which is of the greatest possible benefit to his fellow sufferers. Sir Arthur's idea was not to endow retreats where blind people could sit in idleness and comparative comfort, shut out from the world, simply to await their end; he had a nobler conception, and thousands will thank him for the success which has met his efforts to establish, or to assist in organizing, schools where the blind could not only learn to read but where they could learn to perform many manual duties and thus make themselves not only self-supporting, but actually agents contributing to the welfare of their fellow men. There are many in Canada who are indebted to Sir Arthur for much of the measure of cheerfulness and hope and content which is now theirs. There are many throughout the world who are now feeling the pangs of grief and loss in the death of this real nobleman who through an unusual accident, is now no longer able to guide and council those who are devoting themselves to the assistance of the sightless.

Keep This Week Free

of other engagements

PAPER WEEK IN MONTREAL

January 23-27, 1922

Canadian Pulp and Paper Association and its Affiliated Bodies

Formal Programs and Invitations now in preparation

THE AUSTRALIAN TARIFF.

On another page of this issue is an interview which deals with the situation in Australia, particularly as regards the tariff. It is quite evident that the tariff imposed by the Australian Government is so drawn that Canadian mills are given a distinct advantage over Scandinavian and Japanese producers, although British mills have the benefit of perhaps undue preference. It is a bit unfortunate that unavoidable occurrances of the war period should be revived in connection with this measure and we are inclined to think that the Australian Government have attempted to be as generous in the matter as they felt they could afford. We believe it is about time for our industry to consider competition in foreign markets purely on the basis of efficient economical production with due consideration for the protection of our natural resources and to depend less on preferential tariffs, no matter how acceptable such considerations are. We consider it largely a matter of self-protection for the various parts of the Empire to inaugurate graduated tariffs with respect to imports from other parts of the Empire as compared with other countries. There is undoubtedly a certain satisfaction in doing business with ones friends and relatives and with one's brothers-in-arms. While it may have been possible, and may yet be both possible and desirable to agitate for a greater preference for Canada's newsprint in the Australian market, it would seem that that is a matter largely for the Australians themselves to argue in order that their supplies may be cheaper rather than that additional profit may accrue to someone else.

The object of their tariff is to provide revenue, especially in this case, where there is no paper industry needing protection.

If Canadian mills cannot make paper more cheaply than their British competitors and within $15 a ton of the production cost to the Scandinavians and Japanese, there is quite evidently something wrong with our methods of manufacturing and distributing newsprint. Our chief obstacle is the blind manner in which our mills

have deliberately increased the cost of their wood by careless logging methods.

MAKING USE OF THE TEXTBOOKS.

One of the most encouraging bits of information reaching us for sometime, is the following quotation from a letter received by the Secretary of the Joint International Committee on Education which has charge of the preparation of the Text Books. It comes from Mr. A. D. Wood of the Champion Fibre Company, Canton, North Carolina. Some months ago a reference was made to the proposed plan of co-operation between the Champion Fibre Company, the town of Canton, the State of North Carolina and the Federal Board for Vocational Education. Since then, as will be seen, a number of classes have been successfully started, at least one of which is in charge of a representative of the Federal Board. This class, in Foreman Training, covers a subject which is of vital importance to the successful operation of any industrial plant and aims to educate the foreman and instruct him in his duties as an administrator. It will be seen that such instruction is not within the scope of the text books, the aim of which is to assist in the education of men in the Pulp and Paper Industry along the line of manufacturing operations. It is very encouraging indeed to have such a good report of the work which is being done at Canton and we are sure that readers of the Pulp and Paper Magazine will look forward with interest for the more extensive explanation of the work which Mr. Wood has now in preparation.

"Relative to the foreman training course, of which you wrote me on October 10th, I know you will be pleased to learn that the class was started on the 7th of November, as scheduled, with an enrollment of fifteen foremen, under Mr. Cushman of the Federal Board, and that at this time we find that there is great enthusiasm among the members of the class. I might go a step further and state that everybody is enthusiastic about the work which is being done.

You wrote me concerning the making of a report of the proceedings and am glad to report that through the co-operation of Mr. Cushman (he may tell you that a part is due to the fact that we are all co-operating with him) I hope to be able to send within a week or ten days a mimeograph report of the proceedings of each session, together with graphic charts made by the men themselves during the sessions, and a summary of the work.

The class meets each day at 9.00 a.m. at the Champion "Y" in one of the classrooms and the session lasts until 12.00 p.m. Mr. Cushman meets with the superintendents at 1.00 p.m. and is with us until 2.00 p.m. during which time he gives us a review of the work which is being carried on at the Foremen's Class. He then goes into a session with the foremen which lasts until 5.00 p.m.

It is a strange thing that these men, foremen accustomed to active work in the mill, are leaving their daily session of six hours and many of them are going home and typing and making charts of the day's lessons. At five in the afternoon they seem to be full of pep and eager to go on. This class is the only one which is being carried on on "Company Time."

We had a picture of the class yesterday and if the proofs are o. k. will send you one. I am also planning to have photos taken of the other thirteen classes which meet at the "Y" in the evenings. Among these we have two classes in Pulp Making and two in Paper Making, using T.A.P.P.I. textbooks. It may interest you to learn that instead of confining ourselves to the use of the textbooks, which to the beginner is simply a course in arithmetic, that we divide the session into two three quarter hour periods, devoting half the time to the study of the books and the other three quarters of an hour to a lecture and discussion on some phase of mill work. So far this term I have managed to keep my class interested in this way and I think the other teachers find that this is the best way to hold the interest of the pupil.

Ever since you and the other members of the Committee invited me to join you I have been puzzling my mind, wondering how I could be of real service, and it is gratifying to me to have this opportunity of reporting on the progress of this work. Any suggestion you may make will be gratefully received."

SAW WOOD.

The old injunction to "say nothing, but saw wood", is a good motto. It applies as a distinct compliment to the Forestry Departments of New Brunswick and Ontario. These governments have wisely decided to help the unemployment situation by providing work in the woods on Crown lands, cutting pulp-wood and lumber. This plan has the great advantage of putting charity on a "return value" basis and really investing money in labor which will convert a dead resource into a live asset, even though a good demand for it is not likely to develope for a year. Wood so cut should not be dumped on the market, however.

VISIT TO CRABTREE MILLS.

The editor of the Pulp and Paper Magazine, accompanied by Mr. Archibald of the Harland Engineering Co. visited Crabtree Mills last Friday. Mr. Kay Crabtree escorted them through the mill and described the large amount of new construction which has recently been completed, making this plant of the Howard Smith Paper Mills a most efficient unit. An excellent grade of sulphite bonds and litho paper is produced. The Harland sectional paper machine drive was seen in operation, giving complete satisfaction. It was taking less than 60 H.P. to run the 90" machine. Provision has been made for the installation of a groundwood mill in the future.

"The weight of a cloud a mile high and two miles in diameter has been estimated at 200,000 tons." No wonder the clouds that recently hung over business caused a depression.

The Manufacture of Pulp by Means of Chlorine

UMBERTO POMILIO.

(Translated from CHIMIE ET INDUSTRIE, 6, 267-275, September, 1921, by A. Papineau Couture).

The process of extracting cellulose from plant materials by means of chlorine on a laboratory scale has been brought to a high degree of perfection.

Cellulose is found in very considerable quantities in the vegetable kingdom, as it is the main constituent of plants. It occurs along with other organic bodies of different constitution, namely, vasculose or lignocellulose, pectose or pecto-cellulose, and cutose.

Cellulose is relatively inert chemically. It resists fairly well the action of various chemicals; it does not give addition products with the halogens, it resists to a certain extent the action of alkalis and of acids, and also the hydrolyzing effects of oxidizing agents.

On the other hand vasculose, pectose, and cutose are attacked by a certain number of reagents which have little or no action on cellulose.

Three methods have been proposed for the extraction of cellulose from plant materials:

(1) Treatment with caustic soda;
(2) Treatment with bisulphites;
(3) Treatment with an oxidizing agent and then with alkali.

From a purely theoretical point of view the last of these is the best. Cross and Bevan in their **Text Book of Paper Making** (1920, p.4) give the following method for the separation and determination of cellulose:

"(a) The fibrous raw material is boiled with a dilute solution of sodium hydroxide (1-2p.c. NaOH), and, after thorough washing, is (b) exposed in the moist state to an atmosphere of chlorine gas;

(c) It is again treated with boiling alkaline solution.

By such treatment of the majority of vegetable tissues, the "non-cellulose" constituents are removed, and a residue of cellulose obtained. A slight treatment with a bleaching agent, to remove residues of colored impurities, and a final washing with alcohol and ether, complete the purification, and the cellulose is obtained as a mass of ultimate fibers of pure white color, more or less translucent."

With respect to ligno cellulose, which is the most important of the substances which the pulp manufacturer must get rid of, the same authors say (pages 61, 62, 63):

"Ligno-cellulose is differentiated from the celluloses by the following characteristic reactions.....

"But the most characteristic of its reactions is that of direct combination with the halogen elements, and notably chlorine. The combination is attended with change of color to bright yellow; the yellow quinone chloride is dissolved by a solution of sodium sulphite, with development of a magenta red coloration.

"While serving thus as a qualitative reaction for the identification of the ligno-cellulose, it is also one which takes place in definitely quantitative proportions. .....

"From its critical importance, the process of chlorination of the jute ligno-cellulose will be described in detail. The fiber is prepared by a preliminary treatment with a boiling solution of sodium hydrate (1 p.c. NaOH). From this it is well washed and squeezed to retain not more than its own weight of water. In this condition it is exposed for one hour to an atmosphere of washed chlorine gas. The fully chlorinated fiber is washed to remove the hydrochloric acid formed in the reaction, and transferred to a solution of the sulphite 1-2 p.c. sodium sulphite) in which it is boiled. To complete the isolation of the cellulose, the solution is made alkaline with sodium hydrate (0.2 p.c. NaOH), after which the boiling is continued 2-3 minutes. The fibrous mass is thrown on a cloth filter and washed thoroughly. This residue is the most pure **cellulose**; and the entire elimination of the non-cellulose components of the original fiber is shown by failure to react with the various reagents previously cited.

"The following are important quantitative data. The yellow chlorinated derivative has the empirical formula $C_{19}H_{18}Cl_4O_9$; to form this derivative the fiber substance (purified and prepared by the boiling with alkali) takes up 8% of its weight in **combination**; at the same time an equal amount goes to form hydrochloric acid. The proportion of cellulose yielded is approximately 73-80%, according to the quality (and purity) of the fiber. This cellulose is a mixture of two celluloses — **alpha-cellulose**, resembling the normal cotton cellulose, and **beta-cellulose**, a furfural-yielding

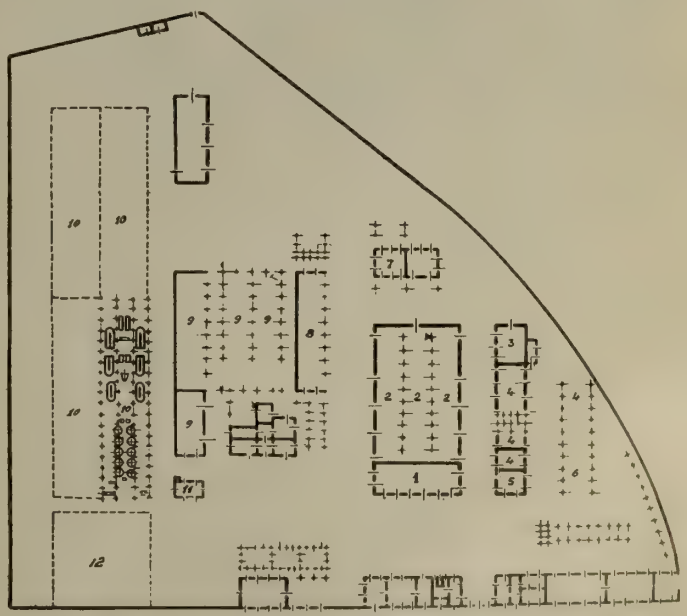


Fig. 1—Plant of the Elettrochimica Pomilio, Naples, for the Manufacture of Caustic Soda, Chlorine, and Pulp.
1. Electric Power Station.
2. Electrolytic Cell Room.
3. Salt Storage.
4. Electric Evaporator and Caustic Fusion Pot.
5. Chlorine Liquifying Plant.
6. Javelle Water (Sodium Hypochlorite Solution).
7. Hydrogen Compressor.
8. Synthetic Hydrochloric Acid.
9. Bleaching Powder.
10. Cellulose.
11. Boilers.
12. Storage for Hemp Stalks.

cellulose—and much less resistant to hydrolytic treatments, both acid and alkaline. In other processes of attacking the fiber for the isolation of cellulose, this latter is hydrolyzed and dissolved and the yield falls to 62-66%."

On page 71 of the above mentioned treatise; the authors insist on the fact that the chlorination method is the most suitable and the most perfect for the separation of cellulose in the laboratory. They also make mention of two other methods, one of them being based on the action of dilute nitric acid at 60° to 80°C. But they add that these methods are not used industrially.

The main reason is the excessive cost of these reagents. But it must not be forgotten that the authors are English. In England there is no great production of electrolytic chlorine, and hence the manufacturers are not faced with the problem of disposing of the chlorine produced in the preparation of electrolytic soda. A large proportion of their caustic soda is produced from sodium carbonate by the old Leblanc process, and chlorine is mostly produced chemically from hydrochloric acid. It is evident that under such conditions the high cost of chlorine must be taken into account when it is to be used for such purposes as the separation of cellulose; for this necessitates the use of liquid chlorine in drums or cylinders, which is more expensive than moist chlorine gas.

On the other hand, the opinion of the authors with respect to processes based on the action of such oxidizing agents as nitric acid is entirely warranted.

As far as cutose is concerned, the authors consider that the chlorination method is the only one which can effect a complete separation of the cellulose of flax. They show that the cuticular tissues of flax contain a considerable amount of amino compounds which react readily with chlorine, yielding characteristic chloro-amino-derivatives. The chlorination method is therefore the standard laboratory method for the accurate determination of the cellulose content of plant materials. It is the most perfect and it gives the maximum yield, provided it is properly carried out.

Numerous attempts have been made to apply this method to commercial operations. Cross and Bevan themselves describe a process for preparing straw pulp by means of chlorine gas. They state the yield is appreciably higher than by the soda process, and they admit that the chlorine cellulose is purer than soda cellulose. But the chlorine used was prepared by the oxidation of hydrochloric acid by means of manganese dioxide, which rendered the process too costly.

Owing to the high quality of the chlorine cellulose, and owing to the fact that the process would probably give theoretical yields, a large number of technicians attempted the application of this process to large scale operations. Kellner patented the use of electrolytic chlorine for the preparation of pure cellulose; but his process consisted in the preparation of cellulose by means of an alkaline hypochlorite produced *in situ* rather than by means of chlorine gas. William Mather also devised and proposed an apparatus for the manufacture of chlorine cellulose. In different countries various solutions of the problem have been suggested; but, as far as we are aware, when they were tried out commercially they were either incomplete or too complicated to be practical.

In Italy Beniamino Cataldi tackled the problem experimentally, but on a commercial scale. In 1916 he obtained an Italian patent covering the use of chlorine for the manufacture of pulp. The corresponding French patent (No. 492,222) delivered on September 9, 1916, makes the following claims:

"(1) A chemical process for the extraction of cellulose from vegetable fibers, such as wood, cotton, straw, esparto, etc., characterized by the fact that the wood is previously decorticated and chipped by suitable machines in the usual manner, while if other vegetable fibers are used these are previously crushed. The prepared material is charged into autoclaves which are lined with acid-proof brick, and is cooked in a weak

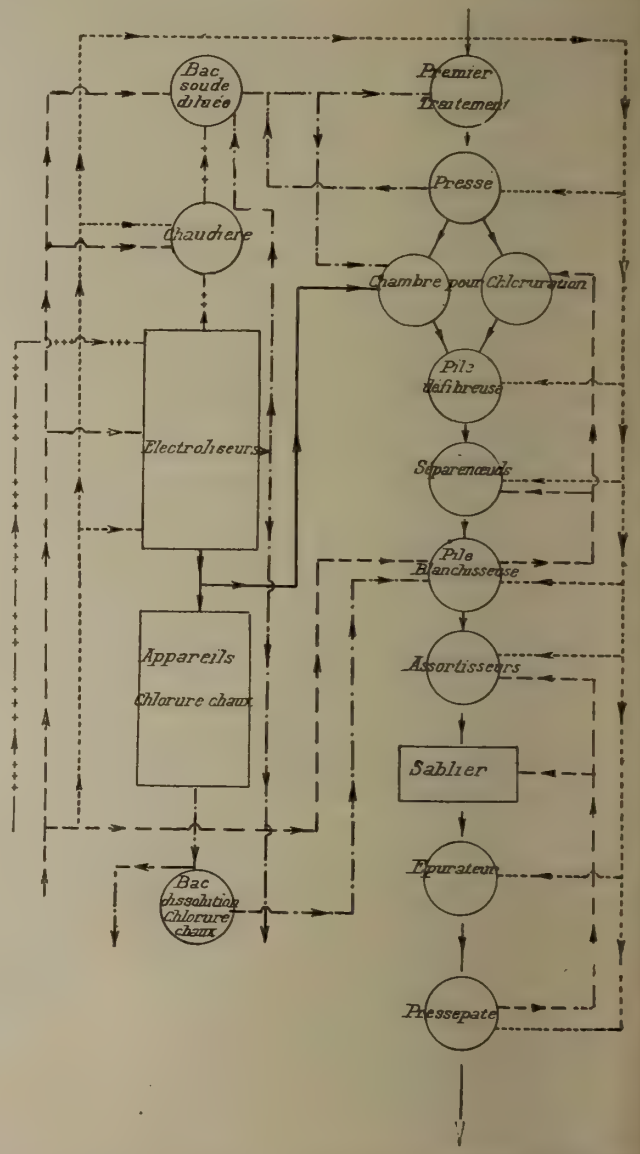


Fig. 2—Diagram showing the production of cellulose by means of chlorine.
Caustic soda ——'——
Water ——.——
Electric wiring ------
Chlorine Gas ————————
Bleaching powder solution ——.——
Steam ——x——
Hydrogen ——xx——
NaCl solution ——xxx——
Bac de soude diluée—Tank for Dilute Soda.
Chaudière—Boiler.
Electroliseurs—Electrolytic Cells.
Appareils Chlorure de Chaux—Apparatus for making Bleaching Powder.
Bac Dissolution Chlorure de Chaux—Tank for Dissolving Bleaching Powder.
Premier Treatment—First Treatment.
Presse—Press.
Chambre pour Chloruration—Chlorinating Chambers.
Pile Défibreuses—Defibering Engine.
Assortisseurs—Classifiers.
Sablier—Sand Trap.
Euprateur—Screen.
Presse Pâte—Wet Machine

alkaline liquor for a greater or less length of time according to the concentration of the liquor. After removing the liquor from the autoclaves, they are put under a vacuum of 50-65 cm., and then chlorine gas is introduced until the vacuum indicator registers zero; and the wood or other material is acted upon for one or more hours according to the nature of the fiber which is being treated. After the chlorine treatment the wood is washed with pure water and is given a second alkaline treatment identical with the first, but slightly shorter, which completely eliminates all incrusting matters and impurities from the material under treatment and yields a pulp which is washed, purified, and ultimately bleached in a weak solution of sodium or calcium hypochlorite.

"(2) A modification in the separation of cellulose from cotton, jute, and similar vegetable fibers, whereby the water absorbed by the fibers in the first alkaline treatment by means of hydro-extractors (centrifuges) before subjecting the fibers to the action of the chlorine."

A few additional patents were also taken out on the subject. As the tests gave encouraging results, a company was formed to work the patents obtained. It built in Northern Italy a mill which was completed in 1916. The process used was based on the experience acquired in carrying out the preliminary experiments; but there were numerous difficulties entirely apart from the theoretical principle on which the process was based, which cropped up and were successfully overcome.

Perfectly white wood pulp (balsam, poplar, willow, etc.) has been prepared in this mill. Straws (wheat, rice, etc.) have also been treated. And at the present time it turns out several tons of poplar pulp a week. The working of the process on a commercial scale for the last four years has shown conclusively that theoretical yields can be obtained; but at first the results were but indifferently good, in spite of the fact that the laboratory tests had given a yield of 100% of the cellulose available in the plant.

The poplar cellulose which is now prepared is pure and very white. It is sold to several paper mills. The



Fig. 3—From left to right: Chipper, Vacuum Pump, and Autoclave for impregnating the wood.

quality of the pulp is so good that it sells for about 20% more than soda pulp prepared from the same wood.

The poor yields which had been obtained so far in the commercial treatment of plants by chlorine were due to the reaction of the chlorine on the non-cellulose constituents of the plants according to the following general equations:

$$Cl_2 + R.H. = H.Cl + R.Cl$$
$$Cl_2 + H_2O + R.COH = 2HCl + RCO_2H$$

These two reactions take place at the ordinary temperature and are exothermic. Moreover as is seen, they give rise to the formation of large amounts of hydrochloric acid. It is thus seen that the most favorable conditions of temperature and reaction medium under which treatment is started, disappear when large masses of vegetable matter are treated with chlorine, for the temperature rises and the hydrochloric acid formed attacks and destroys the cellulose. The compounds of general formula R.Cl or R.COOH, which are obtained from the non-cellulosic constituents are for the most part insoluble and must be eliminated by transforming them into the corresponding sodium salts and washing thoroughly.



Fig. 4—Battery of concrete chlorinating autoclaves.

In 1919 the "Elettrochimica Pomilio" company decided to work this process in its electrolytic chlorine plant at Naples. A first unit having a capacity of 10 tons a day is almost completed (See Fig. 1) and provision has been made for doubling or quadrupling the production if desired. The chlorine will be used in the gaseous form directly as it comes from the electrolytic cells, for the treatment of the following materials: poplar, Lybian esparto, but especially hemp and hemp waste.

Hemp is extensively cultivated in Southern Italy. It does not yield a pure white cellulose by the alkaline processes, and yet hemp cellulose is very interesting, as shown by the following extract from the official report of the **R. Stanzione Sperimentale per lo Studio della Carta delle Fibre Tessili**, of Milan, on paper pulp obtained directly by chlorination of hemp stalks.

"This process has completely eliminated the ligneous material which was present in the hemp stalks, for the cellulose obtained does not give any reactions with the usual reagents for the identification of ligneous fibers: phloroglucinol, aniline sulphate. Microchemical reactions also prove the absence of lignin in this cellulose. The purified fiber is colored grey by

a solution of iodine in potassium iodide, and blue by chloriodide of zinc. These reactions are characteristic of chemical pulps which have been completely purified of all incrustants.

"If the hemp cellulose is treated for 30 minutes with a cold 17.5% caustic coda colution, there remains 71% of unattacked material, while 29% is converted into hemi-cellulose soluble in caustic soda.

"The sheets of paper prepared from this pulp were particularly rigid, and possessed a pronounced translucency.

(Signed) CAMILLIO LEVI, Milan,
(Dec. 10, 1920)."

If the hemp stalks had been subjected to the soda treatment, a considerable proportion of the cellulose would have been lost by being converted into soluble hemi-cellulose.

Theoretically the new chlorination process for the preparation of pulp is the simplest. The chemical processes involved consists essentially in:

(1) Soaking with a dilute caustic soda solution;
(2) Acting upon it with chlorine gas;
(3) Washing with a weak alkaline solution.

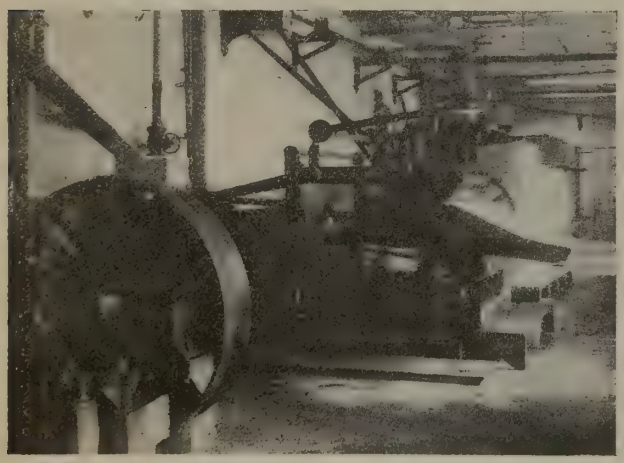


Fig. 5—Wet machine and pile of chlorine poplar pulp.

The mechanical operations required are about the same as in other processes: defibering, screening, bleaching, making into sheets, drying. (See Fig. 2.)

The originality of the process lies in the fact that the various chemical operations which are employed can be controlled and regulated. The chlorination, for instance, is very easily regulated. It follows that one can control the speed of the reaction, the temperature of the mixture, and the concentration of hydrochloric acid. The various conditions can thus be maintained very close to the optimum conditions of the reaction.

The commercial preparation of 100 kilos of poplar pulp requires:

Moist chlorine gas	28 kilos
Coal (or its equivalent in other fuel)	16 "
Bleaching powder	6 "
100% caustic soda (as a 5% solution)	5 "

These figures will naturally vary with the amount of cellulose contained in the material under treatment: the higher the cellulose content, the lower the consumption of chemicals.

The above figures correspond to a minimum consumption of caustic and to a maximum consumption of chlorine. As the latter is produced electrolytically, and an excess is nearly always available, it is advisable to utilize as much of it as possible. However, if desirable the pulp manufacturer can reduce the amount of chlorine and increase the soda consumption. In other words, the amounts of chlorine and of caustic used may be varied in opposite directions according to the market prices of these commodities.

Laboratory and mill-scale tests have shown that the caustic can be replaced by an equivalent amount of quick lime.

A production of 10 tons of cellulose per 24 hours requires a force of 50 men (three shifts), and about 80 kilowatts for the mechanical operation.

The usual fixed or rotary digesters, with or without forced circulation, have been replaced by cylindrical tanks for the alkaline treatment and chlorination chambers, equipped with special piping and valves. The steam plant is reduced to one-tenth of that required for the soda process. The soda recovery plant is entirely eliminated. Defibering and disincrustation are very easily carried out, and the same is true of bleaching. The water consumption is the same as for the other processes. The waste waters are easily disposed of; but it is advisable to make provision for means for the full neutralization of the hydrochloric acid, say by discharging the waste waters from the chlorination apparatus onto a bed of limestone. Except for a few details in the mechanical equipment, a given equipment can produce pulp from various kinds of wood, straw esparto, or any other suitable raw material.

A building one story high and having an area of 1,500 square meters can house the equipment required for the production of 10 tons of finished pulp per 24 hours, exclusive of storage space.

In my estimation the chlorine gas process for the preparation of pulp is the most economical. Henri de Montessus de Ballore in his book on ESPARTO AND ESPARTO PAPERS (**"Alfa et Paper d'Alfa"**), and his other book on the MANUFACTURE OF PAPER PULPS OTHER THAN WOOD PULP (**"Fabrication des Celluloses de Papeterie autres que celle du Bois"**) (1919) gives the following figures for the manufacture of 100 kilos of chemical esparto pulp:

Esparto (yield 45%)	222.00 kilos
Coal	150.00 "
Soda Ash	22.22 "
Lime	26.66 "
Bleaching Powder	17.75 "
Sulphuric Acid	1 liter

The amount of soda ash used is really greater than 44 kilos; but 75% of it is recovered and the cost of salt is about one-third that of soda ash. It is on these data that the consumption of 22.22 kilos of soda ash is based.

The following figures were obtained from an Italian straw sulphate mill:

Wheat Straw	320 kilos
Coal	180 "
Soda Ash	20 "
Sodium Sulphate	32 "
Lime	34 "
Bleaching Powder	20 "
Sulphuric Acid	1 liter

These figures show a yield of only 31% as against 46-47% obtained in the laboratory by Muller.

The consumption of the various materials in the commercial preparation of 100 kilos of chlorine pulp from straw are as follows:

Straw	266 kilos
Chlorine	28 "

Coal	15	"
Bleaching Powder	6	"
Caustic Soda	5	"

If the figures for the different processes are compared, it is seen that the coal consumption for the chlorine process is reduced by 90%, that of soda 75%, and of bleaching powder 67%. The consumption of the vegetable raw material is also reduced by about 20%. The use of lime is entirely eliminated; but on the other hand 28 kilos of moist chlorine gas are required. The cost of the chlorine will depend on the manner in which it is used: if it is used directly as it comes from the cells, it costs but a fraction of what liquid chlorine in cylinders would cost. At any rate, the cost of the chlorine required is small as compared with the saving in coal and soda consumption.

To this lower cost of raw materials must be added a saving of 50% on the first cost of the plant. These figures are naturally subject to variations according to the economic conditions in various countries.

This method of utilizing chlorine furnshes a very satisfactory solution to the problem of the over-production of chlorine. In his book on ELECTROLYTIC SODA (**"La Soude Electrolytique"**) A. Brochet states (page 9), "When electrolytic soda was first proposed,



Fig. 6—Microphotograph of hemp stalk pulp.

the question immediately arose what will be done with the chlorine?"; and on page 11, "But if the ammonia process has been able to compete for so long with the Leblanc process in spite of the fact it was not helped out by chlorine, the electrolytic process does not seem to be in the same position, at least at present, and it is necessary that chlorine, in some form or other, should bear its share and help to maintain the balance." If electrolytic chlorine can be produced at a reasonable cost and find a ready market, electrolytic soda will be in a position to compete with Leblanc soda and with Solvay soda.

The most important chlorine compound, from a commercial point of view, is bleaching powder or chloride of lime. But the demand for this product is not sufficiently great to absorb all the overproduction of chlorine nor to raise the sale price. In the book already mentioned, Montessus de Ballore (page 76) says of electrolytic soda: "The fact that this industry has not developed as had at first been expected that the chlorine would find a ready market in the form of bleaching powder; but the market for this product is very limited, and as the production of a ton of soda corresponds to the production of 2.25 tons of chloride of lime the market for this product was soon glutted and prices slumped."

The problem of the over-production of chlorine still exists, and some large chlorine plants erected during the war are eagerly seeking some new outlet for their product.

The manufacture of chlorine pulp which can use up to 50% of its weight of chlorine, affords an almost unlimited market, and would thus seem to give the true solution of the problem.

In countries where water powers are available, the raw materials required are sodium chloride and suitable plants, that is, the materials required for the manufacture of chlorine, soda, and cellulose. The production of pulp by this process will be suitable whereever there is a large market for the soda produced. The importance of such a process is all the more evident, as the soda and pulp industries have been seriously menaced by the fuel shortage.

It is therefore highly advisable for electrolytic chlorine plants to adopt the chlorine gas process of pulp manufacture, as has been done by the "Elettrochimica Pomilio." They should not, however, attempt to make a pure bleached pulp, unless they have a plentiful supply of pure water. But there is nothing to hinder them from making a half-stuff by eliminating the non-cellulosic constituents of the plants by chlorination and washing with alkali. The only operations which would then have to be carried out would be lixiviation, chlorination, alkaline washing, which could be effected by using both the chlorine and the alkaline liquor directly as they come from the cells. Such a pulp could easily find a market with paper mills which possess the required equipment for defibering and bleaching.

On the other hand, the process can readily be adapted to existing pulp mills. As all the larger pulp mills have electrolytic cells for preparing of their own chlorine and towers for the preparation of their bleach liquors it would be easy to expand existing equipment and to construct chlorination chambers for the treatment of the plant materials. Under these conditions the lixiviation and the soda recovery plants would become useless. There would merely be required multiple-effect evaporators for the concentration of the cathode effluent from the increased number of cells, so as to adjust the concentration of the electrolytic soda solution.

The **"Elettrochimica Pomilio"** is at present conducting experiments on the recovery of the hydrochloric acid and of the chlorinated derivatives formed by the action of the chlorine on the non-cellulose constituents of the plants, and is endeavoring to find commercial uses for these by-products. In certain cases the recovery of these by-products may be of great importance. A judicious use of the raw materials together with a systematic recovery of by-products can give very satisfactory results from the point of view of economy.

TIMBER LIMIT SOLD.

Vancouver, Dec. 8.—Alex. McLaren of Buckingham, Quebec today sold a timber limit at Chilliwack to Westminster Mills for $600,000. The property has been held by the McLaren family for 32 years. Mr. McLaren still has extensive holdings in Vancouver Island.

Fractional Boiling of Grasses*

By Major J. EDINGTON AITKEN.

The separation of fiber of esparto from the affiliated ingredients with which the cell wall and canals of the plant are incorporated is — as far as possible — effected in the boiling stage of the manufacturing process. The fiber or cellulose is relatively resistant to the action of chemical reagents, which have the effect of forming soluble compounds with the non-cellulose constituents of the growing plant, and which persist after harvesting and drying. The removal of these substances from the desired and required fiber is effected by subjecting the esparto to the action of an alkali, in a suitable type of boiler, constructed in such a manner as will enable the alkaline liquor to act uniformly upon the esparto.

These initial sentences have something of a text-book savour, but it is necessary that we should state bare facts before proceeding to construct a scheme of treatment which is capable of yielding the best results at a minimum of cost.

Noncellulose Constituents of Plants.

The non-cellulose constituents of plants in general, and — from the papermakers' point of view — esparto in particular, are divided into three groups:

1. Starches, and similar compounds.
2. Pectoses.
3. Lignins.

The members of each group possess different degrees of solubility and affinity for chemical reagents. The starches and affiliated compounds are soluble in boiling water. The pectoses form soluble compounds with weak alkali, which are thereafter soluble in boiling water. The lignins are much more resistant, requiring drastic treatment with a strong alkali and a higher temperature.

In general practice, the papermaker carries out the three reactions at the same time, thus effecting *more or less* complete resolution in one operation; which naturally appears to be the acme of economy. This economy, however, is only apparent, though it is based upon the grandmotherly advice not to make three bites of a cherry. If we take only one bite, the chances are that we will swallow the pip, which misfortune might easily lead to injurious results. In making one stage of the process of esparto boiling, we get, as I have just stated, a *more or less* complete resolution, but, as I shall indicate later, the result of one part of the digestion can, and generally does, act injuriously upon another, thus the removal of the products of the boiling process become considerably *more or less* incomplete; and we do not obtain the same assured success as is possible if the boiling is fractionated.

Treatment Required in Boiling.

Some years ago I made a considerable number of experiments with the object of ascertaining the relative degree of treatment required in boiling, for the reduction and solution of those non-celulose constituents, and the possibility of making them applicable to the manufacturing scale.

William Raitt, cellulose expert to the Indian government, was working on a similar scheme, and we discussed the subject together at considerable length, with reference to its applicability both to bamboo and esparto. It is most gratifying to know that Mr. Raitt has been successful in treating bamboo on the commercial scale by fractional digestion, and that many of the difficulties hitherto encountered have been overcome.

It is no doubt largely owing to the fact that esparto is infinitely more amenable to treatment than bamboo that we have not modified the process, even though there were indications of attaining greater economy and purity of product.

The object of fractional boiling is to remove members of the starch and pectose groups, before giving the more drastic treatment required by the lignins.

The dark color of "black liquor" from esparto boiling is caused by the presence of compounds of the first two groups. The solution of lignin is of a pale amber color. Thus when esparto is furnished into a boiler containing its full complement of caustic soda, the liquor immediately assumes a very dark color, indicative of rapid combination and ready solubility of the starch and pectose compounds and their associates.

Structure and Constituents of the Plants.

In order to appreciate the details in the process of esparto boiling, it is desirable that we should possess a certain knowledge of the morphology of the plant; this need not be extensive, but at least sufficient to enable us to understand the relationship which the non-cellulose constituents bear to one another, and to the cell wall or fiber, the desired requirement of the papermaker.

The synonomous expressions "non-cellulose" or "non-fibrous" are considered sufficiently comprehensive for the purpose of the papermaker, as they signify those constituents of the plant which must be removed before cellulose or fiber can be amenable to subsequent process treatment. These non-cellulose constituents are not by-products formed during the growth of the plant, but are significant of the progressive stages carried on in the digestive and productive systems of the plant; thus we find the early formation of starches and similar substances easily assimilated during active growth. Then follows further elaboration and the formation of more complex constituents, namely those of the second or pectose group, still closely related to the starches from which they have been derived.

Cell Walls or Cellulose.

The next step in the building up of the plant structure, brings us to the real object of interest from the papermaker's point of view. It is essential that the plant shall develop means whereby nourishment may be conveyed to the centres of growth, and that these highways shall possess strength and stability. To attain this object the pectoses become further elaborated and canals are constructed for the transport of nourishment. The walls surrounding these canals are extremely fragile, therefore, and, according to requirements, are proportionately impregnated with a strengthening and binding material, called lignin. The cell wall is the objective of the papermaker, and in order to obtain it in a pure condition he must remove those substances with which it is incorporated. In these remarks I have touched upon a subject of much interest, without attempting to enter into botanical detail.

Varying Proportions of Lignin.

In order to separate these non-cellulose constituents in the process of manufacture, certain degrees of treat-

*Read at Edinburgh meeting of the Technical Section of the Papermakers' Association of Great Britain and Ireland, September 21, 1921.

ment must be employed according to the facility with which each substance or group enters into combination with the boiling agent, and is dissolved by water.

It may be observed that according to the greater degree of stability required in a plant, there is a proportionate increase in the development of lignin. Plants which are of perennial growth requiring the maximum of stability, contain the maximum of lignin, which explains the more drastic treatment necessary for the separation of cellulose than is required by plants yielding annual crops.

If esparto grass is boiled in water, it will be observed that the liquid rapidly assumes a dark color, derived from the coloring matter of the plant, and certain intermediate compounds, also members of the starch group, are dissolved. The esparto becomes nearly black. The loss in weight on the air-dried material is approximately 12 percent.

If this water-treated esparto is now boiled in a solution of caustic soda containing 1 to 1.5 percent of the raw grass, the resultant liquor will assume a very dark coloration, and the esparto will be a pale yellow, somewhat higher than the raw grass. The loss in weight during this treatment will be about 25 percent. A total loss in the two digestions of about 37 percent.

Boiling With Weak Alkali.

The esparto obtained from the boiling with weak alkali, although light in color, feels hard and—in all respects except that of color — resembles a very much under-boiled stock. The reason for this is that the cellulose is still closely incorporated with lignin, upon which the weak alkali had no effect. As the cellulose and lignin obtained from this stage are highly resistant to chemical activity, it is necessary to apply the more severe treatment to which I have previously referred, in order to effect their separation.

The next boiling is with a solution of caustic soda containing about 12 percent sodium hydroxide to the weight of raw grass.

The boilings which were effective in removing the starches and pectoses can be conducted at atmospheric pressure. It is now interesting to observe that the third treatment, if carried out at ordinary pressure, has little or no effect beyond a slight softening of the grass. This affords an explanation of the fact that in the early days of esparto boiling an enormous excess of bleach was required. In short, the lignins were bleached out instead of being removed by the boiling process, and the color was not of a high degree of purity or permanence. I am not prepared to state that such conditions are not altogether uncommon today. Have we not heard it said by users of esparto papers, that the shade has "gone back"? It is certainly true that if lignins are only partially oxidized in the bleaching process, instead of being removed, they will, under suitable conditions of exposure, revert and cause degradation of shade. An increase of pressure above that of the atmosphere is essential for the purpose of raising the temperature to the point at which the resolution of the lignins becomes effective. The liquor from this stage of the process has a pale amber color, and the boiled esparto has lighter color than that usually associated with well-washed grass. There will be a further loss in weight of about 5 percent, thus the total losses resulting from the three stages are about 42 percent. It is interesting to note that while about 37 percent of the non-cellulose can be removed with weak alkali and at normal pressure, it is necessary to employ strong alkali and super-pressure in order to accomplish the resolution of 5 percent.

Three independent boilings have been given to the same quantity of esparto, and I think I hear some papermaker remark—"Such a ridiculous round-about process!" Wait a minute, my friend, you generally save time and petrol going round a hill, than by climbing over the summit in low gear." The foregoing description was the equivalent of a demonstration and we may now proceed to apply the process of fractional boiling to the manufacturing scale and method.

The fundamental feature of this process is the fact that the solution of lignin in caustic soda is practically colorless — and here I may mention that the blackness of "spent lye" is absolutely no indication of its strength or efficiency of work done. But the dark color of esparto after boiling by the usual system does establish that the stock has been boiled; but by the fractional method the grass at the corresponding stage is very pale in color.

In commencing this process, esparto is furnished into a boiler containing a solution of caustic soda having 1.5 percent sodium hydroxide to weight of raw grass, or 67 lb. dissolved in 1,700 gallons of water (equal to 0.4 percent solution) to a boiler of three tons capacity. The boiling is continued for about one hour, after which it is drained off. It will be observed that the liquor is of a very dark color, exactly like the ordinary strong "black lye." As this is only the beginning of the process, the liquor may be run to the drain; it is not worth recovery, and will not occur again. The starches and pectoses with their immediate derivatives have been removed, but the lignins are not affected.

Boiling caustic liquor containing about 14 percent sodium hydroxide to the weight of raw grass is now added; approximately equivalent to 941 lbs. dissolved in 1,700 gallons of water, and the boiling resumed at a gauge pressure of 35 to 40 lb. per square inch, equal to boiling point temperatures at 281 deg. to 287 deg. Fahr. for the duration of about three hours—according to grade or quality of esparto, and other contingencies. The liquor from this boiling is of a pale amber color, and as sufficient caustic soda was added to effect solution of the lignins and leave an excess it is available for the first boiling of another furnish of esparto in order to remove the starches and pectoses; thus the same quantity of caustic liquor is employed for both stages in fractional boiling.

The purer cellulose is, the greater affinity it possesses for coloring matter; thus we find under the usual method of boiling esparto that the highly colored liquor is extremely difficult to wash out, and more particularly so if cold water is employed, because it acts as a most effective mordant of the dark color obtained from the solution of the pectose group with which the hot boiled stock is impregnated in the customary all-in-one process.

Difficulty of Washing.

As a rule the difficulty of washing receives little or no consideration; it is taken as a matter of course that the boiled grass must be washed either in the boiler, or in the breaker, or both. The difficulty nevertheless exists.

The lignin which is held in close association with the cell wall in the capacity of a protective, binding and sizing agent, when dissolved by caustic soda, leaves the cellulose in a practically pure state. In presence of the soluble derivatives of the pectose groups, this degree of purity is short lived, as the property which pure unsized cellulose possesses for absorbing color immediately becomes effective, and the grass assumes the dark coloration characteristic of boiled esparto. The difficulty in washing is therefore coincident with the tenacity with which pure cellulose absorbs and retains the dye derived from another part of the process. Thus we are brought back to the statement which I previously made, that when

the all-in-one method of boiling is employed, one part of the process acts injuriously upon another. The color of unwashed boiled esparto treated by the fractional process has a decidedly better color than can be obtained by the very best conditions of washing under generally existing circumstances. If we remove those constituents of esparto which are the means of imparting color to the fully boiled material, we eradicate the greatest obstacle to economical bleaching.

It must be borne in mind that while the elimination of the members of the starch and pectose groups can be effected at atmospheric pressure, it is absolutely essential that pressures lower than that which will give a boiling temperature of 265 deg. Fahr. (approximately 138 deg. Cent.) are ineffective in yielding a boiled esparto free from lignin compounds. At this minimum temperature, equivalent to a guage pressure of 24 lbs. per square inch, the time required to effect even an incomplete solution would be increased beyond the limits economical process, if pressure is increased to give the boiling a temperature of approximately 280 deg. Fahr. (130 deg. Cent.) a most marked reduction in time can be accomplished, and fractional boiling will give better and more economical results than can be obtained by the all-in-one system.

In the usual method of esparto boiling, after the "black liquor" has been drained off to the recovery plant, the boiled stock is covered with water, and a second boil of short duration is given; this is for the purpose of removing residual black lye which may still adhere to the boiled esparto. It is customary to run this weak liquor to recovery. It may also be observed that this "scalding" or "first hot wash" is as dark in color as the strong "black lye."

When fractional boiling is adopted this part of the process can be practically eliminated. A relatively small proportion of boiling water may be run into the boiler through the perforated dome; this will be found to be extremely effective in removing most of the soda still adhering to the esparto. As this water after percolating through the mass has only a pale color, it can be satisfactorily used as a diluting water for strong caustic liquor. The total quantity of spent liquor which is sent for recovery is therefore reduced by nearly half, thus effecting a substantial reduction in recovery costs, without depreciation of the percentage of recovered soda.

Advantages Summarized.

The advantages of fractional boiling may be summarized as follows:

Early removal of the highly colored products of starch and pectose resolutions.

A much cleaner and more easily washed stock.

Greater economy in bleach, a better color and better permanence of color.

Reduction in cost of recovery.

I will not say anything about saving in caustic soda, because the majority of papermakers use more than is necessary under any and every system of boiling. I presume that this would also be the case if they adopted fractional boiling.

Disadvantages: I only know of one, which I will state frankly. The boiler is more difficult to furnish.

While the strong caustic soda employed in the usual process is chemically ineffective in causing resolution of the lignins at a temperature of the liquor during furnishing, it is a physical fact that a degree of loosening is accomplished, or, in the terms of the boilerman—"The bone of the grass is broken," so that it is capable of being stowed away and distributed with greater ease than can be done when a weak or partially exhausted liquor is used. This is the one and only disadvantage which I have experienced, but it is far more than counter-balanced by the advantages.

NEWSPRINT QUOTATIONS.

A newspaper despatch from New York reads as follows: price of $70 a ton recently announced by International Paper Co. for 1922 deliveries has been closely followed by majority of American and Canadian companies.

The following companies are now offering newsprint in rolls carload lots at $70 a ton for firstquarter of 1922: Canadian Export Paper Co., St. Maurice Paper Co., Ltd., subsidiary of Union Bag & Paper Corp.; Finch, Pruyn & Co., E. B. Eddy & Co., Ltd., Pejepscot Paper Co., Hanna Paper Corp., Interstate Pulp & Paper Corp., and F. C. Strype.

At the office of G. H. Mead Co. it was said 1922 prices had not yet been definitely decided upon.

Great Northern Paper Co., second largest producer in the United States, is offering contracts for entire year at $75 a ton.

Prices of spot newsprint have continued steady with paper offered by a New York manufacturer at $70 a ton. German, Finnish and Norwegian paper continues in the market slightly below the domestic price.

MATTAGAMI'S POSITION STATED BY COMMITTEE.

A despatch from New York says that Charles Hayden, chairman of the committee, representing holders of the 6 per cent 21-year first mortgage gold bonds of the Mattagami Pulp & Paper Co., Limited, has issued a notice that the comittee is prepared to advise bondholders not only in regard to their interests as bondholders but also as to the progress of the affairs of the company under its operation by receivers.

The comittee is not at present asking for the bonds, although depositaries have been selected both in New York and Canada. The committee states that the company's business has made progress with substantial reductions in operating costs and improved prices for the company's product under the direction of the receiver and the operating management. Other members of the committee are Sherwood Aldrich, Wilfrid M. Hager and Murray H. Toggeshall.

FACTS ABOUT CANADA.

Few people realize that 26,445 Canadian ex-service men have been established on the land and are nearly all making good; that Canada's water-power development represents an investment of $475,000,000, while the power produced would otherwise require 18,000,000 tons of coal yearly; or that nearly 88 per cent. of the world's supply of asbestos comes from the Province of Quebec. The Natural Resources Intelligence Branch of the Department of the Interior has just issued a revised edition of "Compact Facts," which contains in concise form information regarding Canada, its area, population, trade and industries; their extent, capital invested, wages paid, values of live stock, principal crops, and amounts produced; mineral resources and present production; also forest resources and forest products. Copies of the booklet are available on application to the Superintendent, Natural Resources Intelligence Branch, Department of the Interior, Ottawa.

PULP PRICES MUST INCREASE SAYS HALL CAINE.

In an interview with a representative of the Pulp and Paper Magazine, Mr. G. R. Hall Caine outlined his opinions on the present pulp and pulpwood situation. Mr. Hall Caine, who is the director in charge of the Canadian and American interests of Mr. F. E. R. Becker, of London, England, and also of the subsidiary companies on this side, is on one of his periodical visits to Canada and the United States. He has been here for about four months, the larger part of his time being spent in Montreal.

"I consider that the pulp business is now on a sound footing," said Mr. Hall Caine. "The cost of production is decreasing, and there is a tendency to put the manufacture of wood pulp on an economic basis. Up to now this year we have all been manufacturing and selling pulp at a price which cannot possibly continue, it meant ruination. When the cost of any article gets below the economic line, it must either go up or the article cease to exist. There is no question about the continuation of the pulp industry. After the natural reaction which occurred following the inflated prices in 1920, the pulp market is beginning to reassert itself. In my opinion, it is a good thing that this is taking place, both for consumer and producer. The great essential for the consumer is stability, and the sooner that we who produce and sell pulp—and paper for that matter—can assure the consumer that a stable point has been reached, the sooner will the pulp and paper business in Canada and in the entire world continue to make that natural progress which characterised the industry before the war.

"I predict that we shall see a materially higher price for pulp in 1923, if it does not occur in 1922. There is a logical reason for this. Our principal raw material is pulpwood. Practically every pulp and paper mill in Canada and Scandinavia is overstocked with wood, the result being that the mills are not going into the bush for any material stocks of wood during the winter of 1921-22. They will endeavour to live on their existing stocks, and it looks as if they will get their stocks down to beyond a reasonable point. The outcome will be that the companies will all have to undertake extensive bush operations in 1922-23. Last year we paid men in the woods $100 to $120 per month; now, owing to the limited demand for men, the price is from $25 to $30—which is simply a wage of necessity. This is not a proper level, and I think that in 1922-23 the rate will be $40 or $45 per month, because the demand will be larger, in consequence of heavier mill requirements. You will only find normality in the woods in the winter of 1923-24, when wages will be about $35 per month. In expressing my opinion, I have taken into account the farmer, because most of the companies employ the farmer to get the pulpwood. He will not go into the bush this winter, because there is lack of demand and because prices are low. The lumber position is somewhat similar in the matter of the cut.

"Those of us who have been running our business on sound lines have written down our stocks of wood to the replacement value of to-day. The result is that the wood now stands on our books at $14 and $15 per thousand feet. Therefore, the price of pulp to-day and the costs are based upon the written down value. Ground wood selling at $30 and sulphite at $51 or $52 per ton are based on the written down value of our raw material. The only thing that can happen etween now and the end of 1922 to improve the situation, will be a still further reduction in mill wages. There have been some reductions, but I do not anticipate a much larger cut. If, therefore, you set off possible reduction in mill wages against the increased cost of raw materials in 1923, the inevitable conclusion is that the price of pulp will be higher in 1923 than it is at present.

"The ratio of difference between the price of groundwood, unbleached sulphite and bleached sulphite is, in my opinion, on a wrong basis. The present mill prices are as follows:— Ground wood, $30; unbleached sulphite, $53; and bleached, $100 per ton. It does not cost more than $15 to $20 per ton to bleach sulphite. The result is that we ought to be getting $75 to $80 for unbleached—if the price of bleached is right at $100. The price of unbleached must come up. It is usually reckoned that, taken over a series of years, the proper price for unbleached is the price of newsprint, which is now from $70 to $75.

"Taking all these facts into consideration, I look forward with great confidence that from now on we may expect not only better and sounder prices for pulp, but a distinct revival in the pulp and paper industry both in the United States and Europe."

MAKE BARE ACRES WORK, SAYS BAKER.

Yonkers, N.Y., Dec. 9.—"It is my belief that New York should, as a state, purchase no more forest lands until we have put those which we now own to work in a satisfactory way," declared Dr. Hugh P. Baker, Vice-Chairman of the Forestry Committee of the Chamber of Commerce of the United States, and Secretary of the American Paper and Pulp Association, when he discussed the housing problem and the forests before the Yonkers Real Estate Board.

"We are all proud," he said, "of the barge canal, though it will not produce a revenue commensurate with the investment for many years to come, but if New York would spend half as much in replacing the forests on her idle forest lands as she has spent upon the canal we would in the course of a few years again have a forest that would help us to solve in a large way some of the serious problems now confronting us in the way of material for the building of homes and other buildings.

"We have as a state just completed the use of a bond issue of $10,000,000 for the purchase of forest lands, and another bond issue has been suggested for the purchase of additional land. The time has come when the state should first spend from twenty to thirty millions of dollars to reforest not only the land which it owns, but to assist the private owner in reforestation and protection of existing forests.

"We are spending over $30,000,000 a year to import the lumber from the South and the Pacific coast, 1,500 and 3,000 miles away, which could be produced in our own state.

"If the Chambers of Commerce throughout New York State could put themselves solidly back of a program of reforesting New York's forest wealth, they would bring a tremendous return not only to the state as a state, but to their own communities in the way of upbuilding industries, conserving water, and making the state a great playground for the people of our cities."

AN AUSTRALIAN VIEW OF PAPER TARIFF.

Canadian manufacturers of newsprint have expressed in no uncertain manner their dissatisfaction—to use a mild term—with the treatment received at the hands of the Australian Government in the matter of the tariff on newsprint. They assume discrimination against this country in favor of British papermakers, and an attempt by the latter to secure exclusive control of the Australian paper market. Canada bore a not inconsiderable share in the world war, and if any preference is to be given by Australia our manufacturers claim an equal share with the Mother Country. They see no reason why one part of the Empire—even if it be the Mother Land—should be favored at the expense of another, and if a preference is to be granted on patriotic grounds then Canada is equally entitled to that preference.

Mr. James Holland, the representative of British makers' who took a very prominent part in securing the preference for Great Britain, was last week in Montreal, on his way to Australasia, China and Japan. A representative of the Pulp and Paper Magazine interviewed Mr. Holland in order to obtain information as to the reasons why Great Britain secured the preference, to the exclusion of Canada. Mr. Holland explained the attitude taken by him on behalf of the British paper makers, and strongly denied any unfair descrimination against Canadian producers.

"By pure accident I was in Australia when the tariff was under discussion," said Mr. Holland. "As the representative of British manufacturers, I was naturally interested in the question. Our industry suffered tremendously during the war—as a nation we bore the heat and burden of the day—and I represented to members of the House of Representatives and the Senate that Great Britain was entitled, on these grounds, to some consideration. The Government proposal was to allow British newsprint free entry, and to impose an intermediate tariff of £2 per ton and a foreign tariff of £2 per ton. When the Bill was presented to the House of Representatives, the vote was in favor of British free, intermediate tariff £3 and foreign £3. The Senate however took another view, and recommended British free, intermediate £2 and foreign £2. The House of Representatives stuck to their proposals and on the matter being jointly considered by the two chambers, the Senate accepted the House of Representatives' proposal of British free, intermediate £3 and foreign £3.

"My original proposal to the Minister of Trade and Customs was British free, intermediate £4 and foreign £5. Canadian newsprint would have come in under the intermediate tariff. My proposal was aimed at Japan and at those foreign countries which were antagonistic to the Empire during the war. I had not the slightest idea of any discrimination against Canada. British manufacturers are satisfied to secure the share of trade which was held by foreigners, and to leave Canada undisturbed in the business she obtained. What the British makers expect to get is that trade which was in the hands of foreigners in pre-war days.

"I found in Australia a certain amount of soreness with what is termed here the American-Canadian combine, which it was alleged held up Australian consumers of newsprint during the war; and in my opinion, this feeling had something to do with the refusal to grant the alleged combine any preference. This is what I found.

"Even under the existing preference British manufacturers do not expect to get the whole of the business. The imports of newsprint into Australia total 50,000 long tons per annum, and if Great Britain secures 20,000 tons she will be more than satisfied. Furthermore, I claim that I was only asking for the Mother Country such terms as would allow her to recover from the effects imposed upon the paper trade by the war.

"I want to emphasise the point that I was fighting for the British manufacturer. I had no feeling against Canada, and in no way expressed views hostile to her manufacturers or her interests I was the representative of British interests—that was the only point from which I fought. I left other interests to put their own case before the Government."

SENATOR EDWARDS' ESTATE.

Ottawa, Dec. 9.—The estate of the date Senator W. C. Edwards, pioneer Ottawa lumberman, millowner and parliamentarian, is valued at $1,992,948.46, according to a statement issued yesterday by his solicitor. Application for probate will be made today. The entire estate is divided among members of his family and that of his widow. Mrs. Edwards is given a substantial life annuity.

More than half the entire estate consists of Dominion of Canada Victory bonds. The Senator died possessed of $1,020,93.83 worth. Hhis next greatest interest was in the Bathurst Company, Limited, Bathurst, N.B. He was the owner of 8,928 shares in this company, valued at $446.400

The statement values 1,000 shares of Riordon Company stock at $2,750.

The principal assets of the estate are: Dominion of Canada Victory loan, $1,020,093.83; 100 shares Bank of Commerce, $18,500; 1,537 shares Ottawa and Hull Power Company, $153,700; 8,928 shares Bathurst Company, Limited, Bathurst, N.B., $446,400; 2,700 shares Canada Cement Company, $152,550; 1,250 shares Woods Manufacturing Company, $87,500; 666 shares Babcock Carrier Florida Company, Punta Gorda, Florida, $33,330, and real estate at Mousseau Lake, Quebec, 12,203.

The Senator explained in his will that, owing to the large amount of succession duties which would be levied against his estate, and which he understood were utilized by the Government largely for the benefit of various charitable and benevolent institutions, he made no bequest to any charities, "such as I otherwise would have done," as his statement concludes. It is estimated that the province of Ontario will obtain about 20 per cent of the estate, or nearly $400,000.

BECKERS OPEN MONTREAL OFFICE.

The Becker Company of America, Limited, have opened offices at 164 St. James Street, Montreal, where they occupy an entire floor. This office will also take care of the various English and Canadian interests associated with the Becker Company. Mr. A. M. Irvine is a director of the Becker Company of America and the permanent representative in Montreal. It is not intended to make any change in the head office in Halifax, which is in charge of Mr. Harry I. Mathers, whose principal work is to look after the two pulp mills in Nova Scotia. It is probable that the Chicoutimi Pulp Company will open an office in the same building.

British Trade News

(From Our London Correspondent)

London, Dec. 2nd, 1921.

Trade with continental and other countries is so bad that in order to promote an export trade the British Government is urged by the Federation of British Industries, amongst other bodies, to consider the question of German reparations and the burdens imposed on former enemies. There are some people to-day who favor cutting them down by one-half, that Germany should pay to the extent of her capacity and that the Allies should even be prepared to lighten the evidence of the burden imposed upon Germany. It is really most remarkable the views held by a certain class of people on this reparations question. Some people soon forget that over 3 years ago we were in a war fighting for our existence. According to all accounts Germany is going on nicely and the French Premier's speech at Washington shows there is still some uneasiness about the "goings-on" in the "Fatherland."

"The Germans Don't Get Away With It."

In the "Pulp and Paper Magazine" for November 10th last it will be recollected that Mr. T. Lindsey Crossley, under the above headline, wrote a letter to the Editor giving some information about the smallest papermaking machine in the world, which was exhibited at the King Edward Hotel, in Toronto. The statements were made: (1) That Lord Northcliffe offered $25,000 for the machine; (2) That the machine was smuggled out of Germany into England; (3) That the machine was made in Germany. Mr. T. Lindsey Crossley contradicted these 3 points and he is correct. But let me tell the history of the little machine. After the papermaking machine had been made by Messrs. T. J. Marshall & Co., Ltd., of Campbell Works, London N., who are the well-known papermakers, engineers and specialists on dandyrolls and watermarking, previous to the war it was—some time about 1914 I am sure—sent to Germany for exhibition at the Leipzig exhibition. War broke out in August, 1914, and many people will remember the anxiety there was over exhibits at Leipzig—at least in London there was The papermaking machine, however, was stored in a museum and after the war was over Marshalls got it back through the British Clearing House. On its arrival in London an English firm purchased it and it was shipped to America, but to what place or firm in the U. S. A. I do not know. The next thing heard of the machine is its appearance at the Convention of the U. T. A. in Toronto. Lord Northcliffe never offered $25,000 for the machine, because he knew the value of it and he could get one very much cheaper from Marshall's. But it is very doubtful if a machine like the one seen at Toronto could be bought to-day for £300. Sometime ago Marshall's refused £540 for one—but another £10 added would have purchased it. That is their price to-day, according to what millmen tell me, and £550 is a long way short of $25,000 and considerably in advance of £300, which is a pre-war quotation. It would now be interesting to know who got the machine in America after the war ended. There is a good one here now in Marshall's and I am just as curious about its destination and buyer as I was about the 1914 machine.

Postage on Paper.

The Postmaster-General is again in "hot water" this week with the papermakers. Last week I mentioned that he refused to pass at a cheap rate samples of paper. Spicer Bros., Ltd., the papermakers of New Bridge St., London, have now received a letter from the Postal Authorities saying that "samples if enclosd with orders" should not be allowed to pass at the printed paper rate. Messrs. Spicers have already received 300 letters on the subject, so important is it to clients and others. They have now sent the following letter to the Postmaster-General: "As to the excuse that the printed paper rate is unremunerative, which is fallen back upon, after the previous excuse or reason that to alter the regulations would give dealers in papers an advantage over other traders had been proved to be fallacious, has the Postmaster-General data to prove the assertion to the satisfaction of any competent accountant outside a Government department? Even if he had there is surely sound business sense, particularly from the national point of view, to treat the carrying side of the Post Office business as a whole, and if the results as a whole are satisfactory, to reduce the charges in connection with matters that make for trade. If you judge weight by weight, the newspaper rate cannot be a paying proposition, but it would be folly from a national point of view not to throw in the swings with the roundabouts." The reply of the head of the P. O. will be interesting to this commonsense letter. From what one can gather the idea of the post office in order to make the department "pay" is to kill the system of sending out samples, failing this to make the unfortunate papermakers—with government interference hanging like a mill stone round their necks—pay full price rates, while the newspaper creeps through at the reduced rate. One is a sample of paper; the other is a sample of newspaper on its way to a subscriber.

Wall Paper Coy's Loss.

As I write the Wall Paper Manufacturers' deferred shares have fallen to 45d.-48d.(90 cents to 96 cents) on the deplorable results shown in the preliminary statement for the year ended August 31st last. There is a net loss of £919,246 against a net profit of £652,-977 for 1919-20. When all adjustments are made (£181,054 brought in, £100,000 from the contingencies fund and £109,846 from income-tax reserve fund no longer required) and after deducting the £28,659 paid as interim dividend on the preference shares, there is still a debit balance of £557,203. Last year the directors distributed the reserve fund of about £500,000 among the deferred shareholders in the form of a bonus. No doubt the company has suffered from the curtailment of building schemes in the country and from German competition on the continent where owing to the vagaries of the mark exchange, Germany has practically a monopoly of the wall-paper industry.

Finland Again.

I had some strong remarks to make last week concerning Finnish imports of paper into the British market and I notice that Mr. E. Percy Reed, of Albert E. Reed & Co., Ltd., and Mr. Joe. Dixon, of Peter Dixon & Son, Ltd., have contributed letters to the "World's Paper Trade Review" on the subject. These imports are undercutting the prices of the British output of paper owing to the depreciated exchange, and Mr. Reed mentions that his firm has had to cut prices in order to hold orders against Finland's competition. This is more evidence, I must point out, in favor of the Safeguarding of Industries Act and Mr. Joe. Dixon admits it. What I cannot understand is: Why do papermakers complain about unfair com-

petition when they have an Act to enable them to slap a 33 1-3 p.c. duty on Finnish paper. The dumped price of Finnish newsprint is about £20 a ton and the British is up to £22 and £23. And we have it from Mr. Reed that he is compelled to reduce his price to meet the Finnish price. The whole question is a most serious one and should not have been allowed to "hang fire" so long. The delay has meant that Finnish mills are running full time while the British machinery can hardly be fed on half-time. That is the position to-day. What was it in April last? Stanley Cousins, in his famous letter to the "Times" written at the end of May last, said: "British mill-owners, who realize the serious position of the industry, have reduced their contract prices to British consumers well below cost in an endeavor to keep our work people employed. . . ." If that was the position in April last before the Safe-Guarding Industries Act was introduced—and in which Mr. Stanley Cousins wanted all the paper trade included—what must the position be like to-day with Finnish newsprint coming into the market £3 a ton cheaper than the British product! Up to the present no announcement has been made that a case has been made out under the Act. Should there be one made out, the sooner the Board of Trade Committee get at it the better for the British mill men and his workpeople. There is no hiding the fact that mill men are fighting with their backs against the wall and they are entitled to expect that unfair competition be balanced by a temporary import duty and corrective exchange regulations. Indeed, there is no country in the world would stand what the British paper trade is enduring at present and the strange thing about the whole policy is that, in the interest of workers alone—not to mention manufacturers—no one will give a lead to put a "screw" on the cheap imports. It is well-known that where there is no profit coming in, there is no work, and, incidentally, I may mention, that some of the balance sheets of the mills here will be doubly interesting when they are issued. They will tell the story—the story of full running machinery on one side and half starved machinery on the other. Indeed, the story of failures already amongst the dealers is a lamentable one and the papermaker again comes in for his share of the losses.

Codified Customs.

Codified Paper Trade Customs have been raised and adopted by the British Papermakers Association, the wholesalers, merchants and other users. Here are a few samples:

(1) A machine-made printing paper ream is 500 sheets.

(2) A wrapping paper ream contains 480 sheets.

(3) A "mill" ream "Good" or "Retree" has 472 sheets.

(4) Complaints must be made in writing within 14 days.

(5) All disputes will be submitted to arbitration in the United Kingdom when they arise under a contract.

They are carefully drawn up under specific headlines in sections and these new codified customs should help to alleviate the many differences that often arise. I notice under the headline "Materials" the following: Unless it is otherwise expressly stipulated in the order, the papermaker shall be free to use his discretion in the selection of materials.

Preference for British Newsprint.

News has reached London that the tariff on newsprint admitted to Australia has been reduced. Of late things have been very erratic with papermakers here in regard to the Australian market and it is now felt that the preference given to newsprint will stimulate more trade. An interesting point now arises: Does the word British include Canadian newsprint? The policy after the war was trade within the Empire. (See page 1264).

Technical.

The Scotchmen have just opened their session, in connection with the Technical Section, at Aberdeen. Amongst the papers for the winter will be: Modern Methods of Evaporation for the Concentration and Recovery of Liquors"; the "Measurement of Temperature"; "Beating Problems"; "Transmission of Power in the Paper Mill"; "The Estimation of Starch in Paper"; "Timbers and Their Uses in the Paper Mill." These subjects will be dealt with by engineers, chemists, directors and others. Col. T. Davidson is chairman of the session.

Another Tariff.

The Belgians have increased their tariff on wall-papers, cardboard and other kinds of paper, particularly German paper, which, it is pointed out, is produced cheaper than what the Belgians could produce it. For some time past the paper and board industry of Belgium has been in a bad way and an attempt is now being made to get the mills going again. Consequently foreign imports are being singled out and the lesson is one that should interest the British mill men who are in the same plight as their confreres across the North Sea.

Forestry.

Forestry is an acute subject here at present. At the inaugural meeting in London of the Empire Forestry Association, which comes as an offspring of the Imperial Forestry Conference held in 1920, a resolution was moved by Lord Lovat urging the need for an extension of a constructive Empire forest policy and promising support to the Empire Forestry Association in its endeavors to stimulate the wider utilization of the many valuable commercial timbers of the Dominions, Colonies and Protectorates. The High Commissioner for Canada (Sir George Perley) in a neat little speech seconded the resolution and spoke of the desirability of an educational campaign which would teach people a proper system of forestry organization and development, and so enable the different parts of the Empire to grow valuable timber, especially on waste lands. The resolution was adopted.

The Pulp Market.

For the chemical pulps the demand is not brisk. There is, however, a slight improvement when compared with a month ago. For ground wood business is brighter and some good shipments have lately arrived from Canada. The dullness of the paper industry unfortunately is reflected in the pulp trade; but what is moving to-day keeps pulp sellers from becoming downhearted.

Prices are about as follows:—Sulphite £20; Easy Bleaching (No. 1) £14½; Sulphite Newsprint Quality (No. 1) £12; Unbleached Soda (No. 1) £11; Soda Kraft £11; Groundwood (wet) £4. 15s.; Groundwood (dry) £9.

The Australian new tariff may brighten up the paper trade. If it does pulp men may anticipate some business.

PULP AND PAPER NEWS

As these lines are being written, the case of the Ontario Government against the Shevlin-Clarke Company has been opened at Osgoode Hall, Toronto, before Mr. Justice Logie. The Crown is suing for the return of dues upon timbers alleged to have been illegally cut, or cut and not paid for, and for the cancellation of certain grants of timber areas. The timber in question grew on Berths 45 and 49 in Quetico Park, Ont. The Crown contends that 110,000,000 feet of pine timber was granted to the Shevlin-Clarke Company by the Hon. Howard Ferguson, then Minister of Lands and Forests, in 1919, and that the right to cut this timber was given without advertisement or tenders being called for, which is contrary to the rules and regulations of the department. The timber was sold to the defendant Company for $9 per 1,000 feet but, on behalf of the Government, evidence has been put in to show sales in Timagami running as high as $20 and $22 per 1,000 feet in the same year. An expert witness for the Crown describes the timber thus sold to the Shevlin-Clarke Company, which is the cause of dispute in the present action, as "the finest virgin pine I have ever seen." The case has been adjourned to the 27th of this month, and the judge, has intimated that it must be concluded within two weeks from that date. A great deal of interest is being taken in this case in pulp and paper circles in Ontario.

It is reported from Iroquois Falls that paper can now be shipped from the Abitibi Power & Paper Company's plant and be delivered in New York or Chicago in forty-eight hours. This is said to be the result of a system of car stations and efficient organization that keeps the Company in much better touch than formerly with its customers. It is also reported that the system of production has been considerably improved owing to keener work by the grinder men, and that a great saving has resulted from this, and a consequent reduction in the cost per ton of output.

There are no signs of any change in the situation with regard to the printers' strike in Toronto. Last week, the secretary of Local 91, International Typographical Union, received a message from the Indianapolis headquarters of the Union that the strike assessment upon printers at work would be reduced from ten to seven per cent. The reason for this reduction is stated to be that the revenue received from a ten per cent assessment amounted to $1,000,000 a month, which was $200,000 more than requisite to meet the strike pay of the printers on strike in various cities on the continent.

Mr. J. A. Bothwell, of the Brompton Pulp and Paper Company is, we regret to state, seriously ill. He has undergone an operation for appendicitis in the Sherbrooke Hospital.

Mr. Norman E. Wainwright has just returned from a trip to Australasia, which he visited in the interests of the Howard Smith Paper Mills, Limited, and the Provincial Paper Mills, Limited.

Next year the Dominion Forestry branch will resume the survey undertaken, two years ago, by the Commission of Conservation, of the forest and pulpwood resources of Ontario. This work, which was temporarily stopped by the abolition of the Commission in question, is greatly necessary on more grounds than one, and it is satisfactory to learn that it will not be allowed to drop.

One of the striking printers of Toronto, by name George Dawson, is seriously ill in St. Michael's Hospital, Toronto. Two other striking printers, out of twelve volunteers among them, were selected for an operation of transfusion of blood, which it was thought might save his life.

The Deseronto plant of the Dominion Match Factory was last year, purchased by the E. B. Eddy Company, of Hull, which concern has now assumed the management.

The reduction of ten per cent which, with the beginning of this month became effective in the freight rates of all railroads in Canada, will be greatly appreciated by pulp and paper concerns. Not only will paper and pulp be carried cheaper, but the benefit will also be felt as regards lumber, pulpwood, coal and other raw materials.

The extended groundwood plant of the Belgian Industrial Co. has reached a production of 246 tons per day. The aim of the staff is 275 tons.

Mr. Delraulx has bid "Adieu" to friends at Shawinigan Falls. Here's hoping he will have frequent occasion to return to Canada.

Mr. G. Meerbergen, who is well known as a keen advocate of, and untiring worker in the cause of Safety First has resigned from the Belgian Industrial Co. and will go into business in Belgium. He will be greatly missed by the Technical Section, of which he was truly an "active" member—Good luck, Gab!

Mr. H. Biermans, general manager of the Belgian Industrial Co. has returned from a business trip to Europe.

Mr. James Holland, representative of the paper mills controlled by Mr. F. E. R. Becker, of London, England, and whose work consists of travelling round the world arranging and visiting the various agencies, is now on a visit to Montreal. Mr. Holland has travelled nine times round the world.

The steamer "Drottningholm" sailing last week from New York for Sweden had on its passenger list a number of prominent paper men, among them I. W. Bowmall, vice president of the American Wood Pulp Corporation, accompanied by Mrs. Bowmall; Consul T. Lundgren, secretary of the Swedish Wood Pulp Association; G. Thunberg, of the firm of Olaf Wijk & Co.; N. Johanneson, of the Scandinavian American Trading Company; Ovar Hylin, of Lagerlof Trading Company, and E. Khilstedt of A. J. Pagel Company.

A postage stamp can be licked once; but after that it delivers the goods.

UNITED STATES NOTES

The MacSim Bar Paper Company, Otsego, Mich., will soon call for bids for construction of its proposed electric power plant for general paper mill service, to be 1-story, and estimated to cost $300,000. Billingham and Cobb are the architects.

With the passing of the Maine lumber trade in recent years before the steady encroachments of the pulp mills, the port of Bangor has declined so that it is now frequented only by steamboats and coal barges, where formerly the harbor was crowded by sailing vessels from all parts of the world, attracted there by one of the foremost lumber markets. While logs were sawed into lumber along the Penobscot River, Bangor's port prospered and the river hummed with the activities of numerous saw-mills. Then came the pulp mills and since their advent the log crop has been steadily diverted from the saws to the digesters and grinders, until to-day the pulp manufacturers not only use most of the log crop but also own most of the desirable timberlands, and save for those far up the State, along the lines of the railroads, sawmills are few and far between, and presently one will be a curiosity on this great river where once they stood in dozens.

Following a decision to re-open the general wage settlement determined upon last summer by the paper mill strike arbitration coommittee, hearings were begun last week before members of that body in New York City. The settlement last summer included an agreement that either side might reopen the case when the arbitration board was convinced that there was sufficient cause. The board has consented to reopen the case, and proof is being submitted at the hearings. Whatever the outcome may be, the changes will apply to all the companies bound by the arbitration decision.

Contending that the ship and paper machine building concern—the Pusey & Jones Company of Wilmington, Del.—is able to meet its current obligations, counsel for the corporation have asked the United Circuit Court of Appeals to revoke the appointment of receivers in equity. The case is being appealed from the order of District Judge Morris, of Delaware, appointing the receivers on a bill filed by Hans Karluf Hanssen, a representative of several Norwegian concerns, who had been sent to the United States to collect indebtness from Christoffer Hannevig, president of the Pusey & Jones Company. In part liquidation of the indebtedness, Mr. Hannevig gave Mr. Hanssen 7,200 shares of the company's stock, but when he failed to meet the remainder of the indebtedness, Mr. Hanssen filed the bill of equity averring the shipbuilding company was insolvent.

Manufacturing some ten thousand separate items, the Dennison Manufacturing Company of Framingham, Mass., has been able to keep running full time during the recent depression by producing large advance stocks of certain articles. At the present time part of the plant is being kept going turning out the 1923 stock of holiday cards, and other stock products are being made in other units of the plant that might otherwise be idle. Long time planning and storage compose one of the methods used to regulate the business of this company. The cost of storage and of capital tied up in products seems at first sight to be a heavy toll, but economically it is sound. The explanation is simple. If the company did not plan ahead and make investments in merchandise and in storage room it would have to make investments in machinery and buildings to handle the peak load of production. This would amount to more than the investment in goods and it would have the disadvantage of being a fixed investment rather than a quick asset. Instead of having its capital "frozen" in fixed investments it is expended in goods which are liquid. The factory which shuts down must lose both the overhead during the time of idleness and the profits which would have come had there been orders. Also it losses because of unused machinery. Many establishments are built to carry a peak load. During most of the year much of the machinery and space are not used. That is a heavy loss, a waste, which must be charged against the productive season.

The Federal Board for Vocational Education has begun its work of foreman training in the paper industry, starting with a course of instruction for employes at the plant of the Champion Fibre Company, Canton, N. C. Twenty sessions were held from November 7 to 19 under Frank Cushman, agent for the Federal Board. In the opinion of several of the Champion Company's executives, the course, while having shown no tangible results as yet, was well worth the time given up to it. The Vocational Board is planning to start similar classes in the paper making regions of New York and New England, extending them later to other sections of the country.

A new envelope contract whereby the public will be saved approximately $6,276,194, was announced by Post Master General W. H. Hays in his first annual report. This contract, made with the furnishers of stamped envelopes and newspaper wrappers was the result of a direct appeal of the postmaster general to the contractors for a re-adjustment of the prices. The contractor concurred in the opinion that there had been a substantial reduction in cost and that a cancellation was warranted, and entered into supplemental contract with the consequent saving mentioned.

Two billion feet of Alaskan pulpwood, the largest amount of National Forest timber ever offered for sale, is described in a prospectus recently issued by the United States Forest Service. The timber is within the Tongass National Forest, and covers about 90,000 acres with a frontage of 48 miles on navigable water, and 24 miles by boat from Juneau. Four-fifths of the timber is western hemlock and one-fifth Sitka spruce, both of which make excellent grades of paper, as has been demonstrated by the mills of Oregon and British Columbia. The sale period will be thirty years, and a large plant will be required to utilize all the timber within that time. The sales contract requires that a pulp manufacturing plant of not less than 100 tons daily capacity shall be established in Alaska by the purchaser within three years.

Photographic plates of paper are superior in many respects to those of glass.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 10th Dec.—The fact that, at last, the Dominion election campaign is over is regarded in pulp and paper circles as, in itself, a good thing. Despite the stimulus that so prolonged a campaign undoubtedly directly afforded to certain lines of the industry, on the whole it conduced to doubt and uncertainty, and hence to a certain measure of unsettlement, at a time when, in this industry as in others, any element of this nature is more than ordinarily undesirable. So far as the result of the election is concerned, one finds that the victory of the Liberals is received by paper men in this locality, if not exactly with enthusiasm, at any rate with an appreciable measure of equanimity. The general tenor of the comments to which the writer has listened from men prominent in the industry is to the effect that the Liberal majority, constituted as it is, will not be likely to take any steps, so far as tariff revision is concerned, which will be detrimental to Canadian pulp and paper interests. These interests, in the present stage of the industry's development in this country, have special difficulties of their own to which any revision of the tariff along well-considered and sagacious lines, is bound to pay adequate heed. The industry, in the space of a very few years, has become an important unit of Canada's industrial fabric. But it has not yet attained its full development. It has recently passed through a period of acute depression in a manner which has reflected great credit on itself and its leaders. In such circumstances, the time is not opportune to deprive it of the protection which is necessary if it is to continue its development unimpeded. And, on the whole, opinion in the industry distinctly inclines to the view that, in the revision of the tariff which doubtless will be, ere long, undertaken by the new Government which will be formed, steps such as to effect adversely the interests of an industry in such a special position are unlikely to be taken. This opinion is held with the more confidence inasmuch as the Liberals have a majority independent of the Progressives.

Pulp and paper men, in common with those engaged in most other manufacturing industries, did not, at any time, fear the handling of the tariff by the Liberals so much as by the Progressives. The really low tariff element of the new House of Commons will be confined, almost solely, to the ranks of the last-named party. And, as things are at present, while that party will, no dout, be able to make its influence felt, in various directions, on legislation, there is little reason to apprehend that it can force extremist fiscal courses on Parliament. In this connection, it is interesting to hear the satisfaction that is expressed that Quebec represents so large a proportion of the Liberal majority. Ontario manufacturers have not much in common with the French Canadian politicians in more than one direction, but, at least, they think that, on the whole, they are likely to show themselves a steadying influence in fiscal matters.

At any rate, so far as the pulp and paper industry is concerned, the result of the Dominion election has been received with a considerable measure of equanimity. It is felt that the industry, in the main, is well on the road to substantial general recovery and that nothing untoward, in the way of adverse tariff action on the part of the new Government, need be anticipated to retard that recovery.

PULP.—The market for pulp is not yet firmly established on a profitable basis for operators. The demand for bleached sulphite is pretty good, at prices around $90 a ton. News grade sulphite is also finding purchasers at about $60 a ton. But easy bleaching sulphite is not in very good demand. Groundwood pulp, for which between $26 and $28 a ton is being paid, is far from being in strong demand. The prices quoted above are at the mill.

NEWSPRINT.—Publishers are pleased at the reduction in the price of newsprint to $75 a ton and at the prospect that, in order to meet the pace which the International Paper Company is expected to set of 3½ cents a lb., it will have to come down yet $5 lower per ton. But the newsprint mills can hardly be expected to share in any jubilation at this. Indeed, the representative of one of such mills pointed out to the writer with emphasis that, as many mills hold heavy stocks of pulpwood bought at prices very different from those which pulpwood can command today, mills would be losing money by selling newsprint at $70 a ton. However, "needs must" when a certain personage drives and it looks very much as though it will be a case of "Hobson's choice." But it is rather a remarkable circumstance that some publishers seem to expect the price of newsprint to fall below the $70 figure before long. They point out that the ten per cent cut in freight rates should help to bring down the price, and in other lines of paper as well as in newsprint.

BOOK AND WRITING PAPERS.—The demand for most kinds of book and writing papers has been good, with orders coming in satisfactorily. It is possible that, with the Dominion election over, there may now be some slight falling-off in briskness, as the campaign made a heavy demand on certain lines. But it is expected that, with the New Year, a drive for more advertising is likely to occur and that this will result in an enhanced demand.

BOARD.—After recently giving so good an account of itself, the board market is not so active as it was. But jobbers seem hopeful of more activity in the early part of the New Year.

WRAPPING PAPERS.—The demand for wrapping papers continues good, but one hears, in connection with kraft, a recrudescence of the complaint against price-cutting, as to which a good deal has been said, from time to time, in this place.

TOILETS AND TISSUES.—Prices are firm in toilets and tissues and sales are fairly satisfactory, but not quite the same amount of briskness is in evidence in some lines.

As Montreal Sees It.

Montreal, December 12.—On the whole business in pulp and paper is satisfactory. Here and there reports are to be heard of a slackening in demand, but it is not

of a serious nature. It is perhaps only natural that after the recovery in trade there should be a slight setback in the paper industry at this period. If expressions of opinion are of any value, there is no danger of such a falling off in the volume of business and in prices as to cause alarm. The general opinion is that business will improve particularly as we now know the result of the elections. Parliamentary contests have generally speaking, an unsettling effect on commerce, and when the public is assured of a decision that fear is allayed.

The pulp market does not show any great activity, but is by no means dead. In another column will be found an interview with Mr. G. R. Hall Caine, who argues in favor of a stronger market in the future. He holds that the natural growth of pulp can only be assigned by higher prices, and that the conditions warrant an advance in values.

NEWSPRINT.—The International Paper Company has now made a definite announcement of its intention to charge $70 per ton for the first quarter of 1922. There was of course only one thing for Canadian mills to do if they wished to secure a large amount of business, and that was to meet the competition. This is being done. The I.P. Company has gone one better than the Canadian companies, and has forced prices lower than was looked for just now.

PULP.—There is a fair demand for all grades. This would be larger but for the fact that American buyers are making up their inventories, and as there is a tax on the stocks in hand, the inclination is to restrict purchasing for the time being. The Hawkesbury mill of the Riordon Company is again in operation. According to one company which deals largely in both groundwood and sulphite the tendency is firmer, and a still stronger demand may be looked for. Many Scandinavian mills are closed down owing to scarcity of water.

BOOK PAPERS.—Business is fairly good, with a favorable outlook for the future.

FINE PAPERS.—In this department there is not much inclination to buy pending the annual stocktaking.

WRAPPING PAPERS.—No complaint can be made on the score of orders, which are coming in at a satisfactory rate.

ROOFING PAPERS.—No. 1 saturating felt for patent roofing is quoted at $75 f.o.b. mill. There is a possibility of a slight reduction but this is not expected to stand for long; in fact the price may go up if the supply of raw materials does not improve.

RAGS and WASTE PAPER.—There is not a large reserve of rags for paper making, but prices are unchanged. The supply of waste paper is not sufficient to meet the requirements of mills in the vicinity of Montreal ,and some material has been imported from the States, making the price equivalent to the American price, plus freight.

NEW YORK MARKETS.

New York, December 10—(Special Correspondence)—The International Paper Company has officially announced a reduction of $10 a ton in the price of newsprint paper for deliveries commencing January 1, making a new contract price of $70 per ton f.o.b. mills for paper in standard rolls in carload lots. The price fixed for the coming year represents a drop of $60 a ton from the peak price prevailing in the last quarter of 1920 and the first quarter of the current year. Contracts will be made by the International on a price of 3.50 cents a pound for the full year 1922, or customers may elect to contract for six months' requirements at this price, with tonnage for the latter half of the year to be adjusted by agreement. In such an event the International guarantees that the price for the latter half of next year will not be in excess of 3.75c. or $75 a ton.

This cut in the price of newsprint by the leading domestic factor followed a reduction of $5 a ton announced by Canadian manufacturers, and was, as noted in this report last week, not unexpected in the trade. The fact that the I.P. states that this price will apply throughout 1922, however, leads the trade to believe that newsprint prices are finally readjusted, and opinion in paper circles is that there is not likely to be any further reduction in print paper prices. Since the I.P. announcement of a cut to $70, reports from Canada say that leading newsprint producers there have made a reduction to the same basis. The second largest producer in the United States is reported offering contracts for the entire year of 1922 at $75 per ton.

One of New York's daily afternoon newspapers yesterday printed an issue of 58 pages, carrying 343 columns of advertising printed. It is significant that this same newspaper boasts that since its last Government circulation report was printed, its circulation has increased more than 40,000 copies a day. If anyone doubts that consumption of newsprint is heavy at present, this single illustration should serve to convince him that at least as much, if not more, print paper is being used up day after day at present by United States' publishers than ever before. Pre-holiday advertising this year is exceptionally heavy, and newspaper publishers in New York and throughout the country are consuming record tonnages of paper.

Influenced by the cut in the contract basis, spot prices on newsprint have eased off slightly. Most domestic manufacturers continue to quote 4 cents, or $80 per ton, for spot deliveries, but many of them are taking orders at 3.50 to 3.75 cents, and this latter is about the prevailing market range at the moment. Imported newsprint continues to be offered at slightly under the domestic price, or in the vicinity of 3.25 cents per pound ex the dock.

Generally speaking, the paper market is quiet. Print paper is the exception, most other grades are in considerably less demand than a short time ago, and quotations in a good many instances evince a downward trend. Important buyers are operating cautiously; most of them are placing orders only when in direct need of paper, and it is plainly apparent on all sides that mills are in want of business. Book papers are gradually receding in price. Manufacturers are competing against each other to obtain orders and are repeatedly cutting prices to secure business. Machine finished book of good quality is available at 6 cents per pound f.o.b. New York and less, and some qualities of coated book are bringing no more than 8 cents f.o.b. this and other consuming centres.

Tissues and wrappings are, comparatively speaking, in fair demand. Consumers, however, are absorbing these grades of paper in limited amounts, and mill orders have fallen off in volume and number. Prices hold steady, with No. 1 domestic kraft wrapping quoted by mills at 6.75 to 7 cents a pound f.o.b. New York and No. 1 white tissue, basis 20 x 30, at around 90 cents a ream.

Fine papers are moving in moderate amounts and prices are about at unchanged levels. A reduction



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averaging between 10 and 12 per cent in prices on prepared roofing and asbestos shingles has been announced this week by leading manufacturers. Box boards continue easy and in slow demand. Most paper box manufacturers have about completed their Christmas orders and are holding back in purchasing board, as is usually the case toward the close of the year, and some mills are said to be so badly in need of business that they are closing down temporarily. Plain chip and filled news board are available at the same price, namely, $30 per ton for sidewalk delivery in New York, which means that most mills in New Jersey are obtaining no better than $25 a ton f.o.b their plants for board.

GROUND WOOD.—The wood pulp market at the moment lacks feature, and mechanical pulp is no exception from this condition. At the same time, ground wood is in fairly good demand. Newsprint mills are buying quite freely, and there is a large enough movement in other directions to give the market a moderately lively complexion. Prices are steady to firm and incline upwards, this being due presumably to the rather light stocks of ground wood at producing mills. Domestic grinders are quoting an average of $32 a ton f.o.b. pulp mill for prime spruce ground wood for prompt shipment, with prices ranging a couple of dollars per ton on either side of this point. Some foreign ground wood is offered on the spot in this country at approximately the same price domestic producers ask or a trifle higher.

CHEMICAL PULP.—A strictly seasonal condition exists in the chemical pulp market. With paper manufacturers preparing to take inventories and therefore endeavoring to reduce stocks of raw material, buying is almost solely against immediate requirements, with the result business is principally of retail character. Nevertheless quotations are well maintained. Bleached sulphite is firmly held by domestic producers at from 5 cents upward for No. 1 quality bleached, and importers are asking 4.50 cents and higher for foreign bleached No. 1 grade. Easy bleaching sulphite is firm at between 3.50 and 3.75 cents a pound, and news grade sulphite is selling at around 2.75 cents a pound at pulp mills. Kraft pulp is in comparatively steady demand and prices are holding. Domestic No. 1 kraft is bringing 3 cents at producing mills for strong pulp, and around 2.75 cents for secondary grades. Scandinavian kraft is quoted at around 2.75 cents on the dock. Advancing rates of exchange on European countries cause quotations on foreign pulps to exhibit a stronger tone.

RAGS.—There has been no improvement in the paper-making rag situation in New York this week. The market continues dull. Paper mills are coming into view as buyers only when actually and immediately in need of rags, and even then they are offering low prices which serve to dishearten dealers. Mills in a majority of cases appear simply not to want rags, regardless of the prices at which they can buy, and there is of course an easy tone to values under such circumstances.

Roofing rags have moved down further in prices. Sales of No. 2 satinets to felt paper mills have been noted at 80 cents per hundred pounds f.o.b. New York, while cloth strippings have sold down to 1.05 cents a pound New York. Old whites and blues are in very slow demand, and new cuttings of most kinds are neglected by buyers. Prices are largely nominal, and those quoted by dealers mean little because buyers can doubtless do better should they make firm bids at lower levels.

PAPER STOCK.—Some grades of old paper have again declined, notably the better grades of paper stock, whereas others hold at about previous quotation-levels. Old kraft paper has sold this week at 1.60 cents per pound f.o.b. New York, denoting a drop of some $4 or $5 per ton, and white blank news cuttings are down to 1.70 cents New York. The fact that news cuttings are fetching higher prices at present, because usually the reverse is true. White shavings are quoted by local dealers at around 3.75 cents per pound New York for No. 1 hard and 3 cents for No. 1 soft shavings. Old books and magazines are selling at 1.20 cents New York, folded newspapers at 50 to 55 cents a hundred pounds, and No. 1 old mixed paper at 37 ½ to 40 cents a hundred pounds.

OLD ROPE AND BAGGING.—Old Manila rope continues in fair demand from paper mills and is bringing an average of 4.75 cents a pound at shipping points for No. 1 rope. Old bagging is not wanted by consumers and is purely nominal in price. No. 1 scrap bagging is readily available to mills at 85 cents a hundred pounds f.o.b. dealers' points but there are few or no buyers in sight at this or lower figures.

GOVERNMENT LUMBER CAMP.

S.S. Marie, Ont.—Dec. 13.—A permanent lumber camp is being opened up at Mile 149 on the Algoma Central by the Ontario Government under the supervision of S. W. Butt, superintendent of bridge construction from Sudbury North. It is proposed to take out for Government needs 250,000 feet of timber this year, and portable mills are being installed.

Switzerland is electrifying her railways to save importing coal.

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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. **GARDENVALE, P.Q., December 22, 1921.** **No. 51**

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-3 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

Subscription to any address in Canada, United States and British Empire, $5.00 yearly. Other Countries Postage Extra. Single copies, 15 cents.

Changes of advertisements should be in the Publishers' hands ten days before the date of issue.

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THE FIRST CHRISTMAS

Nineteen hundred and twenty years ago, "Joseph went up from Galilee, out of the city of Nazareth, into Judea, unto the city of David, which is called Bethlehem; (because he was of the house and lineage of David) to be taxed with Mary, his espoused wife, being great with child. And she brought forth her firstborn son, and wrapped him in swaddling clothes, and laid him in a manger; because there was no room for them in the inn.

"And there were in the same country shepherds abiding in the field, keeping watch over their flock by night. And, lo, the angel of the Lord came upon them, and the glory of the Lord shone round about them; and they were sore afraid. And the angel said unto them, 'Fear not: for, behold, I bring you good tidings of great joy, which shall be to all people. For unto you is born this day in the city of David a Saviour, which is Christ the Lord. And this shall be a sign unto you: Ye shall find the babe wrapped in swaddling clothes, lying in a manger.' And suddenly there was with the angel a multitude of the heavenly host praising God, and saying, 'Glory to God in the highest, and on earth peace, good will toward men.' "

And now after centuries have passed, the world is really just beginning to appreciate and apply the message that this child came to bring. The road has been rough and weary and progress has been marked with many a disaster and many a discouragement. Perfect peace has by no means yet been achieved, but the promise is beginning to be realized that peace will come when men are of good will. There is no doubt that the majority of men are of that class and the leaders of the great nations of the world are now bending their best efforts to bring about the establishment of that happy state of affairs which was promised so long ago.

There is still much distress in the world and an unfortunately large part of it lies close to us. So, in wishing our friends and readers a very Merry Christmas, we add the hope that each of us may be the means of brightening the day for someone else less fortunately situated.

Manufacture of Coated Paper

By Wm. T. SCHENCK, Champion Coated Paper Co., Hamilton.

I have been in the coated paper business for about 27 years, and have seen many changes in its manufacture in that time. If we were to go back to the ways of 20 or 25 years ago, we would soon go out of business. The "coating game," like every other business, never ceases to improve.

We will have a little discussion on the manufacture of coated papers.

The first thing to bear in mind is that the manufacture of coated papers is an art from beginning to end, but we very often forget this. The fundamental thing in making good coated papers is this: The raw stock must be made just right for each grade. We must not forget that we are going to make something artistic out of this raw stock. Its requirements are mostly—good formation uniform weight, free from fuzz, and the proper uniform colour. Starting with this, we are on the right track to begin this work of "art going."

Mixing The Coating Materials.

Then comes the mixing of the coating and tinting, etc. The colour mixer must know how to properly mix his coating materials, and get them uniform, or we are going to turn out a very poor lot of paper, even if all the other conditions in the process are good.

We next come to the coating machines. The machine runner must positively know how to apply this coating material to the best advantage, and see to it that it is properly coated, as well as uniformly, and must be an artist in his line, as this is one of the important steps in the manufacture of coated papers. Of course, the different mills have many different methods of doing things, and many are the small things that the coater man does to make an artistic sheet. Our method with the men has always been to try to impress upon them the fact that this is a "work of art," and that they are not ordinary workmen, but artists. One cannot be too emphatic with the work on the coating machines; it takes skill.

The next step is drying and reeling, which is mostly mechanical—then comes the finishing of the paper. It is run through super-calenders—you all know what they are—here is where the **real** artist gets in his **reel** work; he can either make or mar at this point. A good calender-man must be able to tell at a glance, or by the "feel" of the sheet as it is going through the calender, if it is all right, or not; he must be on the "look-out" at all times and watch how "she is calendering;" also, the trained eye can detect a spot on the sheet while it is running. The calender-man must also watch closely for any change in the moisture of the sheet running, in order that it is not "crushed" or "blackened." In fact, this part of the operation is one of the very important ones, and the greatest care must be taken at this point. The finish and pressure on these machines should always be established by the foreman, and the calender-man should be given a sheet by which to run; if he is a good man, he will closely follow the sample.

Then comes the cutting-off process, most of the paper is laid off by mechanical means. All coated papers are sorted one sheet at a time and all defective paper taken out. Now, right here is where we are all weak; that is, all coating mills must rely upon the judgment of the sorters—and here is where one has the human element with which to contend. The sorters are supposed to take out all the bad paper, but—do they? We have established a very thorough way of inspection, but at that, some defective papers will slip in, and here is where we "get in bad" with the printer.

The Finish of the Paper.

Right here is where I would like to go on record about these different grades of papers. I have talked with many printers on this subject, and had quite an argument with that bunch of printers at Chicago, in regard to the present highly finished surface, and they all agreed with me that a semi-dull velvet finish was much more to the point, and that it enabled the printer to bring out the fine half-tones, and make an artistic job of it. They get much better results with the semi-dull than with the very high glossy finished papers. papers. It is impossible to get an extremely high gloss without destroying the surface for printing—that is, for good printing. A more or less crushed and hard sheet is the result—the ink will not dry, and the colour of the cut will show grey and blurred instead of clean and sharp. Of course, the dull finish will require a little more ink, but it will be well paid for in the results obtained.

High Glossy Surface Papers

I feel that in the near future, the bulk of coated papers will be made dull finish or semi-dull and the high glossy surface will gradually disappear. A dull surface on coated papers is much more difficult to manufacture than the high finish, as the printing surface must at all times be smooth, in order to get good printed results. I find that since my meeting with the Chicago printers last fall, that our business on dull coated papers has more than doubled; in fact, "it seems to be the go."

I would like to quote here an article from our Year Book of June, 1920, by Mr. P. J. Massey, Superintendent of W. F. Hall Printing Company, Chicago. He says:

"I would like to ask, why do paper makers exert so much effort and time, with the attending necessary waste, to get an excessively high finish and mirrored surface on their papers? I am sure that every press room executive present will agree with me when I say that you are not fulfilling the press room requirements by so doing, but that you increase their troubles, in addition to destroying the eye-sight of the general public."

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*Read at Spring convention of the American Pulp and Paper Mill Superintendents Association.

Reports from various International Paper Company mills indicate that working forces are almost up to normal size and that near capacity production has been reached in practically all of the plants. It is claimed that many of the men who went out on strike last May have returned and that the new men filling vacancies left by those who remained out have been filling the places acceptably.

Thiocyanates as Solvents for Cellulose

By H. E. WILLIAMS.

It has been known for some time that a concentrated solution of zinc chloride or of mercuric-barium iodide will dissolve cellulose, and Deming (J. Amer. Chem. Soc., 1911, xxxiii 1515) has shown that cellulose will dissolve in solutions of certain metallic chlorides strongly acidified with hydrochloric acid; in the latter case the cellulose is profoundly modified by the hydrolytic action of the acid before solution takes place.

Dubosc (Bull. Soc. Ind. Rouen, 1905, 318) first noticed the action of certain thiocyanates on cellulose, and states that solutions of ammonium and potassium thiocyanates dissolve cellulose, forming a cellulose thiocyanic ester. P. Weimarn (G. P. 27,882) claimed the action of the solution of any neutral salt on cellulose—the term action being here used in its widest sense. No technical developments followed from these observations.

The subject matter of this paper is the outcome of work carried out some years ago (1907-8) on the properties of the metallic thiocyanates.

Several years later (1916), although the author was unaware at the time of the work of the investigators mentioned above, his attention was directed to his previous observations in a systematic study of the concentrated solutions of metallic thiocyanates, and it was found that a number of these solutions (e.g., of strontium, magnesium, manganese, lithium, etc., thiocyanates) when heated were capable of dissolving cellulose.

Nature of the Solutions Used.

These results were then subjected to a critical examination, and a theory of the action of these solutions on cellulose was evolved by means of which it is possible to predict the action in terms of definite physical constants, a detailed description of which has been given elsewhere (Manchester Lit. and Phil. Soc., Apr. 12, 1921) and will shortly be published. It will suffice here to state that the results of the work demonstrated that to dissolve cellulose, a concentrated aqueous solution of neutral or acid salt must consist of a liquid hydrate—an associated molecular complex of salt and water—which must have a viscosity above a certain minimum and a positive heat of dilution between certain well-defined limits.

By the aid of this knowledge it was possible to make any of the thiocyanate solutions dissolve cellulose, either singly or in admixture with one or more other thiocyanates. For example, sodium thiocyanate solution is not a cellulose solvent at any concentration under atmospheric pressure, the viscosity of its most concentrated solution falling below the minimum required. As this salt solution has a positive heat of dilution when concentrated, it follows that additions which increase its viscosity but which do not reduce its heat of dilution will render the solution capable of dissolving cellulose. This result may be accomplished by the addition of sufficient manganese, aluminum, zinc, or other thiocyanate, the two latter not being of themselves solvents for cellulose. The same result may also be obtained by dissolving in the solution the insoluble or sparingly soluble thiocyanates, such as the mercuric, cuprous, cadmium, silver, or lead salts.

The possible industrial applications of these observations include the spinning of filaments, mercerization of cotton fabrics, parchmentization of paper, and the preparation of "vulcanized" fiber.

Of all the cellulose solvents examined, the concentrated solution of the calcium thiocyanate has the most profound and far-reaching effects, and as it has the further industrial advantage of having a cheap base, it is the one that has been most closely studied from the industrial standpoint.

Solutions Must be Neutral or Acid.

As mentioned above, cellulose is soluble in the concentrated thiocyanate solution only if neutral or acid, careful investigation having shown that if the solution is alkaline, no solution of cellulose takes place. This result has been found to be true for all the thiocyanate solutions. Calcium hydroxide dissolves in calcium thiocyanate solution in increasing amounts as the concentration of the thiocyanate rises, and a solution containing 2 Gm. or more of calcium hydroxide per 100 Cc. may be obtained. The alkali may be neutralized by careful addition of dilute sulphuric acid, or by diluting the solution to a specific gravity of 1.2, when practically the whole of the hydroxide will be precipitated in the free state, and the solution may be filtered and re-concentrated.

A solution of calcium thiocyanate of such a concentration that it boils between 135° and 150° Cent. will dissolve bleached cotton or chemical woodpulp when heated to 80° to 100° Cent. The fiber first swells and then gradually passes into colloidal solution, no trace of the original fiber being visible when a drop of the solution is examined under a microscope; on cooling, the mass sets to a clear firm jelly. That a solution boiling below 133° Cent. or one boiling above 150° Cent. will not dissolve cellulose may be easily demonstrated by adding a few fibers of chemical woodpulp to a neutral solution of the thiocyanate boiling, say, at 110° to 115° Cent. and allowing the mixture to boil slowly on a sand bath; it will be noticed that, apart from some swelling action, no solution of the cellulose takes place as the temperature of the boiling point rises during concentration until it reaches 133° to 134° Cent. when the fibers pass into solution in a few seconds. If the thiocyanate solution is further concentrated and the cellulose then added, it will be noticed that solution of the cellulose becomes more and more difficult, and when added to a solution boiling at 150° Cent., or over, no cellulose passes into solution, although the fiber is strongly parchmentized and swollen.

Theory of Hydration.

This retardation of solution ending in complete stoppage, is not due to the increased viscosity of the solution, which would naturally retard the rate at which the cellulose dissolves, but to a more deeply seated cause. In a solution of a very soluble salt with a positive heat of dilution, as the amount of total solids increases on concentration, the remaining water must be

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*Presented at the annual meeting, at McGill University, Montreal, of the Society of Chemical Industry. Reprinted from the Journal of the Society, Oct. 15, 1921.

held by the salt with greater and greater affinity. If therefore, such a solution will bring about a chemical reaction between another compound and water, it is obvious that as the concentration of the solution increases, the salt will tend to hold the water in a stronger union, and thus retard more and more the desired hydrating action. A point may therefore be reached where the affinity of the water for the salt is so great as to transform any hydrating action into a dehydrating one. This point appears to be reached in the hydration of cellulose by calcium thiocyanate when the concentration of the solution rises to the point at which the b.p. is 150° Cent. and over. The addition to such a boiling solution containing cellulose of a few drops of water sufficient to lower the boiling point to 148° to 149° Cent. will cause solution of the cellulose in a few seconds.

When cellulose is dissolved in the neutral calcium thiocyanate solution boiling between 133° and 140° Cent. the fibers first swell enormously, the whole mixture becoming intensely thick and gelatinous, and very difficult to stir if the proportion of cellulose is 3½ to 4 Gm. or more per 100 Cc. of solution, but on further heating the mixture gradually melts down to a thick fluid. The addition of a weak acid such as glacial acetic acid, in the proportion of 2 to 4 Gm. per 100 Cc. of solution, enables the cellulose to dissolve without passing through this intense gelatinous stage, and the mixture may be easily stirred during solution. By this means solutions of 10 to 12 Gm. of cellulose per 100 Cc. of solution may be as easily and readily made as those of lower strength.

For the preparation of a concentrated solution of cellulose the most suitable calcium thiocyanate solution is one which boils at 134° Cent., or slightly over, but not exceeding 140° Cent.; 3 to 4 Cc. of glacial acetic acid per 100 Cc. of solution is then added, followed by 5 to 10 Gm. of cellulose according to the strength of the solution required, and the mixture allowed to stand until fibers become thoroughly wetted and impregnated with the solution. The mixture is then heated to 100° Cent. and maintained at that temperature until the fibers become separated and highly swollen, and the whole liquid thickly fluid. The temperature is then raised to 110° to 120° Cent. and the mixture stirred until solution results. The temperature should not be allowed to rise much higher or the solution may become distinctly brown in color.

A portion of the calcium thiocyanate solution may be replaced by a solution of certain salts which do not react chemically with it, but maintain its boiling point and other necessary properties, without altering the solvent properties of the solution for cellulose. Such a solution of mixed salts will, so far as present experience goes, serve the same purpose as a cellulose solvent as the pure calcium thiocyanate solution.

There are but few salts capable of fulfilling this function, for such a salt must have high solubility in water, high boiling point in concentrated solution (over 133° Cent.), it must be viscous and have a positive, but not too great heat of dilution, and it must not act chemically on the calcium thiocyanate.

These properties and conditions are fulfilled to an admirable extent by calcium chloride, which further has the advantage of cheapness. A solution of this salt boiling at 133° Cent. may be mixed with calcium thiocyanate solution boiling at 133° Cent. in the proportion of one volume of calcium chloride solution to two volumes of calcium thiocyanate, without in any way interfering with the properties of the calcium thiocyanate solution for dissolving cellulose. The same maximum amount of cellulose may be dissolved in the mixed solution, whether neutral or acidified, with equal ease. A larger proportion of calcium chloride solution cannot be employed when working with solutions of the concentration mentioned above, without the viscosity of the mixed solutions falling below the minimum necessary for a cellulose solvent.

If, however, both the solutions are concentrated until the boiling point rises to 140° Cent. under normal pressure, equal volumes of calcium chloride and calcium thiocyanate solutions may be used. This mixture will be found to dissolve the same maximum amount of cellulose and with the same ease as the original pure calcium thiocyanate solution boiling at 133° Cent.; in fact, in some respects it is superior. The substitution of greater amounts of the calcium thiocyanate solution by calcium chloride solution has not been attended with success, and conclusions based on theoretical considerations render it unlikely that the substitution can take place to any great extent, since the heat of dilution of the mixed solutions is too great.

A solution of cellulose in the calcium chloride-thiocyanate solution prepared as above described, containing about 7 Gm. of cotton or wood cellulose per 100 Cc., and kept warm, may be spun through a fine orifice for the preparation of cellulose filaments. The best precipitating medium for spun threads so far found is to dilute alcohol (50 to 90% C_2H_5OH). The precipitated filament, which is firm and easily handled, may be washed and dried in the usual manner, yielding threads which are strong and lustrous.

In the methods described above, the cellulose dissolves in the thiocyanate solutions only on heating, but C. F. Cross, F.R.S., who has taken a deep interest in the results of the work, has made the interesting observation that solution of the cellulose may be effected in the cold by the following method. Chemical woodpulp is allowed to soak for some hours in the cold in a mixture of four parts of calcium thiocyanate solution of sp. gr. 1.38, and one part by volume of 40 per cent formaldehyde. The fiber swells in the mixture, and no other apparent change takes place, but when the solution is diluted with an equal volume of cold water, the cellulose rapidly passes into solution. If the original mixture, after standing but before dilution, is gently warmed, and small quantities of water are gradualy added, it becomes thicker and thicker until finally all the cellulose passes into solution. Solutions containing up to 4 percent of cellulose have been obtained in this manner.

As similar results may be obtained by using solutions of zinc chloride, strontium thiocyanate; or lithium thiocyanate, etc., of appropriate strength, mixed with 25 percent of 40 percent formaldehyde, it would appear probable that the reaction is a general one. The partial substitution of calcium chloride solution for the calcium thiocyanate in the formaldehyde mixture has a retarding effect, probably due to its powerful dehydrating action.

If the thiocyanate solution is diluted with the same amount of water in place of the formaldehyde solution, no apparent effect is observed and no solution of the cellulose takes place on dilution.

The addition of the formaldehyde to the thiocyanate solution lowers the surface tension, but does not materially lower the viscosity or the heat of dilution of the mixture; the addition of water, however, while hardly altering the surface tension, considerably lowers the viscosity and the heat of dilution.

If the cellulose is soaked for some hours in calcium thiocyanate solution of b.p. 134° Cent., and water is then added to bring the sp. gr. to 1.26 (b.p. 115° Cent.), solution of the cellulose occurs on heating to 60° to 70° Cent.

A careful examination of the action of calcium thiocyanate in the cold on chemical woodpulp has shown that whereas no cellulose passes into solution when digested either with very dilute or very concentrated thiocyanate, traces are dissolved in the slightly less concentrated solutions, rising to a maximum of about 0.5 percent of the added cellulose in the solution of sp. gr. 1.3 and gradually falling to zero in the weaker solutions.

If the thiocyanate is diluted with varying amounts of formaldehyde in place of the water, gradually increasing quantities of cellulose are dissolved on the addition of water, rising to a maximum of 100 per cent and then rapidly falling off to zero. The curve expressing the percentage of cellulose dissolved for each dilution of the thiocyanate solution with formaldehyde reaches its maximum at the same point as the thiocyanate-water curve.

If chemical woodpulp be worked in a beater for twenty-four hours with the cold thiocyanate solution of sp. gr. 1.3 (b.p. 120° Cent.) a considerable portion of the cellulose may be found in solution after filtration. The remainder of the fiber passes into apparent solution on heating to 60° Cent., setting to a firm jelly on cooling. There is still some doubt as to whether this jelly is a true colloidal solution, as although the fibers are invisible under the microscope in the warm solution, they appear to be faintly outlined in the cold solution as enormously swollen, and distinct evidence of fiber structure may be perceived in the precipitate obtained on dilution.

Parchmentizing Action.

If unsized paper is passed through a solution of calcium thiocyanate, or better the 50/50 calcium chloride-thiocyanate solution concentrated until the boiling point rises to 155° to 157° Cent., and cooled to 130° Cent., an excellent parchment paper or vegetable parchment results. The paper should be preferably of open web and a good absorbent, and is passed through the bath at such a rate that it is in contact with the hot liquid for not less than 30 secs., then washed in running water and dried over steam-heated rollers.

A weaker thiocyanate bath, which would be a cellulose solvent, obviously cannot be used with any great success for the preparation of parchment paper. It will partially dissolve the cellulose on the surface of the paper; on washing the paper the light flocculent film of cellulose hydrate on the surface of the sheet will be removed by the water before precipitation of the gel occurs, thereby causing loss. On drying a paper so treated and washed, the precipitated cellulose hydrate will shrink considerably, crack, and expose some of the untreated fibers underneath, and thus the paper will not be rendered air and grease proof.

At the same time it is only permissible to attack the surface of the paper, for otherwise it would become too soft to handle in the washing operations, and would dissolve or disintegrate on more prolonged treatment in the baths. It is therefore perferable that the parchmentizing solution should not be a solvent for cellulose, and such a solution is obtained by concentrating the calcium thiocyanate-chloride solution to a boiling point of 155° Cent.

From a large number of experiments it has been found that the temperature at which such a solution has the most marked parchmentizing effect is 130° to 135° Cent., though it may be varied from 125° to 140° Cent., with but little effect.

At the present time parchment paper is manufactured by passing unsized cotton rag paper through a bath of sulphuric acid (sp. gr. 1.7) maintained at 10 deg. Cent. The paper must be passed through the solution at such a rate that it is not in contact with the acid for more than about ten seconds; the temperature of the bath must not be allowed to rise above 10 deg. to 15 deg. Cent., and the paper must be very rapidly washed. If the temperature of the bath is allowed to rise, or the paper kept in contact with the acid for more than about fifteen seconds before washing, the action of the acid becomes so great that the paper partially dissolves, becomes soft, and cannot be handled in the washing operation.

The use of the calcium chloride-thiocyanate bath, prepared as above, for parchmentizing, has the advantage that the time of contact with the parchmentizing bath may be prolonged, and the temperature may be carried between wide limits; also the washing operation may be delayed for any length of time without damage resulting.

Again, sulphuric acid chars and blackens ligno-cellulose and can therefore only be used to parchmentize pure cellulose paper; but any class of unsized paper may be parchmentized with the thiocyanate solution, whether it consists of pure cotton rag, or contains lignocellulose, such as mechanical woodpulp or jute, etc. The process may therefore be used for parchmentizing and at the same time strengthening wrapping paper, jute halfstuff, etc.

It is, of course, necessary to recover the chemicals carried over by the paper from the parchmentizing bath. The amount of liquid carried over into the washing plant is very considerable; experiment has shown that after passing the squeezing rollers, whether sulphuric acid or the calcium chloride-thiocyanate solution is used, the amount is roughly 4 to 5 times the weight of the paper used.

In the sulphuric acid process the paper, after leaving the parchmentizing bath, must be plunged as quickly as possible into an excess of cold dilute acid to stop the action of the strong acid on the paper. This difficulty does not arise with the thiocyanate process, as the paper after leaving the parchmentizing bath may be washed on the complete counter-current principle, with the recovery of 95 percent of the solution at a concentration of 1.33 sp. gr. (i.e., half the concentration of the original parchmentizing bath).

J. Huebner, of the Manchester College of Technology, has experimented with paper after parchmentizing with the calcium chloride-thiocyanate solution, by exposing it to the action of various vapors for different lengths of time; considerable improvement was obtained in the strength of the paper. The bursting strain of the original paper was 8 lb., or if washed immediately after parchmentizing in the usual manner, 35 lb. After ex-

posure to the atmosphere for 3 hrs. the bursting strain was 52 lb.; 5 hrs., 51 lb., 20 hrs., 55 lb., 2 days, 62 lb., 7 days, 60 lb. After exposure to ethyl alcohol vapor for 3 hours the bursting strain was 33 lb.; 5 hrs., 48 lb.; 20 hrs., 56 lb.; 2 days, 64 lb.; 7 days, 69 lb. After exposure to acetone vapor for 3 hrs. the bursting strain was 38 lb., 5 hrs., 42 lb., 20 hrs., 59 lb.; 2 days, 64 lb.; 7 days, 75 lb. After exposure to methyl alcohol vapor for 3 hrs. the bursting strain was 38 lb.; 5 hrs., 44 lb.; 20 hrs., 45 lb.; 2 days, 61 lb.; 7 days, 71 lb. If washed in alcohol instead of with water the bursting strain was 55 lb.

Preparation of Vulcanized Fiber.

The paper leaving the parchmentizing bath is passed through a second bath at 46 deg. to 60 deg. Cent. containing the same mixture of calcium thiocyanate and chloride but of slightly lower strength (namely b.p. 135 deg. to 140 deg. Cent.), then through squeezing rollers, and rolled up on a drum of large diameter; when the required thickness is obtained the mass is heated for half an hour at 120 deg. to 130 deg. Cent. cooled, washed, and dried. In this manner a very fine vulcanized fiber results resembling vegetable ivory in hardness. It can be sawn, turned, and tapped, and will take a very high polish. The dried mass contains no indication of the original layers of papers, nor are any of the fibers of the paper visible, and there is no tendency to split in the direction of the layers.

The passage of the paper through the second and weaker bath after parchmentizing is necessary, because the surface of the parchment has feeble adhesive properties, and it is difficult, if not impossible, to obtain a compact mass by superimposing and pressing a number of such sheets. In the passage through the somewhat weaker bath the surface of the paper is wetted with a solution which will dissolve cellulose when heated, but the temperature of this bath is kept below the solvent point. When the prepared mass is subsquently heated this solution dissolves some cellulose on the surface of the paper and cements the sheets together uniformly and completely; on cooling, the fiber sets in a matrix of jelly.

The preparation of the vulcanized fiber at present on the market is effected by means of a concentrated solution of zinc chloride. Sulphuric acid is useless for this purpose, as the solvent action of the acid is so rapid that it has been found impossible to cement more than two or three layers of paper together before it pulps. In the zinc chloride method, the paper is passed first over a heated drying cylinder into a bath of concentrated zinc chloride of sp. gr. 1.8 at 40 deg. Cent., the concentration and temperature of the bath varying slightly according to the quality of the paper used. It is then rolled up over a large heated drum to the required thickness. The treated fiber is washed in zinc chloride baths of successively diminishing concentration until it contains less than 0.1 percent of zinc chloride. This washing process is difficult owing to the great tendency of the zinc chloride to hydrolyze, and deposit zinc hydroxide and oxychloride in the fiber; it is very slow and cannot be hastened, or blisters may be produced in the fiber and an inferior product result. For sheets ¼ in. thick the washing operation is said to take 3 to 4 weeks, and for 2-in. sheets 6 to 8 months. The washed fiber is dried at 40 deg. to 60 deg. Cent., pressed, and sometimes calendered.

In the calcium thiocyanate method the solution required is less concentrated, and the washing operation is rapid and complete. The certain absence of zinc or other metallic hydroxide or chlorides, is of advantage in using the fiber for electrical insulators, etc.

Mercerizing Action.

Strong mercerizing effects may be obtained on cotton fabrics by immersing them in calcium thiocyanate solution; the fabric shrinks and lustre and increased dyeing properties are obtained. If immersed in hot solutions the lustre is decreased and the fabric becomes stiff and is permanently altered so that after washing it still retains its stiffness. Treatment in the cold solution, however, leaves the fabric soft and pliable.

Experiments with cotton hanks in cold calcium thiocyanate solution of decreasing strength show that the best efforts are obtained with a solution containing 60 Gm. of calcium thiocyanate per 100 Cc.; the cotton shrinks about 16 percent of its original length when added to the bath dry, and 21 percent when wetted out first. With both stronger and weaker solutions the effect decreases, and scarcely any effect is observed with calcium thiocyanate solution of sp. gr. 1.25.

A large number of experiments on cotton hanks have been carried out, which show that the effects such as shrinkage, dyeing properties, etc., vary with the concentration of the solution, time of immersion, temperature, and the composition of the solution. Different effects are obtained with different thiocyanates, and even by the addition of small amounts of other thiocyanates.

The effects obtained on cotton by these means have so far not proved superior to those produced by the action of caustic soda, and as the latter is the cheaper this process does not offer any apparent advantage. The possible variations of the number of factors involved are, however, so great that further investigations may bring to light effects of industrial interest at present unsuspected.

Action on Raw Jute.

If raw jute is boiled for ½ hr. in calcium thiocyanate solution of sp. gr. 1.3 and washed and dried the fiber bundles are more or less broken down, and the fibers themselves become soft and curly, while still retaining their strength. With stronger solutions the action is too severe, the fibers becoming gelatinous and partially dissolving; in weaker solutions little effect is seen.

Preparation of Calcium Thiocyanate.

It will not be out of place here to give a short description of the manufacture and properties of calcium thiocyanate. In the purification of coal gas, the cyanogen compounds may be extracted in the form of ammonium thiocyanate by scrubbing the crude coal gas, before the removal of the ammonia, in a specially designed scrubber containing spent oxide kept moist with water. The mechanism of the reactions involved has been fully described in the technical literature. Practically all the hydrocyanic acid in the crude coal gas is recovered in the form of ammonium thiocyanate, which is periodically removed as a solution of 15 to 20 percent strength by spraying the scrubber with water. This method has been in commercial use in England for some years. The solution of crude ammonium thiocyanate is readily converted into the calcium salt and purified by special, but simple methods.

Calcium thiocyanate may also be readily obtained

by fusing calcium cyanamide with sodium chloride, dissolving the melt in water, digesting the crude sodium cyanide with free sulphur to convert it into sodium thiocyanate, filtering and concentrating the solution. During the course of the evaporation, the sodium thiocyanate will react by double decomposition with the calcium chloride present in the solution forming sodium chloride which will be deposited quantitatively as fine crystals, leaving a solution of pure calcium thiocyanate.

Calcium thiocyanate may also be obtained from calcium cyanamide by preparing thiourea as an intermediate product.

Calcium thiocyanate is a very soluble and deliquescent salt, but may be obtained in crystals containing three molecules of water. The concentrated aqueous solution is very viscous, and dissolves not only cellulose, but also natural silk, acetyl-cellulose, and gelatin; it has no action on wool. It dissolves a number of metallic hydroxides such as lead, zinc, cobalt, nickel, cadmium, stannic and ferric hydroxides, all of which are reprecipitated on dilution. Tricalcium phosphate will dissolve to a small extent in the hot, concentrated solution, while on the other hand certain water-soluble salts, such as sodium chloride or potassium chromate, are practically insoluble.

The Bad Odor from Sulphate Pulp Mills

By BROR N. SEGERFELT

Ever since the discovery of the sulphate pulp process down to the present time energetic efforts have been made to overcome the evil smelling gases that this process envolves. In Sweden a sulphate mill, Orebro Pappersbruk, in the years 1902-1904, had to answer in a lawsuit against the towns people, with the result that the owners of the mill were condemned to build a high chimney to help eliminate the bad odor.

In connection with the above mentioned mill Professor Klason, and Klason and Henry Person made the first systematic investigations into the nature of the evil smelling gases evolved by the sulphate process. They proved that the bad odor was caused by organic sulphur compounds, which were formed by the sodium sulphide in the white liquor when cooking the wood in the digester.

It was especially the formation of methyl mercaptan and methyl sulphide which by their presence in the atmosphere caused the odor. Methyl mercaptan is the more evil smelling of the gases, and the more this compound is diluted with air the worse it smells. Both gases are highly volatile at ordinary temperatures; methyl mercaptan with a boiling point of 6 degrees Cent., and methyl sulphide with a boiling point of 38 degrees Cent.

It is proved that these gases in mixture with air, as they commonly will be during the manufacturing process, have no evil physiological effects. On the other hand, when concentrated, as they come from digester or evaporator, people remaining in a room filled with those concentrated gases for a certain length of time are affected in the eyes. This is, however, more as a result from the methyl alcohol which is present in considerable quantity in the relief and evaporator gases. The methyl alcohol vapor is proved to have severe constitutional effects on the whole human organism, and especially the eyes. But the alcohol vapors can easily be condensed, and the uncondensed remainder has never seemed to cause any evil effects.

During the sulphate process the obnoxious gases are evolved: (1) in the digester, (2) in the evaporator, and (3) in the furnace, and released periodically by relieving the pressure of the digester, and when blowing off the pulp, and continously from the evaporators and furnaces.

Klason and Segerfelt* in a research work have made series of experimental cooks, especially in order to determine: (1) The amount of organic sulphur compounds and methyl alcohol; (2) how the percentage of sodium sulphide in the white liquor influences the amount of methyl mercaptan, methyl sulphide and methyl alcohol; (3) how to explain benefits in stronger fiber derived from adding sulphur or soldium sulphide to the white liquor.

It may be of interest to mention the method used to determine quantitatively the amount of hydrogen sulphide and methyl mercaptan in the gas. The method was first used by Klason and is founded on the absorption of the gases in a solution of mercuric cyanide, $Hg(CN)_2$ by the reactions.

$$Hg(CN)_2+2HSCH_3=Hg(SCH_3+2HCN$$
$$Hg(CN)_2+H_2S=HgS+2HCN$$

Thus there are formed mecuric mercaptan, mercuric sulphide and hydrocyanic acid. Both the mercuric compounds are insoluble and almost unchangeable in the atmosphere. The precipitate has to be filtered, dried at common temperature and weighed. To determine the mercaptan the weighed precipitate is treated with boiling hydrochloric acid. HgS is not dissolved while $Hg(SCH_3)_2$ is decomposed thus:

$$Hg(SCH_3)_2+HCl=HgSCH_3Cl+HSCH_3$$

The main results of Klason & Segerfelt's above-mentioned research work are as follows:

(1) The formation of chemical compounds in the sulphate cooking process consists principally in that the gummy hydro-carbons are transformed into saccharin acids, which neutralize the alkalis, and, further, that the high large lignin molecule is parted in smaller ones, which are dissolved in the alkali by the presence of 2 hydroxyl complexes therein, the quantity of which increase a little by the saponification of the methoxyl complexes of the lignin.

(2) Besides the said saponification of the lignin there is always formed methylalcohol as well as methyl mercaptan and methyl sulphide, the two latter compounds in smaller quantities than the methyl alcohol. If the amount of alkali is not sufficient, the percentage of methyl mercaptan increases, and, on the contrary, the percentage of methyl sulphide increases, if the amount of alkali becomes greater. Under the same conditions a wood rich in rosin yields more mercaptan than a wood poorer in rosin.

(3) Straw of wheat contains less percentage of hydroxyl complexes and gives also, by the sulphate

*Om det kemiska forloppet vid fram-stallning af sulfatcellulosa. Archiv for kemi, mineralogi och geologi. Band 4, No. 6.

cooking process, a far less quantity of methyl mercaptan.

(4) When the cooking process is carried on with white liquor, as commonly used in practice, about half of its amount of sulphur is organically combined with the lignin in the black liquor. It is on account of this fact and by the formation of volatile methyl sulphur compounds that Na_2S in the cooking liquor will only by degrees be effective as NaOH. In this circumstance we find the protecting effect to the cellulose fiber, that Na_2S evidently exercises.

Klason and Segerfelt found that the sulphur in the white liquor is used up as follows:

	Per cent.
Combined with volatile organical compounds	15.0
Combined with lignin	51.8
Combined as Na_2S	16.8
Loss	16.4
	100.0

The loss is supposed to come from an oxidation of sodium sulphide.

As to these figures, most of the sulphur compounds are to be found in the black liquor after having been blown off with the cook to the diffuser.

By sufficiently cooling the gas from the digester and mixing and diluting it with a greater amount of water, the gases will remain dissolved, and no particular odor is noticeable. The bad smelling sulphur compounds seem to be destroyed by an oxidation process in the presence of water, using up the oxygen dissolved in the water.

By treating the condensate from the steam evaporaters, where such are used, the smell from these, too, can be avoided, in the same way.

To abate the nuisance from the gas produced when the black liquor is evaporated and dried in a disk evaporator and rotary and burned in smelters, the question is rather difficult to solve.

Recommendations have been made to send the flue gases from the smelters or furnaces to the atmosphere through a high chimney. This will eliminate the bad odor in the vicinity of the mill, when the atmospheric conditions are favorable, but will never prevent tem to be noticeable at a longer distance from the mill.

To wash out the gases in scrubbers would be an expensive method, as the gases are greatly diluted with air and carbonic acid from the furnace. The scrubbers must be extremely large, the water supply great and the power consumption for fans and pumps too expensive. Also this method has never been tried out in practice as far as is known to the writer.

A clever management of the sulphate mill is the cheapest, and, I think, only way to minimize the bad odor, though one can not entirely eliminate it.

The main source of the bad odor comes from adding sodium sulphate to the evaporated black liquor, and Klason and Segerfelt have proved that the more sodium sulphate or salt cake is added, the greater the increase in the amount of organic sulphur compounds in the process. Klason and Segerfelt found that the loss of alkali must be kept down as much as possible. Not more than 20-25 per cent. of the alkali in the white liquor may consist of sodium sulphide. To keep down loss of alkali the diffuser and causticizing rooms must be in good condition. Should niter-cake, $NaHSO_4$, be used, the bad odor will always be increased, as much more of this salt must be added to cover losses than of salt cake, Na_2SO_4.

By running with high temperature in the furnace and having a suitable combustion chamber for the gases before entering the rotary, the best result will be gained. The sulphur compounds will be burned or oxidized to SO_2, and an almost odorless gas is discharged.

But by using a disk evaporator and rotary there will always be a destructive distillation of the organic substances, evolving great quantities of evil smelling mercaptan and sulphide. To avoid this is very difficult, and attempts have been made to burn these gases, but without satisfactory result.

Sundblad and Sandberg, Swedish paper-pulp engineers, have equipped their recovery-plants to eliminate the bad odor as far as possible with big furnaces, working with much air and wide blowing-pipe, and with big combustion chambers for the gases before entering the rotary. Instead of disk evaporators, the rotary is connected with boilers and economizers. In this way the destructive distillation of the black liquor is limited to the rotary only, and the result is a nearly odorless plant. Sulphate mills built and running according to this method in Sweden are: Karskars Cellulosafabriker, Skutskars Cellulosafabriker, Nensjo Sulfat Fabrik, Iggesunds Cellulosafabriker, Skoghalls Cellulosafabriker, among others. The output from these mills represents more than 100,000 long tons sulphate pulp 90 per cent. dry.

Summary:

(1) The bad odor from sulphate mills is evolved in the cooking process by treating wood with an alkaline liquor containing a certain percentage of sodium sulphide, and in the recovery process by evaporating and burning black liquor regained from the cooking process.

(2) The bad odor from the cooking process can almost be eliminated through cooling the gases sufficietly and diluting the condensate with a great amount of water.

(3) The bad odor will be less if a less amount of sodium sulphate is added to the smelters, and will always be serious if sodium bisulphate be used.

(4) The bad odor is almost eliminated in the recovery process by having a high temperature in the furnace and the combustion chamber, and by exchanging the disk evaporator for boiler and economizer. (Sundblad and Sandberg's method.)

(6) The bad odor is entirely eliminated when adopting the Rinman modification of Sulphate rocess, where no sodium sulphate at all is added. (This method is described in a paper by Bror N. Segerfelt, read at the annual meeting of the Technical Association of Paper and Pulp Industry, April 13, 1921. Technical Association papers, series 4, No. 1, printed in the Pulp and Paper Magazine, 1921.)

(See also Pulp & Paper Magazine, Dec. 8, 1921, p. 1233).

ANNOUNCEMENT.

The Pulp and Paper Magazine is pleased to announce that Guy Tombs Limited, have been appointed Steamship Ticket Agents for the Anchor-Donaldson and Cunard Lines, Canadian Pacific Steamships, French Line, Holland-American Line and White Star Dominion Line.

Lack of head work is responsible for many a "headstone" in the grave yard.

New Paper Sizing Method

A German Invention.

The blockade of Germany during the war compelled many industries to seek substitutes for materials. In most cases these efforts succeeded in sustaining the essential industries in spite of the lack of foreign rawstuffs. But while the arts and crafts in general returned after the blockade to the use of foreign materials, as far as the depreciation of German money allowed, some of the war-time inventions retain their value for peace times and promise successful working also in foreign countries. Among these may be reckoned the "Zellkoll-Amal" process, which has proven efficient for sizing fine papers in Germany.

As the paper mills became short of rosin, even in the first months of the war, many sizing materials were put out, the active agent of which was generally animal glue, or soluble starch, the sticky ingredient of certain seaweeds and mosses, or mixtures of these materials. Later on cumaron, a product of coal distillation, was used, or only alum was added to the paper stuff, without any organic sizing matter. Yet with none of these means could full sizing, i.e., perfect resistance to ink, be attained. The solutions of animal glue and starch paste receded almost completely with the backwater of the paper machine. A mixture of cumaron and animal glue proved satisfactory for the sizing of spinning and wrapping paper only, and alum alone became a common sizing for printing paper.

Soon the idea presented itself to perfect the sizing with animal glue, which for centuries has proved its value for tub-sizing, so as to make a good substitute for rosin in engine-sizing. In some of the German writing paper mills animal glue has for years been added to the rosin size with the effect of giving the papers a good touch. Yet in most of the mills they soon ceased with this addition, for they saw no effect from it. It seems that in most cases the composition of the water decided the success.

Economical Progress.

Help came to the mills at the right time with the invention of the Zellkoll-Amal Co. in Berlin, patented in Germany and in foreign countries, according to which paper pulp can be made hard-sized even without addition of rosin milk. The principal feature of the invention is that the animal glue is added to the pulp in the engine not in solution but as a jelly. This is disintegrated in the engine to finest particles in a semi-solid state, which cover the fibres and melt only when the paper web has been heated upon the driers to a certain degree. In this way the fibres are pasted together to a uniform body, and the paper is sized throughout. The glue is made into a jelly by addition of hardening matter, especially formaldehyde or formate of alum, either in the engine or before adding it to the pulp. The nature and quantity of the hardening agents decide the melting point of the jelly, and these can be adapted to the paper to be made. As the glue is added in a semi-solid state, it reaches the pulp almost completely; the process is therefore very economical.

Valuable China Clay Retention.

From the paper-maker's standpoint the invention became still more valuable by the observation that a much greater part of the loading, for instance china clay, talc, etc., which has to be added also to fine papers in order to increase their whiteness and smoothness and to make them better printable, remains in the paper sized with "Zellkoll-Amal" than in paper sized otherwise. (This effect is also included in the patent claims). The loading and the Zellkoll-size unite to an emulsion, and by this means the loading binds itself firmly to the fibre. While generally about 70 p.c. of the loading is lost, the loss with this process has been eventually confined to 20 p.c., and the loading sticks even in highly loaded papers so strongly to the fibres that these papers do not dust in the printing press, and the writing pen does not tear small particles from it. German and foreign patents cover this method of loading.

The specialists who worked on the perfecting of this process state that by it the sizing of paper pulp has been made an operation from which the element of chance has been ruled out.

Another feature of this process is that not sulphate of aluminium but formate of alum is used to fix the size upon the fibre. This salt is even capable of macerating the fibre without any size, so that paper made from it proves ink-resisting. Using formate of alum in combination with the animal glue sizing described above, results in another advantage: sulphate of barium can be precipitated in the pulp and fixed to the fibres. For this purpose one prepares the formate of alum by mixing solutions of formate of barium with sulphate of aluminium and adds this mixture to the solution of glue. Thus sulphate of barium (blanc fixe) is precipitated in finest distribution.

Papers sized in this manner are remarkably strong, hard, touchy and sounding. They have, if made from chemical pulp, the characteristics of rag paper. Fine papers, for instance, book, bank, writing, drawing, document and blue print papers, can profitably be sized in this way. Also, countries in which rosin is not a very dear commodity can use it, for the main advantage of the process is the high quality of the paper so sized in spite of the large amount of loading which it contains. Add to this in countries where glue is cheaper than rosin the possibility of using glue as sizing medium.

Sigismund Ferenczi.

(Reprinted from the China Clay Trade Review).

PRINTER WAS PEEVED.

Charley Harris, in the printing business, got slightly peeved at a letterhead from a doctor who wanted bids on several thousand letterheads, different sizes, different grades and different colours, and wanted the printing form held standing. So, Charley took his typewriter in hand and wrote:

"Am in the market for bids on one operation for appendicitis. One, two or five inch incision—with or without ether, also with or without nurse. If appendix is found to be sound, want quotations to include putting same back and cancelling order. If removed, successful bidder is expected to hold incision open for about sixty days, as I expect to be in the market for an operation for gall-stones at that time and want to save the extra cost of cutting."—*Kansas City Post.*

Every joy is gain and gain is gain, however small.—*Robert Browning.*

If the world is ever to be saved it must be saved through its childhood.—F. B. Meyer.

British Trade News

(From Our Own Correspondent).

London, 7th Dec., 1921.

Mr. A. L. Dawe, who has become assistant to the general manager of the Canadian Export Paper Coy., in London, will find plenty of scope for his great abilities in the United Kingdom. He will arrive in the land of competition, where underselling, cheap products, as well as dear and high quality products of the best home and foreign mills, may give some thought for the vicissitudes which a market undergoes. But Mr. Dawe received his early tuition in the same school as Mr. Stanley Cousins, if I remember correctly, and the men Edward Lloyd, Ltd., put on the road take some beating. However, Mr. Dawe, is coming back amongst old paper friends—and he will find a change, no doubt, as most people do nowadays, particularly if they have been abroad for any length of time. It is rumored here that the general manager of the Canadian Export Paper Coy., will be absent for an indefinite period and that the staff is being overhauled.

Congratulations to Mr. Beck.

The recent descriptive articles written by Mr.. Edward Beck on his European visit were read with much interest here and the congratulations of the British pulp and paper men go out to him on his appointment as Secretary to C.P.P.A. His experience as a newspaper man and his experience recently obtained in Scandinavia will be valuable adjuncts to the Association. There is an old saying that newspaper men are paid for finding out the business of other people and Mr. Beck's writings on Scandinavia indicate that the C.P.P.A. have got the right man in the right place. On this side of the Atlantic we would like to see a little more of him so that he could enlighten the Dominion pulp and paper men on their chances in the British market—the details, of course, to be circulated privately for the benefit of members of the Association.

Is the Export Trade Studied?

From a Canadian point of view, this is a question that wants a good deal of thinking out. For some time past I have had an idea—and I hope I am wrong—that the men of the Dominion do not give the British market sufficient attention. There are Trade Commissioners here for Canada and now we have a Canadian Chamber of Commerce started. Are they enough to help exports? The Chamber of Commerce is in its infancy and wants all the encouragement one can give it in money and enquiries, and, on the other hand, the Trade Commissioners are doing their little "bit," in their own way. But what is really wanted is a periodical visit from the pulp and paper men, or their fully accredited representatives, to visit the market, find out for themselves the good and bad points—and the loopholes—and return home with the intention of competing for some of the trade. The editor of an important Canadian paper told me the other day that he often surprised officials when he mentioned trade chances and Canadian firms often turned down orders because they were more interested in their own domestic market. But the latter remark does not apply to all firms. I know some Canadian firms who enjoy a good export trade to-day, because they used discretion in selecting their British Agents and Importers, and encouraged them in catering for the markets full of competition as it is. Again, the old policy: "Oh! My market is across the border, because it saves trouble and worry," wants confiscation, if industry is to be developed and British capital encouraged, and I hope renewed efforts will be made in 1922 to give the English and Scottish markets, as well as the Welsh, the attention they deserve.

An Encouraging Sign.

The other day the Canadian Trade Commissioners for Scotland (Major G. B. Johnson) was in Aberdeen and he referred to the imports being received from Canada. Regarding groundwood, he said he noticed with satisfaction that a vessel had just arrived at the port from the Dominion with a large cargo of a material which British paper makers used to bring wholly from Norway and Sweden.

With the large amount of straw in Canada there is also room for the development of strawboard supplies. Here are the strawboard shipments to the United Kingdom during October last, the latest figures:—

Strawboard: from the Netherlands, 11,765 tons, valued at £109,115; Belgium, 48 tons, at £692; Sweden, 11 tons at £477;; Canada, 68 cwts, at £76; Germany. 12 tons at £89; U.S.A., 19 cwts. at £30. Here we have a market in one month taking close on 11,900 tons of strawboard and only 3 tons odd comes from Canada.

Cardboard, Pasteboard: from Germany, 76 tons, valued at £2,635; Canada, 39½ tons at £1,605; U.S.A. 21 cwts. at £111; France 11¾ tons at £1,197; Switzerland, 21 cwts. at £145; Netherlands, 8¾ tons at £359; Sweden, 258¾ tons at £14,282; Finland, 11¾ tons at £213; Belgium 14 cwts at £46; Norway, 41 cwts. at £55. The values are what appear on the Customs sheets. The total imports reach just on 405 tons in the month for October.

Canada, however, has a nice connection with the British market in millboards, though the recent shipments have not been as large as usual. The October imports were: From Canada, 384 tons, 1 cwt., valued at £13,026; Norway, 26 tons at £607; Belgium, 18 tons at £212; U.S.A. 126 tons, 6 cwts., at £5,526; Germany, 262¼ tons at £3,155; Netherlands, 18¾ tons at £410; Finland, 262 tons, 6 cwts., at £4,752; Sweden, 386 tons, 6 cwts at £10,710; Switzerland 18 cwts. at £23. These make roughly a tonnage of 1,613 tons, 11 cwts. of millboard for the month, so that in groundwood and millboards Canadians enjoy a good share of the British trade.

Outlook In The Paper Industry.

Everybody is hoping that the new year will open up some sort of a revival in the paper industry. But the outlook, as things stand at present is none too rosy. The political situation is calm; but the financial position at home and abroad will have to be more stabilized. Then rumors are floating about concerning a general election here and the German Reparations question is again to the fore. He would be a wise man who could survey the near prospects of trade in such a time of turmoil. The only ray of sunshine is the fillip Australia has given to the British papermakers in their new tariff.

In England to-day many paper mills are closed, some are working short-time, and some are working alternate weeks. There are about 7,000 out-of-work mill hands, and the strain, not to speak of the eagerness to obtain trade, on paper manufacturers and pulp men is very great just at the moment.

What German Paper Can Do.

When talk commenced here of giving a moratorium to Germany on the £25,000,000 due in January, in order to steady up the money markets and promote trade, there was a hue and cry in London. Before the war, the normal rate was 20½ marks to the £1; to-day it is 895 marks to the £1 and on Nov. 26th was 1,170 to the £1. To excuse Germany one payment would be a blunder it is contended, because the wiley Teuton is subsidising his industries to the detriment of reparations. Hence the cheap paper and boards in the United Kingdom. Germany is now flooded with paper money. The London "People," hit this side of the juggling question off to a nicety the other day in an improvised talk between two German statesmen in Berlin, who declare that they should not defray the cost of the war, but attempt to evade it.

Heinrich (dubiously): The Allies may of fools be the stupidest, but how can we expect that they wil still believe what we say?

Fritz (emigmatically): We have many paper mills —and printing presses—so to-day the value of the mark has to .01 dropped.

Heinrich: Ach! Mein Friendt!

(Scene: The Same—two months later).

Fritz: We some very good news have; those sheeps'-head Allies have one billion of our paper marks bought and the value of the marke has this morning to .001 fallen!

Heinrich: Then we at one Pfenning a bushel have buyers become, so the Allies to us can sell—or they may go to the devil and take our paper themselves to burn.

Fritz: (cynically): We must hope that they will the pride of generosity feel, now that they have the whole cost of the war paid.

Moral—"Scraps of Paper" do not always represent their face value. German pulp and paper mills pay 15 p.c. dividend down to 7 p.c. and raise capital up to 6,000,000 marks from 2,000,000. Everybody flourishing. Across in England—mills closed, short-time working, over 7,000 paper hands idle. We leave one war settled abroad; we come home to fight another war for our bread and butter—not to mention taxation.

Mr. F. E. R. Becker.

Our good friend Mr. F. E. R. Becker, the pioneer of Canadian wood pulp into the British market, will shortly celebrate his 50th birthday. He certainly does not look a half century old, particularly when he gets his favorite "Carona" cigar going nicely. But his youthfulness must evidently be attributable to the easy time he enjoys in getting rid of the Canadian and Nova Scotian pulps he handles so nicely. Canada owes a lot to him and his energies. I remember once hearing Mr. Frank Lloyd—one of the best trusted paper and pulp producers—say of Mr. Becker, that he was the friendliest and most kindly of pulp men. This was demonstrated some years ago when the mishap occurred at Chicoutimi, through fire in the city. Mr. Becker's first consideration was for the workers and he appealed for funds to help them. "Thank God," he said, "the fire is at a time when they can live in the woods." By the way, Mr. Becker is now close on 33 or 34 years in the wood pulp trade and industry. I understand his friends are going to entertain him to a luncheon in London to celebrate his "Half Century—and not out yet."

Groundwood Values Hardening.

There is a good supply of groundwood in the British market just now and pulp men are beginning to realize what their position is, under the law of supply and demand. Prices are hardening and some business is being transacted. With sulphite and soda pulp trade is not brisk. During the last few weeks some orders of a fair size have been booked. Unfortunately the dullness in the paper industry is stopping the flow of business—what little there is.

Prices are about as follows now: Groundwood (wet) £5½ a ton for spot delivery; Groundwood (dry) £11; sulphite (No. 1) £20; Easy Bleaching, £14½; Sulphite newsprint quality £12; unbleached soda (No. 1) £11; soda kraft, £11.

The Film Speaks.

We are getting into the film age in England. A great many of the paper mills—as mentioned by me sometime—are giving demonstrations, by means of films, showing how their special papers are produced. In other words, it is advertising by means of the film. The audience generally consists of printers, publishers and other buyers and all sorts of questions are put to the mills" lecturers. Most of the big firms have lecturers and film men just now appearing in the various large cities.

Canada and Belgium.

German pulp is now being very well taxed on its entry into Belgium. The market should, therefore, be closely watched. According to the Belgian records 1,618 kilos of pulp was received from Canada in 1920 and during the first six months of 1921 the figures are 1,618,388 kilos of pulp was received from Canada in 1920 fallen away very considerably, but it may be taken for granted that Canada stands a better chance in the market of Belgians nowadays than any German producers, who during the first six months of the present year sent over the border only 654,991 kilos.

IT PAYS TO GROW PULPWOOD.

"It will not be difficult to demonstrate to the paper manufacturer that he can afford to grow trees for pulpwood, when he is paying $30 per cord for peeled wood," said Dr. Hugh P. Baker, Secretary of the American Paper & Pulp Association, before the Yale Forest Club at New Haven, Tuesday night, December 13.

"It is my belief that we are passing out of the sentimental stage in forestry, and that in the next five years we are going to see the beginning of a real economic development in forestry. That is, the beginning of a real economic development in forestry. That is, the time has come when it is going to pay in dollars and cents to grow trees. In another year, as business becomes better, and our industries come back to reasonable production, we are going to come again to the condition which faced us a year ago, that wood for our industries will cost us more than it costs to grow it. When we can demonstrate to the paper manufacturer, for instance, that he can afford to grow pulpwood, we are going to see the same sensible turning to forestry that we have seen in the turn to better banking methods and better methods of manufacture."

If you have some rotten cigars given you, don't throw them away. They will do to break your boy of the smoking habit.

Technical Section

REVIEW OF RECENT LITERATURE.

B-5. Lumber Register. Can. patent No. 192,143, JOSEPH W. HALEY and CHARLES B. YELTON, co-inventors, both of Erlanger, Ky., U.S.A., Aug. 19, 1919. Claims allowed 60.—A. P.-C.

B-5. Logging Hook... Can. papent No. 192,512, WALTER BASTORD, Mission City, B.C., Canada, Sept. 9, 1919. Claims allowed 2.—A. P.-C.

B-5. Logging Hook. Can. patent No. 192,876, OMAR R. SHULL, Vancouver, B.C., Can., Sept. 23, 1919. Claims allowed 5.—A. P.-C.

C-6. Sawing Machine. Can. patent No. 192,879, HENRY STEWART, Ottawa, Ont., Can., Sept. 23, 1919. Claims allowed 4.—A. P.-C.

C-6. Wood Saw. Can. patent No. 192,875, W. SHEPHERDSON, Dymond, Ont., Canada, Sept. 23, 1919. Claim allowed 1.—A. P.-C.

C-6. Circular Saw Mechanism. Can. patent No. 191,332, JOHN HAKANSON and ALBERT WEBER, co-inventors, both of Seattle, Wash., U.S.A., July 8, 1919. —Claims allowed 2.—A. P.-C.

C-6. Lumber Rule. Can. patent No. 192,515 SAMUEL P. BOPST, Washington, D.C., U.S.A., Sept. 9, 1919. Claims allowed 1.—A. P.-C.

C-7. Barking Machine. Can. patent No. 191,635 CARL MALCOLM JOHNSON, Caribou, and HERBERT LESLIE CROUSE, Crouseville, co-inventors, both in Maine, U.S.A., July 22, 1919. Claims allowed 12 —A. P.-C.

D-4. Lefebvre Groundwood Process. Can. patent No. 192,176, ALBERT H. LEFEBVRE, Watertown, N.Y., U.S.A., Aug. 19, 1919. Claims allowed 5. Same as U.S.A. patent No. 1,277,737.—A. P.-C.

E-2; F-2. Concentration of Waste Pulp Liquors. Can. patent No. 192,187 ERIK OMAN Stockholm, Sweden, Aug. 19, 1919. Sulphite or sulphate waste liquors are cooled, with stirring, to a temperature below the freezing point, and the snow and ice crystals are withdrawn and used for the preparation of fresh liquor. Claims allowed 5.—A. P.-C.

E-2. Decomposition of Sulphite Waste Liquors. Can. patent No. 190,864. And H. Kiaer and Company, Ltd., Clemminge near Fredricksstad, Norway, assignee of Robert Wilhelm Strehlenert, Goteborg, Sweden, June 10, 1919. The sulphite waste liquor is previously concentrated and then heated under high pressure to convert the free and combined sulphurous acid into sulphuric acid. Claims allowed 10 —A. P.-C.

E-2. Method of Utilizing Sulphite Waste Liquors. Can. patent No. 191,432, ROBERT WILLIAM STREHLENERT, Goteborg, Sweden, July 8, 1919. Sulphite waste liquor is subjected to the action of SO_2 at a temperature of about 190° to 200° Cent. and a pressure of 20 atmospheres. Part of the sulphurous acid is decomposed forming sulphur and sulphuric acid, and the latter decomposes the waste liquor precipitating out the organic constituents and calcium sulphate. The gas containing the remainder of the SO_2 and sulphur is then drawn off and the sulphur is oxidized to SO_2 again. Claims allowed 13.—A. P.-C.

E-4. Method and Apparatus for Burning Sulphur. Can. patent No. 190,870, The Pratt Engineering and Machine Company, assignee of George F. Hurt, both of Atlanta, Ga., U.S.A., June 10, 1919. A body of melted sulphur is maintained within the burning chamber, and a spraying or scattering movement of the burning material is produced in the presence of a suitable oxygen supply. Claims allowed 47.—A. P.-C.

G-6; K-11. Paper Pulp Screen. Can. patent No. 191,601, The Sherbrooke Machinery Company, Ltd., Sherbrooke, Quebec, Canada, assignee of Anton J. Haug, Nashua, N. H., U.S.A., July 15, 1919. Claims allowed 41.—A. P.-C.

G-7. Process of Refining Sulphite Wood Pulp. Can. patent No. 191,608, The West Virginia Pulp and Paper Company, assignee of Viggo Drewsen, both of New York, N.Y., U.S.A., July 15, 1919. Claims allowed 6. Same as U.S. patent No. 1,283,114. See **Pulp and Paper, xix** (Feb. 24, 1921).—A. P.-C.

G-7. Process of Refining Soda or Sulphate Woodpulp. Can. patent No. 191,609, The West Virginia Pulp and Paper Company, assignee of Viggo Drewsen, both of New York, N.Y., U.S.A., July 15, 1919. The process of refining pine, spruce, or generally similar soda or sulphate woodpulp to render it suitable for the manufacture of nitro-cellulose or the like, which comprises partially bleaching such ordinary unbleached pulp with chlorine water containing 5 percent of chlorine (on the dry weight of the pulp) to produce partially bleached yellow pulp, subjecting this to an alkaline refining treatment by boiling under pressure for several hours to dissolve and remove coloring matter and converted products from the pulp and subjecting the resulting pulp to a supplemental weak bleaching process to decolorize the pulp and at the same time to keep down the amount of matter soluble in caustic potash below 7 percent. Claims allowed 7.—A. P.-C.

G-9. Means for Removing Water from Pulp. Can. patent No. 192,463. AKTIEBOLAGET KARLSTADS MEKANISKA VERKSTAD, assignee of R. E. Wagner, both of Karlstad, Sweden, Sept. 2, 1919. The sheet of pulp is subjected to the action of a series of heated rolls, and press rolls, in such a manner that the portion of the heating surface o fthe heated roll acting on the sheet before each pressing is increased in the direction of movement of the sheet. Claims allowed 3.—A. P.-C.

G-10. Pressed Roll for Woodpulp. Can. patent No. 192,890. AKTIEBOLAGET KARLSTADS MEKANISKA VERSTAD, assignee of Rudolf E. Wagner, both of Karlstad, Sweden, Sept. 23, 1919. Claims allowed 4.—A. P.-C.

G-11. Pulp Separation from Acid Liquors. Can. patent No. 190,881, JUDSON A. DECEW, Montreal, Que., Canada, assignee of William Hoskins, Chicago, Ill., U.S.A., June 10, 1919. The method of separating from an acid liquor paper pulp suspended therein which consists in bringing the liquor into contact with an immersed carbonate which is attacked by the acid liberating carbon dioxide, which rises through the liquor carrying the suspended pulp with it to the surface,

where it forms a scum which is removed. The method of separating pulp from sulphite waste waters, which consists in passing the latter over immersed limestone, and removing the resultant pulp bearing surface stratum. Claims allowed 4.—A. P.-C.

H-4. Electrolytic Chlorine Cell. Can. patent No. 192,228, The Hooker Electro-chemical Company, New York, N.Y., assignee of Clinton P. Townsend, Washington, D.C., both in the U.S.A., Aug. 19, 1919. The pressure in the gas space of the cell is kept equal to or less than that of the atmosphere, and means are disposed below the surface of the electrolyte for collecting the evolved chlorine before it reaches the gas space. Claims allowed 5.—A. P.-C.

H-5. Method of Bleaching Paper Pulp. Can. patent No. 191,376, Jamar E. Hesskanen, Canton, N.C., U.S.A., July 8, 1919. The method of bleaching pulp consisting in causing it to flow continuously through a series of bleaching tank units, each of which embodes a plurality of tanks, an independent circulation being maintained from tank to tank in each unit while a portion of the pulp from each unit is continuously carried over the next unit, the amount of pulp being continuously carried over from unit to unit being equal to the amount of pulp continuously fed to the apparatus. Claims allowed 6.—A. P.-C.

H-5. Method of Bleaching Paper Pulp. Can. patent No. 192,666, ANDERS D. BERGLIND, Gulskogen Norway, Sept. 16, 1919. Claims allowed 3. Same as U.S. A. patent No. 1,329,824.—A. P.-C.

K-6. Manufacture of Pulp and Paper from Garbage. Can. patent No. 192,652, JEAN P. PUTTAERT and HENRY F. J. PUTTAERT, co-inventors, both of San Francisco, Cal., U.S.A., Sept. 16, 1919. The process of manufacturing cardboard and the like from garbage, consisting in first removing deleterious hard substances, crushing and removing a part of the moisture, boiling with an alkali, washing and bleaching and reducing to a fibrous pulp, and finally converting the pulp into sheets. Claims allowed 2.—A. P.-C.

K-8. Production of Black on Vegetable Fibers. Can. patent No. 191,071, EMILE AUGUSTE FOURNEAUX, Manchester, Lancaster, England, June 24, 1919. Claims allowed 5. Same as Fr. patent No. 489,601. See **Pulp and Paper** xvii (June 5, 1919).—A. P.-C.

K-12. Fourdrinier Machine. Can. patent No. 191,336, JOHN E. ALPINE, Green Bay, Wis., U.S.A., July 8, 1919. Claims allowed 12.—A. P.-C.

K-12 Suction Box Arrangement for Fourdrinier Machine. Can. patent No. 192,675, ALBERT J. DAVIES, Kenogami, Quebec, Canada, Sept. 16, 1919. The suction box is suspended from a vertically disposed elastic bar, and is given a limited reciprocating movement. Claims allowed 9.—A. P.-C.

K-12 Automatic Device for Carrying Paper from the Driers to the Calenders. Can. patent No. 192,726. CHARLES E. POPE, Springfield, Mass., U.S.A., Sept. 16, 1919. Claims allowed 17.—A. P.-C.

K-14. Method of Regulating the Moisture Content of Hygroscopic Material. Can. patent No. 191,464. The Carrier Engineering Corporation, New York, assignee of Willis H. Carrier, Buffalo, both in N. Y., U.S.A., July 8, 1919. The material is placed in a chamber into which is discharged air, the moisture content of which has been previously regulated so as to obtain the required humidity conditions in the chamber when this air is mixed with the air already in the chamber. Claims allowed 28.—A. P.-C.

K-16. Extensible Wrapping Paper. Can. patent No. 193,012, The Arkell Safety Bag Company, assignee of David T. Abercrombie, both of New York, N.Y, U.S.A., Sept. 30, 1919. Stretchable flexible wrapping paper rendered waterproof consisting of a plurality of layers of paper cemented together by a waterproofing substance, and having crinkles extending in one direction and corrugations or pleats extending at a angle to the crinkles. Claims allowed 7. Same as Fr. patent No. 508,293.—A. P.-C.

K-18. Process for the Manufacture of Paper Board. Can. patent No. 192,797, BROR GUSTAVE DAHLBERG, St. Paul, assignee of C. E. Munroe, Forest Glen, both in Minn., U.S.A., Sept. 16, 1919. Claims allowed 8.—A. P.-C.

K-19. Carbon Paper. Can. patent No. 192,167, SAUROKU HATTORI, Tokyo, Japan, Aug. 19, 1919. An improved manifolding sheet comprising paper coated with a composition containing as essential constituents a barium soap blended with an oily material and a coloring matter. Claims allowed 2. Cf. U.S.A. patent No. 1,292,404; **Pulp and Paper,** xviii (Jan. 29, 1920).—A. P.C.

L-4. Method of Constructing a Paper Container. Can. patent No. 191,203, Henry Drysdale, Tottenham, London, England, July 1, 1919. A sheet of paper is wound around a mandrel in layers which are coated inside with an adhesive, with the exception of a short space at the end forming the first layer, so that there is an overlap of paper beyond the mandrel. This overlapping part is progressively pleated into overlapping pleats to form the end of the device, and this pleated surface is then compressed between two surfaces to consolidate it. Claims allowed 9.—A. P.-C.

L-4. Paper Bag Machine. Can. patent No. 191,306. The Lockport Machine Company, Lockport, N.Y., assignee of James Perry, Somerville, Mass., both in the U.S.A., July 1, 1919.—Claims allowed 3.—A. P.-C.

L-4. Paper Container. Can. patent No. 191,325, WILLIAM A. McKNIGHT, assignee of Walter S. Anderson, both of Chicago, Ill., U.S.A., July 1, 1919. Claims allowed 12.—A. P.-C.

L-4. Paper Containers for Nesting. Can. patent No. 191,474. Kilgour Brothers, Toronto, Ontario, Canada, assignee of Henry R. Hoyl, Philadelphia, Pa., U.S.A., July 8, 1919. Claims allowed 2.—A. P.-C.

L-4. Compartment Envelope. Can. patent No. 191,660 JAMES A DELAGHTER, Bonita, La., U.S.A., July 22, 1919. Claims allowed 1.—A. P.-C.

L-4. Handle for Paper Boxes. Can. patent No. 191,666. CARL J FREESE, Elyria, Ohio, U.S.A., July 22, 1919. Claims allowed 4.—A. P.-C.

L-4. Paper Can. Can. patent No. 191,720, The American an Company, New York, N.Y., assignee of Frederick P. Wood, East Orange, N. J., both in the U.S.A., July 22, 1919. Claims allowed 3.—A. P.-C.

L-4. Paper Receptacle. Can. patent No. 192,150, EDWARD L BAILEY, Morrisville, Pa., U.S.A., Aug. 19, 1919. A receptacle formed of a single sheet of paper and comprising a spirally pleated top, a spirally pleated neck and a spirally pleated body. Claims allowed 5. —A. P.C.

L-4 Envelope. Can. patent No. 192,949, FRANK A GODLEY, Palmyra, New Jersey, U.S.A., Sept. 30, 1919. Claims allowed 2.—A. P.-C.

L-7. Paper Spinning Machine. Can. patent No. 191,548, GEORGE SEATON MILDE, London, E.C. 4, England, July 15, 1919. Claims allowed 10.—A. P.-C.

PULP AND PAPER NEWS

Mr. Murray Crawford, a prominent lumberman of Halton county, died at Campbellvile, Ont., on the 10th instant. He was born in Halton county sixty-two years ago, and had lived in the district all his life. Forty years ago, Mr. Crawford entered the lumber business, and recently, when his business was incorporated under the name of Murray Crawford, Ltd., he became its president.

At the annual meeting of the Dryden Paper Company Ltd., held in Montreal last Friday, a deficit from operations was shown for the year to date of $321,700, after deducting a sum of $166,000 to take care of any shrinkage in the value of inventory. The balance sheet for the year ended the 30th September last showed total active assets of $1,508,552, and current liabilities, which consist only of acounts payable, of $48,907, leaving a working capital og $1,459,645. Shareholders present at the meeting made a number of enquiries in regard to the business of the past, and the prospects for the coming year. In reply to these, it was explained that the company was mainly interested in the manufacture of kraft, the market for which had dropped considerably—even worse, in fact, than that for newsprint. It was hoped, however, that the coming year would witness an improvement. The directors were reelected without change.

Specialty Bags, Ltd., with headquarters in Toronto and a capital stock of $5,000,000, was recently granted a Provincial charter, empowering the concern to manufacture, sell and deal in paper, cardboard, strawboard, cartons, boxes, bags and so forth. In trade circles it is understood that the concern will take over the Speciality Paper Bag Company, of Toronto. As business in its line has shown a good deal of activity, it is considered that the prospects ahead of the new organization are bright.

The unemployment situafion in the North Bay district is reported as being serious.

The printers' strike in Toronto has greatly delayed the completion of work on the History of Canada for use in the public schools of Ontario. The first copies of this book are now in the hands of the Department of Education and are ready for distribution. The book is a companion volume to the History of England, which appeared last September. Both books are from the pen of Professor Wrong, of Toronto University, and are written in a clear, vivid style. The History of Canada supplies a long-felt want in the public schools. It includes an account of the principal events in this country during the administrations of Sir John A. Macdonald, Sir Wilfrid Laurier and Sir Robert Borden, and of Canada's part in the great war. It will be ready for distribution at the opening of the next school term in January.

Speaking of the printers' strike, one is reminded that this has now lasted seven months. No settlement, as yet, appears in sight. The strikers claim that they are in a financial position to continue the payment of strike pay indefinitely, and, from the accounts of its financing which have been made public, this claim appears to be pretty well justified. On the other hand, in conversation with an employing printer this week, it was explained to the writer that the passage of time must render it easier for the employers to fill up the strikers' places. If one is to credit much of what one hears in this regard, it is possible for a person of good intelligence to be trained as a printer a good deal more quickly than many of us had imagined. It appears, moreover, that the publicity which has been given to the printing business by reason of the strike has had the effect of convincing a number of persons of good education, both male and female, that the work of the printer, both as regards its conditions and its remuneration, compares not unfavorably with many other callings open to them.

A new company, with a capital stock of $40,000 has been formed by Messrs, W. H. Farrell, W. S. Farrell and L. E. Westman, of Toronto, to handle wood products, including particularly pulpwood, pulpboard, cardboard and paper. The company is to carry on business as lumber merchants, pulp mill operators, etc.

The unusually large size of some of the editions recently published by Toronto papers has attracted some attention lately. This has been due to the large amount of advertising which has been carried this month.

The news that he has been seriously ill will cause regret among friends of Mr. G. Meerbergen of the Belgian Industrial Co. Fortunately, he is now on the road to recovery and will be able to join his family in Belgium early in the New Year.

A college library wants a copy of the Pulp and Paper Magazine for Feb. 10, 1921, who will help them out?

Through an error in our composing room which can be easily understood by comparing the advertisement of the Engineering and Machine Works in the Pulp and Paper Magazine for Dec. 8 and 15, a Waterous cut was used by mistake. This is a good time to laugh.

Mr. T. P. Howard, controller of the Howard Smith Paper Mills, Limited, Montreal is, we are glad to learn, once more in business, after his recent illness.

Mr. G. F. Steele, Montreal, last week paid a visit to New York on business.

It is pleasant to report that Mr. J. A. Bothwell is better.

LADDERS.

If you use ladders, follow these precautions:
Look for split or broken rungs and stringers;
Look for nails and sharp projections.
Avoid haste in going up or down ladders.
Never leave tools or materials on ladders.
Test your ground support, secure ladder carefully, or have someone hold it.
Step-ladders should be properly tied to prevent spreading.
Look behind stationary ladders for pipe or other projections.
When using extension ladders exercise care in raising or lowering extension.
Report defective ladders, do not use them.

Pacific Gas and Electric Company.

UNITED STATES NOTES

In the annual report of the Government Printing Office filed last week with Congress, Public Printer Carter uses a comprehensive illustration to give an idea of the amount of paper used by his bureau during the year. He says that if all the paper consumed in government printing jobs during the twelve months covered by the report was laid flat at a thickness of one sheet it would cover approximately thirty-five square miles, and if made into octavo books, piled one on the other, the volumes would soar 500 miles into the air. No fewer than 50,000,000 pounds of paper were used during the fiscal year endeed last June 30.

William M. Plant, Robert S. Theis, and George W. Gould, all three well known to the paper trade in the West, have organized a company to deal in mill shipments of book, coated, offset, light weight catalog, bonds, covers, cardboards, newsprint, kraft, manilla, wrapping and other lines of paper. The concern will be known as the Plant, Theis & Gould Paper Company. It will have its headquarters at 30 North La Salle Street, Chicago.

The possibilities in Alaska are touched upon also in the annual report of Henry C. Wallace, Secretary of Agriculture. Mr. Wallace points out that the Tongass National Forest in Alaska has a stand of not less than 70,000,000,000 feet of timber within its area of about 15,000,000 acres. The Forest Service, after a careful study of these resources and a scientific determination of the value of such Alaskan timbers for purposes of paper manufacture, has divided the forest into 14 development regions, each one of which contains sufficient water power potentialities and sufficient timber to run a large paper manufacturing plant permanently. It is estimated, says the report, that, under the plans now worked out, the two national forests in Alaska can furnish perpetually 2,000,000 cords of pulpwood annually. Two large sales have already been made and one small mills erected. It is confidently anticipated that extensive development along these lines will take place as soon as financial and industrial conditions become normal.

The Robert Gair Company, manufacturers of cartons and containers of all descriptions, is putting out a new issue of $4,000,000,000 7 per cent mortgage gold bonds, dated January 1, 1922, and due January 1, 1937. The proceeds of the issue are to be used to retire certain floating indebtedness and to provide now working capital. Incidentally, there will also be retired $230,000 first 6s of the Thames River Specialties Company, a subsidiary. With the new working capital provided by the bond issue the company will be in a position to take full advantage of any improvement in the industry. Within the past two years the company has acquired several pulp and paper plants, including the Haverhill Boxboard Company, the Thames River Specialties Company, the Straw Mill at Quincy, Ill., and the Chicago Coated Board Company. The companies inventories now amount to about $2,500,000 and the working capital required for carrying on the process of manufacture is large.

Shippers of Brooklyn, which is a large manufacturing and warehouse centre, are discarding the use of wooden containers and are substituting fibre cartons, saving approximately fifty per cent on their boxing costs. The fibre cartons are now used in the shipment of perfumery, soap, soap powders, tobacco, cigars, drygoods and notions, and they have come into general use also in the shipment of hardware, including cooking utensils, nickel, aluminum and steelware. They are proving of use as well in the packing of food products, such as cereals, green and dried fruits, canned goods, and in many pharmaceutical preparations. Before the war the fibre container for as large and weighty packages as 60 pounds of soap was regarded as an experiment, and the industry of making them and the practice of using them were in their infancy. The fibre containers, the basic material of which consists of straw, rags and other wood fibre, cost, before the war 25 per cent less than wood; during the war period the differential went up to 100 per cent in favor of the fibre container; it has since dropped back to 50 per cent. At first there was considerable trouble experienced with the freight handlers who were accustomed to handle all larger packages with their hooks, and complaints came from consignees that the packages were punctured and their contents damaged. This method of handling the packages has now ceased and the new containers have become so popular with the freight handlers, the transportation companies and the manufacturers that they are largely displacing wood for standardized containers. Another point in favor of the new style container is that they do away with the waste involved in the use of wooden cases. The latter are used but once, after which they go to the firewood pile. The cartons are ground up in the mills and are used in making new cartons.

Dr. Hugh P. Baker, secretary of the American Paper and Pulp Association, appeared before the Rivers and Harbors Committee in Congress last week and stated the position of the paper manufacturers on the matter of bills now pending for the prevention of water and stream pollution. While admitting that there may be certain cases needing immediate attention through remedial legislation, notably where there are factories—not necessarily paper plants—which pollute streams with acid wastes, Dr. Baker asked the committee to consider whether the legislation called for is of such immediate necessity as to demand the very great expense that will devolve upon plants required to provide filters and other artificial means of purifying waste water before it is returned to the streams. "The effect of the proposed legislation upon the paper industry," said Dr. Baker, "assuming that any one of the bills under discussion becomes a law or amends the existing laws, and assuming that such a law would be enforced to the letter, would be to cause many paper mills in the United States to close down immediately." He pointed out that the burden of installing purification apparatus in cases where great volumes of water are used would be an enormous one, and that this in addition to other huge burdens now borne by the mills would compel no few of them to suspend operations.

The Markets

CANADIAN TRADE CONDITIONS.

Toronto, 17th Dec.—As the end of the year approaches, it becomes evident that while, speaking by and large, the paper demand continues of fair volume, it has not expanded to the extent that there seemed good ground for anticipating when the revival of some three months or so ago first set in. Expectations in this respect have not been fully justified by events. Nor is a main reason for this far to seek. As has been often emphasized in these columns, the paper industry is one unit in the industrial fabric of Canada. The sort of revival that is needed in this industry is the revival that is bound to come as part and parcel of a general trade revival. And, whatever may be said in quarters where the wish is father to the thought, a general trade revival of substantial dimensions is not yet under way. In the view of many good judges of industrial conditions, it is coming, and is, perhaps, coming soon. But it has not yet set in. There is, in fact, just now, rather a curious—and not a wholly reassuring—resemblance between the judgment that is now being expressed with regard to the industrial outlook, and that which was expressed with regard to this outlook twelve months ago. Then it was said that, with the advent of spring, the country would enter on a period of industrial activity. Well spring, summer and autumn have come and gone since then. But the period of industrial activity did not materialize. On the contrary, the commerce and industry of the country experienced a time of acute depression. One hopes that history is not about to repeat itself in this respect in the year that lies ahead. Nor is there, on the whole, much ground for fearing that it will. Come what, come may, it is morally certain that, at the very worst, the country will, in the coming year, fare immensely better industrially than it fared in the year that is past. And for this reason, among others: The necessary, but painful process of deflation is now pretty well completed. Trade conditions generally are on a more normal and stable basis, by far. Doubt and uncertainty are giving way —in the main, have already given way—to a determination that confidence, albeit of a somewhat tempered kind, shall be the basis of future commercial and industrial operations.

That last at any rate, is the prevailing sentiment in the paper trade. The industry, as a whole, has had much to be thankful for in that it has passed through a very trying and testing year with less painfulness than most other industries. In particular, has it to be thankful for the enhanced measure of activity which has been accorded its operations during the last quarter of the present year. The sky is not yet entirely clear. But it is clearing. In all branches of the industry, men whose opinions are entitled to weight take the view that, at the worst, the coming year will be a far better one than the last. Some, indeed—and among them men of considerable reputation for prescience—believe that it will be an unusually active year and that abundant prosperity for the industry is only "just around the corner." The corner, it is true, has not yet been turned, whether the business around it turns out to be only reasonably good or remarkably prosperous and paying.

PULPWOOD.—The situation as regards pulpwood, shows little change in that reported from time to time in these columns. The business in pulpwood is very dull, the demand being abnormally sluggish owing to the fact that most of the mills are heavily stocked with pulpwood bought at a figure enormously in advance of that at which it can be purchased to-day.

PULP.—The demand for pulp is still far from being satisfactory, though things are different from the state of almost complete quiescence which obtained a few months ago. Some prices at which pulp has been recently purchased are as follows: easy bleaching, $65; news grade of sulphite, $60; strong bleached, $90; and sulphate $73. These prices are at the mill. No doubt, higher prices are being asked, but such, according to information supplied to the writer by a manufacturer, are prices which recently have been actually paid.

NEWSPRINT.—The recession in the price of newsprint, and the necessity that will arise in all probability, to meet the price, in competition, of 3½ cents a lb., announced by the International Paper Company are very fruitful topics of discussion. The question of how, with manufacturing costs, including labor, on their present level, newsprint can be profitably manufactured at something like that figure, is one of which a great deal will be heard in the near future. Meanwhile, it looks certain that, with the price of newsprint on the toboggan, manufacturers of other lines of paper will find it hard to advance prices as some of them had been hinting at their intention of doing.

BOOK AND WRITING PAPERS.—The undertone in both book and writing papers is distinctly good, but, until the New Year has been ushered in, large orders are not likely to be forthcoming.

WASTE PAPERS.—The market in waste papers, which had recently assumed a far more satisfactory aspect, is now in a very unsettled condition. Stocks are small, and the prices of some lines had been advanced, but the demand from the mills is very limited. Altogether the market is now spasmodic and spotty.

TOILETS AND TISSUES.—The situation in toilets and tissues continues to present encouraging features. Demand, allowing for a certain seasonable slackening, is good, and prices unchanged and apparently firm.

The Situation in Montreal.

Montreal, December 20.—In taking into consideration the immediate future of the pulp and paper industries weight must be given to general trade conditions. Just now a fair amount of business is passing, but everyone is looking forward to the new year in the hope that we shall witness a revival. The paper trade is esentially dependent upon the briskness of business, or conditions in fact which are beyond the control of those engaged in the industry. The newsprint and some other papers is contingent to a large extent, upon advertising. In this connection the writer was informed by the head of a large advertising agency that the prospects for 1922 are exceedingly bright.

Some of the older firms who had been appropriations but, new firms were planning extensive campaigns. He instanced one American Company who had never advertised in Canada, but who had put aside a large sum for 1922. We recall cases of Canadian firms who, during the early days of the collapse in prices, decided that it was the right period either to increase their advertising or to inaugurate a campaign. Some of the long established firms pursued the opposite policy, with the result that a considerable amount of business—especially in branded lines of goods—was switched to the firms who adopted the more enterprising policy.

Business during the week has been fairly good in papers, but the pulp section has been quiet. There appears to be a belief that we shall experience a hardening in values, in line with the cost of production—but that of course depends on many circumstances. To use the Asquithian phrase we must "Wait and See."

PULPWOOD.—Very little business is being transacted. It is reported that peeled wood has been sold in Watertown at $18 per cord. Some of the smaller American mills, which ordinarily do not carry large stocks, are holding off. Rough wood is selling at point of shipment at $6.75 per cord, peeled at $11, and rossed at $13.

PULP.—The market for nearly all grades is dull, and is likely to continue so for at least a month. Advices from Sweden state that there is a great scarcity of mechanical pulp in Europe, and that the prospects favor firmer prices. Many Swedish mills are closed down owing to drought. Conditions are such that Canadian mills should not cut prices under a fear of Scandinavian competition. The following are the Swedish production figures for October—Bleached sulphite 1920, 11,961 tons; 1921, 2,611 tons. Unbleached sulphite, 1920, 61,903 tons; 1921, 25,306 tons. Sulphite, 1920, 15,917 tons; 1921, 10,565 tons. Newsprint, 1920, 89,781 tons, 1921, 11,888 tons.

FINE PAPERS.—Orders are coming in at a satisfactory rate. Jobbers are said to have very little stock on hand, and at the conclusion of their inventories are expected to come more freely into the market.

BOOK PAPERS.—Trade is fairly good—nothing rushing, but large enough to keep the mills employed.

ROOFING PAPERS.—For the moment trade is slow, is in what was described as a transitory stage. A meeting was held last week to consider the situation.

BOARDS.—In this section trade is spotty. The price of chip-board, straw-board and No. 3 pulpboard has been reduced from $55 to $50 per ton.

RAGS AND WASTE PAPER.—Although the supply of white rags is not large, so far it has kept pace with the demand. Prices for waste paper are on the easy side.

NEW YORK MARKETS

New York, Dec. 17.—(Special Correspondence)—Probably the most interesting development in the paper market during the past few days has been a strengthening of prices on kraft wrapping paper. Leading domestic producers have announced an advance of one-half cent per pound in the price of No. 1 kraft wrapping, making the new basis 7.50 cents. The rise was not unexpected, as the wrapping paper market has been quite active for some time, having enjoyed an especially good pre-holiday season this year, and it is reported that wrapping paper mills in a great many instances are sold up for a month or longer.

The fate that prices on No. 1 kraft have been boosted, whereas those on the No. 2 grade are unchanged, is likely to lead to a novel market condition, according to authorities in the jobbing trade. For example, jobbers say that even ordinarily it is somewhat difficult to induce many consumers to buy No. 1 kraft wrapping and pay the half a cent per pound more that usually obtains over the No. 2 grade of the same paper, and it is now believed that with a difference of more than a cent per pound buyers of wrapping papers will turn more generally to the No. 2 grade and refuse to buy No. 1 kraft wrapping. There is no gainsaying that in numerous instances users of wrapping paper can make the No. 2 grade of paper serve their purposes just as well as No. 1, and that they pay the half cent differential for the latter only because they desire to use the best. But with a difference of at least a cent a pound, and in some cases more, it is argued that demand for No. 1 wrapping will most decrease.

The newsprint market continues fairly active. Publishers are freely placing contracts for next year's deliveries, and it is stated on high authority that an encouraging number are contracting for the full year. Transient demand has at the moment slowed down to some extent, which would be expected in view of the approach of the year and the lower prics that become effective January 1. Nevertheless there is a steady demand for spot shipments of print paper. Consumption of nwsprint is running high at present, and publishers frequently find it necessary to augment their supplies by entering the open market. Newsprint production figures of the Newsprint Service Bureau, just iissued, are interesting. They show that in November the daily average production of newsprint was 78.1 per cent of the average daily output during the three months of greatest production in 1920, allowing for new machines recently started. The total production of the 44 companies reporting to the Bureau was 159,855 tons in November, and shipments in the same month were 158,406 tons. Stocks at mills on November 30 amounted to 32,044 tons, or 54 tons more than on October 31 last, and were equivalent to about four days' maximum production. These figures show that consumption of newsprint in November ran right along with production, and that manufacturers have very little stock on hand.

Fine papers continue to move in moderate amounts and at steady prices. Mills are not very busy; that is, in the sense of being rushed with work, but most of them have enough orders to keep them running at a fair rate of capacity. Book papers are comparatively quiet and quotations are easy. Machine finished book is quoted at from 6 cents a pound upward f.o.b. New York, with some inferior grades reported available at a trifle under 6 cents. Tissues are quotably steady and in good demand. Box boards have firmed in price, and some mills are asking $35 a ton and more for plain chip board delivered New York and $0 for news board. Demand for boards is slow, however, and the advance in quotations appears to be merely an effort on the part of manufacturers to improve prices.

GROUND WOOD.—Although reports generally state that consuming demand for ground wood has decreased, it is said that enough buying is being done to sustain prices and to give the market a farly

active appearance. A strong feature in ground wood appears to be that mill stocks are down to a low level, which enables producers to be more or less independent in their attitude and to insist on firm prices. Around $32 a ton f.o.b. grinding plant is the most commonly named price on domestic mechanical pulp. Canadian grinders are reported quoting down to $26 per ton, but it is said that the extra freight brings the cost of Canadian ground wood to consumers in which is between $38 and $40 per ton delivered.
this country up to the same point as domestic pulp,

CHEMICAL PULP—Current business in chemical wood pulp is rather spasmodic in character and of limited tonnage. Paper and board manufacturers are obviously buying carefully at just this season, when they are busy compiling inventories, and therefore trying to keep stocks of raw material down. Prices on pulps hold firm, however, and there is little or no selling pressure of moment. Bleached sulphite and kraft pulp are mostly favored in the demand, and these pulps are seiiing at least reported prifces. Soda pulp, bleached, at between 4 and 4.25 cents per pound, and news grade sulphite at from 2.50 cents upward at pulp mills, also are meeting with fair demand.

RAGS—There is little doing in papermaking rags. Mills are mostly out of the market as buyers, and dealers seem to be simply biding their time in the belief that demand will revive after the turn of the year. Of course, there are some packers who are anxious to move rags, and buyers who shop around the trade are managing to get some lots of rags at cheap prices. Values in general tend downward. Sales of satinets to felt mills are reported at as low as 85 cents per hundred pounds f.o.b. New York for No. 1 packing and 75 cents for No. 2 packing. Old thirds and blues are offered to mills at 1.75 cents and less for repacked stock and 1.25 cetns for rough packing at shipping points. Old whites are quiet and irregular in price, and new cuttings are quoted at wide ranges.

PAPER—The old-paper market has developed no important changes this week. The better grades are holding fairly steady in price, partly because there is a moderate movement of them into consuming channels and partly because packers are firm for the quotations named, and low grades rule at about last reported price levels mainly because there is little or no room for further recession. No. 1 hard white shavings are quoted at around 3.75 cents a pound f.o.b. New York, No. 1 soft white shavings at 3 cents, old books and magazines at 1.20 to 1.25 cents, old No. 1 kraft paper at 1.60 cents, white news cuttings at 1.70 cents, ledger stock at 1.65 cents, folded newspapers at 50 cents a hundred pounds, and No. 1 mixed papers at 35 to 40 cents.

OLD ROPE AND STRINGS—Old manila rope continues in steady demand from paper mills and prices are unaltered. Between 4.75 and 5 cents per pound at dealers' shipping points is the prevailing value of old rope, and sellers assert that they are receiving the higher figure on most shipments. Old bagging is in a market condition bordering onto dormancy and prices are nominal. Offerings of No. 1 scrap bagging to paper mills at 90 cents a hundred pounds, of gunny bagging at 1.10 cents a pound, and of roofing bagging at 60 cents a hundred pounds seldom result in sales, as consumers show little desire to buy.

REPORT ON THE USE OF POWDERED COAL.

The fuel problem in Central Canada has, through the fuel shortage experienced during several recent winters, been much in the public mind. At the last session of the Dominion Parliament a Special Committee of the House spent much time in hearing and accumulating evidence respecting the future fuel supply of Canada. and, as a result, a series of recommendations were laid before Parliament. These included the recommendation that the public be informed as to the best methods of using the various fuels for both domestic and industrial purposes in order to obtain the greatest possible efficiency and increase the demand for our natural products. The Government, through the Department of Mines and the Lignite Utilization Board, has already undertaken a comprehensive series of investigations having these objects in view.

Amongst the developments which may contribute to making Canada more independent in the matter of fuel supply are the carbonizing and briquetting of our low grade lignites. Another development that deserves the careful consideration of all large industrial consumers of fuel is the use of pulverized coal. A recent contribution to the available literature on this subject is a report just published by the Mines Branch of the Department of Mines, Ottawa, entitled, "**The Preparation, Transportation and Combustion of Powdered Coal,**" by John Blizard, which has been prepared with a view to showing that low grade Canadian fuels might be more widely utilized by burning them in powdered form.

Pulverized coal has been used for some years now in rotary calcining kilns, almost all cement plants being so equipped. It is similarily used, in lime burning, in the calcining of magnesite and in the calcining of siderite iron ore.

There appears to be a wide field, however, for the further development of the use of pulverized fuel in the production of power and heat in large industrial operations.

The author of this Report has given a very comprehensive and detailed description of the various systems used in the preparation, transportation and combustion of powdered coal. In addition, there is a review of many of the industries which are burning coal in the powdered form, with a detailed description of the methods employed in the more important of them, showing the advantages derived by using powdered coal.

Quoting from the introductory of this Report: "Manufacturers, and operators of coal fired furnaces cannot afford to disregard the possible advantages of pulverizing their coal before burning it. Hence the purpose of this bulletin will be fulfilled if it leads them, after making careful estimates, either to abandon their present method of burning coal on grates or stokers, and install the pulverizers, conveying system, powdered coal feeder and burner, best suited for burning powdered coal in their plant; or to reject, as uneconomical, the replacement of their present system of burning coal, by a system for pulverizing and burning it."

Copies of the Report may be obtained on application to the Director, Mines Branch, Department of Mines, Ottawa.



•TRADE•MARK•
REGISTERED

SOLE AGENTS in the United States, Canada, Mexico and Cuba for

Finnish Cellulose Association, Helsingfors, Finland

comprising all and every Sulphite, Sulphate and Kraft pulp mill in Finland, Manufacturers of superior grades of Bleached and Unbleached Sulphites, Easy Bleaching Sulphates and Kraft Pulps.

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General view of the plant of Electrochimica Pomilio, Naples, for the mauufacture of Caustic Soda, Chlorine and Pulp by means of Chlorine; described in our last issue.

WHAT CANADA NEEDS MOST

There are too many people in the British Isles. There are vast empty spaces in Canada which, given human occupation and human endeavour, will blossom like the rose. Canada's problem is to establish a connection between the people who have no land and the land that has no people. The action of Hon. F. D. Pattulo in going to England in an effort to obtain settlers for 2,000,000 acres on the British Columbia lines of the Grand Trunk Pacific is the kind of action which will have the most rapid and far-reaching effect on the future of Canada generally, and the prosperity of our nationally owned railroads.

In Great Britain the Canadian National Railways have recently made a wide distribution of a booklet specially prepared for women, pointing out the advantages for the proper kind of women to make their homes in Canada.

NEW STEEL BRIDGE AT EAST ANGUS.

Work on the new steel bridge to be constructed across the St. Francis river at East Angus has been commenced by the contractors, Messrs. G. D. McKinnon and Company of Sherbrooke.

Esparto Papers.

Messrs. James Wrigley & Sons, Ltd., Bridge Hall Mill, Bury, Lancashire, are just completing an extensive addition to their Esparto plant. When finished the plant will be the finest in the United Kingdom and the output of the mill in esparto papers will be trebled. Esparto to-day is £6 10s. a ton for Spanish No. 1 and £3 17s. 6d. for other qualities c.i.f. to U.K. ports.

	1921					1920	1919	1918	1917	1916	1915	1914	1913
	DEC. 1	SEPT. 1	JUNE 1	MAR. 1	JAN. 1	JAN 1	JAN. 1	JAN. 1	JAN. 1	JAN. 1	JAN. 1	JAN. 1	JAN. 1
Wood Pulp	188	169	243	262	327	226	218	206	205	124	101	103	100
Rags	135	115	139	195	227	253	211	140	136	91	93	96	100
Paper Scrap	160	122	131	180	214	271	190	150	166	105	84	95	100
Supplies	185	190	210	225	225	181	178	178	138	118	105	102	100
Chemicals	170	181	196	208	220	223	191	179	188	216	143	90	100
All Mat'rials	171	157	202	230	271	230	207	180	175	122	103	99	100
Labor	204	234	234	276	276	225	197	168	130	111	100	100	100
Material & Labor	178	173	208	240	272	229	205	178	166	120	102	100	100

Index Number for Materials and Labor at Oct 1. was 169, at Nov 1 was 172 Upon the commodity exchange basis, our papers are within 8½% of the 1913 value

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Pulp and Paper Magazine

OF CANADA

A Weekly Magazine Devoted to the Science and Practice of the Pulp and Paper Manufacturing Industry with an Up-to-date Review of Conditions in the Allied Trades

VOL. XVIX. GARDENVALE, P.Q., December 29, 1921. No. 52

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Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Toronto Office, 1402-2 C.P.R. Building, 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M.Sc., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

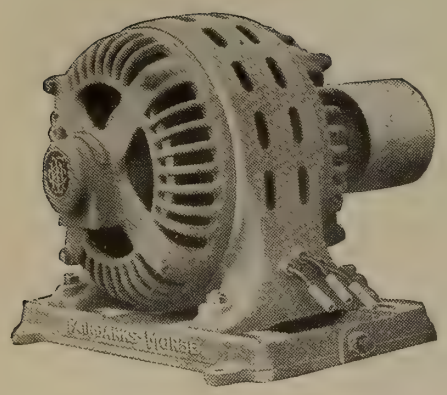
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Changes of advertisements should be in the Publishers' hands ten days before the date of issue.

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EDITORIAL

Happy New Year

GETTING IT STRAIGHT.

There was doubtless some surprise among our readers with regard to the editorial comment on the Australian Tariff in the Dec. 15th issue. This consternation however, must have been mild compared to our own when it was pointed out to us that one premise on which the editorial was based was an erroneous interpretation of the statement furnished us of the terms of the Australian tariff on paper. The idea was conveyed to our mind that Australia had established a graduated tariff according to which Great Britain had access free of duty to the paper market in the Island Continent while Canadian mills were handicapped by a duty of £3 per ton and other countries by an additional duty of £3 per ton. We do fully appreciate the fact that the preference given Great Britain is an unjust discrimination which occurred largely, if not entirely, through either hesitation or indifference on the part of the late Government in presenting to the Australian Government, Canada's claims for equal consideration. It has been intimated that Australian has a number of products which are used in Canada and could be used even more extensively than at present and on which the Australian might be willing to consider an exchange of preferential tariff conditions. It is not unlikely that steps taken some time ago may result in an arrangement which will put Canadian paper on a more nearly equal footing as regards that made in other parts of the Empire and place Canada also in a position for more nearly equal competition with countries whose low labor costs, depreciated currencies and cheap freight rates at the present time make profitable business with Australia a matter of considerable speculation.

Australia looks to Canada and must look to Canada as the logical source of supply for newsprint and a continually increasing range of other papers. Canadian mills did the best they possibly could under strenuous circumstances and under conditions which were not at all of their making, to keep Australian customers supplied with paper during the War. A number of them look to that country as their natural market and they can be counted on not only to furnish satisfactory paper but to give the most reliable service.

In view of the cordial relations and the steadily increasing amount of trade between the two countries and in view of the sentiment, so happily expressed recently by Premier Hughes, which must not be entirely neglected, there is certainly a strong argument in favor of putting Canadian paper on the same basis as that from Great Britain. A preferential tariff on Canadian paper is really an insurance of the supply to Australian consumers.

Explanations usually make matters worse, but it is only fair to the Canadian Pulp and Paper Industry that readers of the Pulp and Paper Magazine should not get a wrong impression of our reference to manufacturing conditions here.

A CANADIAN VIEW OF THE CASE.

A letter received last week by the Editor contains some information which would have been very welcome and helpful had it come a week or so sooner. Our comment in the issue of December 15th, gave our conception of what was most likely the intention in Australia in framing the tariff with regard to paper. Some of the comparisons as to the rate of duty were based on the mistaken premise, that British newsprint was free, Canadian charged with a duty of £3, and that from other countries another £3. Our correspondent enlightens us on this point:

"The Tariff law now operative in Australia places our mills at a disadvantage of £3 sterling a ton on newsprint and of 10 per cent ad valorem on other grades of paper as compared with Great Britain. (You are mistaken in supposing that a $15 a ton differential exists in the tariff as applied to Canadian. Japanese and Scandinavian paper is admitted to Australia on exactly the same terms as Canadian, as are also papers from Germany and other central European countries.)

"You are also mistaken in thinking that Canada should be able, because of assumed greater efficiency and cheaper raw materials, to undersell the world's paper markets even to the extent of $15 a ton, if need be. It is doubtful, indeed, at the present time if the margin between production costs and selling price on Canadian newsprint amounts to $15 a ton or anything like it.

"Furthermore, the advantages you suggest that Canada possesses are offset to a considerable degree by the cheaper labor in both British and European mills and, at the present time, more than offset so far as Germany, Austria and Finland are concerned by the depreciated currencies of the countries in comparison with that of our own."

The letter further states that manufacturing costs are practically identical in Canada and the United States. No two countries in the world have ideas and ideals so nearly alike and on such a high plane. The

standard of living which has been laboriously raised to its present high standard can only be supported by high wages, which, in turn, make for high costs of production. It is unlikely that either country will submit to anything lower than present standards.

There is no international situation exactly comparable to the British Empire, which is an organization of nations for mutual benefit, for promoting world peace and, when necessary, for mutual defense. The force that keeps the Empire together is principally the bond of blood relationship with a common ideal. The head office, so to speak, is at London but business is carried on directly between one branch plant and another. Each branch has shown itself ready and willing to make enormous sacrifice for the good of the organization. In the great emergency of the late war it was not a question of whether one part should do more or less than another; each simply did all that was necessary. Equality in willingness to serve is recognized in political equality but commercial equality is necessary to the permanent success of the organization. This means uniform tariff accommodation with an inclination and agreement to reciprocate for mutual benefit growing out of an increased interchange of the products of each part of the Empire for those of every other part.

In the working out of such a tariff of mutual accommodation, fairness demands that, where the same commodity is imported from several parts of the Empire, the rate of duty must be the same. To concede more to one part than to another is discrimination, but this may be due to the fact that the part discriminated against did not take proper steps toward securing the most favorable terms. This is evidently the case with regard to Canadian paper in Australia, where, by virtue of a tariff law recently enacted by the Parliament of the Commonwealth of Australia an import duty amounting to £3 per ton has been imposed upon newsprint paper entering that country except newsprint paper from the United Kingdom, which is admitted free; and papers other than newsprint, are admitted into Australia upon payment of a duty of 5 per cent ad valorem if from the United Kingdom and of 15 per cent. if from any other country, including Canada.

The effect of this preference accorded to the paper manufacturers of the United Kingdom, but withheld from Canada, will be to exclude Canadian newsprint paper from Australia, since a duty of £3 per ton, added to other disadvantages due to variance in exchange, difference in the standard of wages, working conditions, etc., and less favorable shipping rates, will make it difficult, if not impossible for Canadian paper manufacturers to compete in that market. The discrimination against other Canadian papers, amounting to 10 per cent. ad valorem, will effectually exclude such papers from the Australian market.

That loss of the Australian market under such conditions would not only be detrimental to the Canadian Paper Industry by blocking a natural outlet for a staple product, but this would seriously upset our national trade balance and so inflict an injury on the whole Dominion.

Australia has been growing steadily more dependent on Canada for paper supplies. At the same time, large sums of money together with much personal and pioneering sacrifice has been invested in plants to make paper for this natural market. In the belief that they should accommodate and protect the Australian consumers as permanent customers, Canadian paper mills supplied much paper to them during the last few years on which considerable more profit could have been made in the spot market.

In order to secure the preferential treatment accorded them, the British Papermakers appealed to the loyalty of the Australian Commonwealth on the ground of Empire solidarity, the needs of the returned soldiers, the desirability of keeping Australian money within the Empire, and on "the still higher grounds of patriotism." On none of these grounds is Canada entitled to any less consideration than that accorded any other part of the British Empire.

Any action taken by the Australian Government in excluding Canada from the preference accorded Great Britain, and on these grounds, surely would be discrimination against Canada as a sister dominion within the Empire and is in direct conflict with Australia's attitude at the Imperial Conference held in London this year and which was set forth by the Prime Minister, the Honorable W. M. Hughes, in a statement made before the British Empire League in London on August 22nd., as follows:

"Our safety, our prosperity, our existence, our future, " depend upon united action, and we solemnly resolved " that to the outside world we are not many, but one. " For good or evil we resolved to tread that path, and " it was a wise resolution.

"We depend upon each other, not only for safety and " security but for daily bread. The Dominions and the " people of these islands are bound by many ties, but " by none more real and lasting than those of buyer " and customer. The Dominions are the best customers " England has got, and Great Britain is the best buyer " in the world of the products of the Dominions."

There is reason to believe that the Australian Government is not unwilling to extend the preferential tariff on paper to Canada provided definite negotiations to that end are undertaken by the Canadian Government and suitable concessions made in return.

With Canadian mills shipping 3,000 tons of newsprint monthly, and other papers yearly to the value of a million and a half dollars, it certainly behooves our Government to get busy. To arrange a reciprocal preferential tariff is not merely to safeguard a market for one of our most important industries, employing thousands of Canadian workmen, but it also would make some materials, necessarily imported, cheaper to the Canadian consumer. Now is the time for the Government to act rigorously.

The Pulp and Paper Mill Engineer As An Organization

By J. A. HEDGCOCK, Asst. Chief Engineer. H. S. TAYLOR Limited, Montreal, Quebec.

The word "organization" is a broad one. It can be applied to a group of individuals numbering into the hundreds of thousands, or to two individuals only, but while two or more may form an organization, and be accepted as such, it does not necessarily follow that they are truly organized. A united effort for a common purpose with each individual in control of his special division of the work, whatever it may be, yet familiar with the work of every other, that his division may be interwoven with each other division as demands are made, is essential, and without it an association of individuals cannot be said to be truly organized.

In any single branch of standard engineering the demands of the engineer specializing in this branch are in general closely related to but one subject, and it is therefore the general custom for one individual to practice his profession and satisfy the demands of his clients. In lines of engineering specializing on the entire detail of a basic industry, however, three or more separate branches of the profession must be in demand, together with a clear knowledge of the operating requirements of each separate process.

For such a demand a quantity of detail is required that is too extended for one individual to have complete possession of at all times. He can be thoroughly familiar with it, but he can much better serve his clients, and also himself, by concentrating his activity on a particular division of the work, the entire detail of which is at his command for immediate use.

With a demand for detail greater than can be given successfully by one man, the demand must become one for more men, until both conditions are satisfied, each individual having special experience and knowledge of his own group of details. With a total requirement of detail spread out among a group of individuals, each individual, while specializing on his own particular group, yet familiar with those of his associates, an organization is complete, and if any demand within the scope of their work is met promptly and successfully, it can be said that they are truly organized.

In the beginning, the pulp and paper industry was represented by a few scattered mills, producing grades of paper very different from those of today. Electricity was little known and as a factor in the industry practically unknown; the mechanical features were crude and in general built up at the mill as their requirements presented themselves, and the development was carried out on the principle that a building was a building, and the equipment fitted to it.

The paper mill engineer was in evidence even before this period, but in these early days he had very little experience upon which to base his work, the details of which were few and of such character that the superintendent of the mill could master them as easily as the engineer, with the result that the superintendent generally built the mill from the drawings of the engineer, if he preferred, or if not, from his own experience. One of the largest paper mill cities, we can say, was founded by the engineer selecting a location where water power would be available and building thereon a number of separate buildings; paper manufacturers followed fitting equipment in these buildings, either with the assistance of the engineer or without it, as they happened to feel toward such assistance.

With a steadily increasing development of the industry, the manufacturers could not be satisfied with these conditions, and with electrical and mechanical improvements at his command, the engineer began opening the door to better mills and more and better paper at less cost. Building the mill with industrial experience only, and by rule of thumb methods became less popular, and the paper mill engineer began to be recognized as necessary and given real responsibility in the work. He soon systematized many of the old methods, building structures to fit the equipment and operating demands, in place of fitting the equipment to the structures. He formed layouts, taking into consideration present and future requirements in as far as the progress of the period allowed him to go, and carried his work through the construction period, superintending the construction of building and installation of equipment, this procedure dispensing with the six foot rule, and other rough forms of measurement as the principal factors in laying out and checking up the work.

The industry continued to grow in number of mills and especially in the size of the individual unit. Locations previously thought inaccessible were selected and developed, answering the call of raw materials and cheap power irrespective of distance, thus greatly extending the engineer's range of activity. Electrical and mechanical development was always one step ahead and the engineer found he was reaching the point where he alone could not keep up with the demands put upon him. Originally he had some three or four processes to design for, now he had four times this number, and the resulting grades of product again increased this number many times; electricity in the mill was far advanced and new and improved types of machinery were everywhere being installed, in many instances special for the different grades of production. The steam turbine began to supersede the reciprocating engine as larger units were demanded and these turbines were of different designs to fit special conditions.

In the larger mills the power developed was largely hydraulic only, and upon the fulfillment of demand for electrification, the hydraulic development gave way to hydro-electric, and this hydro-electric became in many ways special for paper mill operation, requiring knowledge of the industry to install to the best advantage. The preliminary work, including layout, became more complicated due to increased size of units demanded, and to advancement in electrical and steam development, requiring more time, thought and experience in its execution.

Under these conditions it was necessary for the engineer to be proficient in civil, electrical and mechanical engineering, to keep up with their latest developments as they affect the industry, and to keep in close touch with operating methods that were improving in pace with the mill itself.

The demand for more men was at hand, men experienced in the engineering and operating requirements of the industry, but with special training in one or more of these requirements. Electrical experience with training in the electrical demands of the industry, as well as mechanical experience, with training in mechanical de-

ing in both civil and electrical detail as applied to the industry, could find on opening, and experience in the forming of layouts, embodying present and future requirements as a whole rather than any particular branch was necessary. In addition, structural design as applied to the various structures required by the industry, and with these five divisions represented, any engineering detail that might come up would necessarily come within the scope of one or the other, thus fulfilling the requirement from an engineering standpoint.

While the five divisions as mentioned are the leading factors and in control, they are not in themselves sufficient to carry out the entire detail of a development as demanded by the industry of today.

In any pulp and paper mill work estimating experience is necessary, including a thorough knowledge of the cost of material, labor, equipment and finished work wherever the activity may be carried on. Commercial experience is required, as on any development the detail incident to price, terms, delivery, etc. of equipment and materials must be arranged and definitely settled to the best advantage of the development and the owner. With drafting and clerical experience the office requirement is completed, adding four divisions as a support to the five engineering factors.

To complete the organization three more divisions are required, completing the outside or field requirements. Field work experience with training in the requirements of the preliminary work and experience in supervision of the work under development is needed, also experience in the superintendence of construction of the actual development work is often necessary, these three field divisions together with the nine office divisions, completing the requirements for an engineering organization that can but handle successfully any detail within the scope of its work that is put before it by the industry.

With the foregoing paragraph in mind we see the term engineer change from the description of an individual, to that of an interdependent group, whose combined experience and special training would represent an authority on the engineering work of the industry.

Experience as so far referred to must in any organization be represented by individuals, and the allocation of this experience to the individual must vary in different organizations.

The division of electrical and mechanical experience may be combined in the duties of the Power Engineer, hydro-electric experience under the title of the Hydraulic Engineer. Layout experience would be handled by a representative trained in this special work, and structural experience is necessarily embodied in the Chief Draftsman.

Estimating experience would be the duty of a representative trained in this phase of the work, who would also be in command of conversion and general manufacturing costs throughout the many different processes. Commercial experience would be represented by the Purchasing Agent, and drafting and clerical experience by their respective office staffs. Field work and supervising experience is carried by the Field Engineer, or outside man, and experience of superintendence by the Construction Superintendent, who in addition to this actual construction experience is thoroughly familiar with those requirements, which pertain to pulp and paper mill work. The entire organization is presided over by a chief, whose experience and knowledge of the industry is such that he can forecast the requirements of each particular job and correlate and manipulate the experience under his control, to its demands whether of large or small extent, that the one objective—a satisfied client—is always reached.

No two jobs that this organization is called upon to carry out will be alike. They can, however, be divided into two classes, first—entirely new work, and second — extensions and improvements to present plant, the individual characteristics of each class being similar for one job after another.

In new work the field is clear; the client's organization at the commencement is generally nil, and the essential duty of the engineering organization is first to carry out the preliminary work, complete the development and then to turn it over as an operating plant, all in the shortest possible time.

In the second class, however, an operating plant is in the field that must be kept in operation despite any engineering or construction demand. The work must be designed with the present plant ever in mind. Building design must be similar that appearance be the same. Layout must be orderly and yet include present plant as a part thereof, buildings, piping, wiring, and in many instances, machinery must be designed to unite new and old work, and lastly an operating organization is present from the commencement that will take over the new work upon completion and operate it with the old as a complete plant. This organization will have many requirements that must be embodied in the new work, and they will naturally feel that they should have charge of the general details of construction and installation.

Extension or improvement work, especially if the existing plant be of considerable extent and the new work likewise, calls for a real effort on the part of an engineering organization. An amount of detail is encountered similar to that required for new work, and in addition the details of the old work must interlock with the new, or vice versa. Construction and operation work, opponents of long standing, must be carried out side by side without friction or dispute, shut downs of operation due to any phase of the new work are not allowable even during the tying in period, and yet progress of the new work must be the same as if in the clear, no excuses of hindrance on the part of the existing plant being tolerated.

While this class of work demands organization and real efforts on the part of the engineer, it can be carried out and each condition met successfully. A major essential however, is that the operating organization cooperate fully with the engineering organization, and better results are sure to be forthcoming if the construction and operating forces are kept as two separate organizations, the construction forces being under the control of the engineer and the operating forces under the control of the client.

It is here that the superintendent of construction of the engineering organization may be of real benefit, as he can superintend the new work throughout, reporting first to the client and then to his own chief, and theoretically dealing with the operating department through the client, at the same time receiving his own instructions through the same channels. Thus there can be no friction as there is no direct contact.

The superintendent is familiar with the operation and understands fully its demands; his every move where interference might be caused is made with operation first in mind and construction second, yet, through his knowledge of the dual demand he is able to subordinate his own work to that of the operators and yet keep his work well in advance of an extremely rigid schedule.

In carrying out any development, whether it be new

or old, the preliminary and detail work pass through the engineering divisions following a system that has been constructed to avoid the omission of even the slightest detail. General plans follow the layout, and are in turn followed by the detail drawings of the structures and equipment, all engineering work pure and simple.

In the consideration, selection, and details of purchase, of equipment and materials, however, there is a question, especially if the client's executive organization is on the work. The part the engineer may play in the consideration and selection will be brought out in a following article, but the details of purchase, involving price, terms, delivery, and adherence to original specifications might best be considered here, as they have a direct bearing on the organization as a whole.

The engineer through the variety and extent of his work can often obtain a lower price than can the client, and the terms can often be adjusted to be more advantageous to the client, than if he adjust them for himself. The time of delivery often has a direct bearing on the price, higher for earlier delivery and lower for later, and the engineer following a definite schedule in the progress of the work can set the time of delivery accurately, and thus gain for the client, who is often desirous of an early delivery irrespective of progress, a reduction in price by setting the time of delivery in accordance with the date of installation.

There is, of course, no objection whatever on the part of the engineer to the client taking over this entire detail, but in that case the information should be in the engineer's file for reference during the course of the work, and as he is organized to carry it out for the benefit of his own work if for nothing else, the taking over by the client will only add more work and thus more expense, and in general double the work as this entire detail should be relayed to the engineer, as it is essential in the performance of his work. The engineer must be in communication with the manufacturer for drawings and general details of the equipment under order, and must be certain that it is shipped per original specifications, generally issued from his office. For this work commercial experience is included in the organization, and the client can avail himself of it, and thus show a saving for himself and a benefit to the engineer by so doing.

It must be kept in mind that "details of purchase" is the work of the engineer's Purchasing Agent, not actual purchase. Contracts, orders, or any other essential documents are obtained from the manufacturer, checked and if satisfactory relayed to the client with approval shown on the one that, in the engineer's estimation, should be installed, providing, of course, that the client has not specified his own selection. The client is at liberty to accept that which he wishes, providing the preference of the Engineer does not suit him, but in allowing the engineer to carry out this detail the continuity of the work is uninterrupted, and in the end the satisfaction to both the client and the Engineer will be much more pronounced, as to one the detail is available at first hand, and the other is relieved of it but at the same time having absolute control of any transaction.

The grouping of experience in one location is logical and along the right line. Should the manufacturer have some bodily ill and should wish treatment therefor, he does not add a doctor to his organization and keep him there continually, but goes to the office of the specialist and secures the treatment prescribed, and upon the disappearance of the ill, whatever its nature may have been, the services of the specialist are discontinued, and no further expense incurred.

Why should not his mill be treated in the same manner as himself? If it requires improvements, let him go to the engineer and retain his services for as long as required, expense being incurred only during the period of employment, and the employee be dropped the minute his usefulness is past, thus averaging year by year to the client less expense than if continuously supplied with such service.

Such an organization as previously described can carry out its work with far greater thoroughness whether it be new work with a clear field, or additions or improvements in connection with existing plant, if in full cooperation with the client's organization, it being greatly preferred that the association between the engineer and the operator be at all times of the closest on any portion of the work where mutual interest is necessary, since, while the one is bringing the development into being, the other must operate it, thus bringing about a joint situation that cannot be neglected.

THE LOST PAPER.

Oh! pity me, I cannot talk;
So, put me in the files.
Don't leave me lying round about
In bunches or in piles.

You've been looking for me everywhere and the file clerk has gone on oath against your own declaration.

My whereabouts is unknown.

There has been a hurried and fitful flopping about of various piles of correspondence and records.

You need me in a hurry.—Where am I?

Drawers are pulled out and slammed shut. The desk blotter is cleared and lifted and discloses nothing.

You must have me within five minutes—Jones is waiting.

"D...it!" you say, "here's the very spot, I remember perfectly." "Not so," say I, "your memory plays you false. Try your pockets."

Out come papers, forgotten bills, lodge membership cards, all in a muddle. No results.

Only two minutes more.

"Try wifie and ask her to look in your other suit," I suggest.

The telephone is rung and after a couple of wrong numbers, the home partner tells you she can find nothing.

One minute more.

The conference will be waiting.

"Where in h—?"—

A few more things are thrown around and you bury your head in your hands, then get up and walk excitedly up and down, back and forth, calling upon memory—blank despair!

Time is up—'Tis three o'clock.

Across the room you walk and then your eye blazes. "Here I am on top of the filing cabinet, under Ledger X-Y-Z."

I laugh and chuckle with glee.

You hear it and then—

"Who the devil are you?" you ask.

"Me?—Why I'm the Imp of the Lost Paper", I reply, "and, man alive, be careful next time; I'm only paper, but I'm damned important."—Exchange.

Governor J. J. Blaine of Wisconsin has appointed Franklin A. Lowell of Rhinelander, State Inspector of of pulpwood. The duties of the office call for the supervision of pulpwood and shipment. Mr. Lowell is a newspaper publisher who gave ardent support to Blaine in the recent Wisconsin gubernatorial campaign.

News From Europe

The Tragedy of Paper.

Recent events in the European paper trade clearly show that as an industry its periods of prosperity are strangely uncertain; apparently success and wealth in this instance are too quickly gained to last; like the spendthrift's fortune, the riches of paper do not wear well. Everyone agrees that the depression in the trade cannot be wholly explained by the widespread or universal rise in the costs of production; many are shrewd enough to see that bad management in prosperity is frequently the core of the problem; that the resources of the industry, wood, coal, chemicals, rags, have been taxed and abused to a point that has seriously checked its growth; this in the now well known phrase is the tragedy of paper.

But a tragedy is no less a tragedy because it overtakes us as a consequence of our own faults. Had there been no trade jealousy, had those who controlled the production of raw materials been less greedy to exploit the necessities of an industry starving for lack of wood and fuel, had workmen been less intent upon forcing up their pay and forcing down their hours of labor, there might still be depression in general trade and in the paper industry, but the world would have been spared chaos and tragedy. For the desperate struggle to maintain production in spite of soaring costs of materials and labor has affected every country, and put out fires in industry which have not yet been rekindled; it has gravely injured the business and professional classes; and to the workmen themselves it has brought no small disaster.

This is the spectacle which may be seen now in Europe, and particularly in England and France in the very industry which under better management should be enjoying the greatest prosperity. A very large number of workmen are unemployed through the closing of mills which in all probability will never be reopened. Many mills are on short time, working three or four days a week instead of the normal five and a half. The most fortunate are busy still, it is said busier than ever.

That is the outline; now for some details. Prices of paper are tumbling down, but the costs of materials are nearly as high as ever, and until they come down, the paper trade will be in a bad way.

"In England," according to the well-informed editor from whom the foregoing views are taken, "manufacturers of paper have just become alive to the importance of Technical study and the work of the Technical Section of the Paper Makers Association of Great Britain and Ireland is evidence on this point."

The Economic Utilization of Heat and Power In Paper Mills.

The technical press of Europe is deeply concerned with the problem of heat and power in the mills. No wonder. As Mr. Grewin says in the articles which recently appeared in Svensk Pappers-Tidning, the technique of the production of steam has been studied too conclusively from the point of view of constructing engineers, who have neglected, in their search for power, the problems of steam as a source of heat. The waste of heat through faulty engineering, is the subject of a very large number of practical essays by experts of different European countries. The facts certainly need collecting and elucidating.

Technical Research in Europe.

The German and Scandinavian journals continue to publish articles on technical subjects and the reasons for this generous publicity are well worth a brief notice. The great virtue of the Technical Associations of the Continent is that they have proved the value of a public agenda—a well defined scheme of research collated down to the very latest results of international investigation. From such an agenda nothing is held back in the form of reservations. Trade secrets are excluded. In the course of a highly instructive interview, the writer was informed that this international exchange of technical knowledge had not met with favor in England. English paper makers still cling with jealousy to their "secret processes." "To guard as secret a process or supposed invention, when in plain fact it has been known and studied for years in the light of international research, must seem astonishing in these days; it is astonishing."

To the writer, intent upon estimating the value of the technical literature now available in England, it came as a painful surprise that even the facility of reference, that is of consulting current periodicals in foreign languages, was denied him upon no other pretext than that same jealousy, of which the writer was made acquainted in the interview just quoted. While all other nations are "pooling" their technical knowledge, the British paper maker, with pathetic futility, is locking up the treasures of a library which he does not even use in his own interests.

Waste of Paper.

The reviewers have devoted a good deal of space to E. C. Worden's work on Cellulose Esters. It comprises ten volumes, and, in the opinion of "Nature"—to take one view out of many—it is a curious instance of the expenditure of paper. An examination of the style of this prodigious treatise seems to bear out the reviewers' criticism. For example, the following passage might be condensed, and the blue pencil might be employed to improve the rest of the work.

"The aim of the work is to present the entire subject of the combinations of normal and modified celluloses—in such completeness, clarity, accuracy and detail, that inability to locate the information desired in the collective index will be postive evidence that the matter sought was either ephemeral, irrelevant, inaccuate, non-existent or valueless." This particular instance of "completeness, clarity, etc." has raised a smile in literary circles, who deplore the waste of paper.

Water Power of the British Empire.

The Water Power Committee has just issued a report which shows how far Britain has lagged behind in the development of this source of energy. The facts may be tabulated as follows:

	Horse Power Available	Developed	Per cent
Europe	47,300,000	8,450,000	18
United States	32,000,000	6,500,000	20
British Empire	60,000,000	3.000,000	5

As Canada furnishes 32 per cent of the hydraulic power of the British Empire, the table when reconstituted, gives:

Europe	47,300,000	8,450,000	18
Canada and United States	50,800,000	8,805,000	17.3
Rest of British Empire	41,200,000	695,000	1.7

There can be no doubt, when these figures are examined, that paper mills in England have to meet a heavy handicap owing to neglect of water power.

The Determinationur of Sulph Dioxide & Trioxide in Burner Gases

By R. DIECKMANN. Transla ted by CLARENCE J. WEST.

Writing in Der Papierfabrikant for April 1, 1921, Dieckmann points out that recently the importance of an exact determination of the sulphur dioxide and sulphur trioxide content of sulphur burner gases has been emphasized by Sander, since sulphur trioxide in the burner gases means a loss in the preparation of the sulphite acid solution. Sander found, in his study of sulphite, thiosulphite and polythionate, that an excess of mercuric chloride solution reacts with sodium bisulphite to form a water-soluble complex compound, sodium mercurosulfonate, $HgCl.SO_3Na$, and hydrochloric acid, in the proportion of one molecule of hydrochloric acid to each molecule of sulphurous acid.

Sander based his new method for the investigation of burner gases upon this reaction (See West's translation in Paper for December 8, 1920). The method has the advantage that the determination of both sulphur dioxide and sulphur trioxide may be carried out with one solution and one piece of apparatus.

Dieckmann, on the other hand, believes that it is simpler to investigate and analyse the burner gases with the Orsat apparatus. The same point of view is held by Krull, and by Schilling, who has modified the Reich apparatus, which modification he calls the "gas washing flask." Krull, in discussing the apparatus of Schilling, concludes that the determination of sulphur dioxide and sulphur trioxide in burner gases is easily and accurately carried out in this apparatus. In comparison with the Orsat apparatus, less time is consumed, and it has the further advantage that with the Orsat apparatus one must use a third absorption flask. The variation in results between the Reich and the Orsat method was found to be 2.2 per cent, a value which is sufficiently accurate for technical control apparatus.

Stimulated by this work, Dieckmann has compared the new Sander method with the Orsat method, using the flask employed by Krull. Although the time needed by the two methods seemed to be about the same, yet the whole operation in which the gas washing flask is employed is simpler than the use of the Reich absorption flask. The end point of the reaction is easily recognized.

In working with the Sander method, the end point of the reaction, while not as sharp as by the use of iodine solution and starch, or sodium hydroxide and phenolphthalein, is fairly sharp. In the titration with tenth normal sodium hydroxide, after the addition of the sodium hydroxide, the end point is more difficult of recognition. In the course of the present investigation, it was found that the addition of the mercuric chloride as well as the titration with tenth normal sodium hydroxide may be omitted, since the determination of both sulphur dioxide and sulphur trioxide may be carried out in the same absorption flask, which considerably simplifies the method as well as avoids the use of expensive mercuric chloride.

One fills the flask about three-fourths full of distilled water, then adds 10 cc. of tenth normal sodium of hydroxide, and uses as indicators phenolphthalein and methyl orange; upon passing through the gas (suction) the color change from red to yellow is very sharp. One records the number of cc. of water which has been displaced and then continues the gas until the sodium hydroxide is neutralized; the color change to orange may be easily recognized. The amount of gas first recorded (that is, the number of cc. of water displaced) corresponds to the volume per cent content of sulphur trioxide and sulphur dioxide; the second volume of water gives the volume per cent content of sulphur dioxide.

For example, the first volume of water measured was 120 cc., equal to 8.35 vol. per cent of SO_2+SO_3; the second measurement give 248—120 cc. or 128 cc. water, equal to 7.90 vol. per cent of SO_2; the vol. per cent of SO_3 is, therefore, 0.45 per cent.

This method avoids the titration of the neutralized sodium hydroxide, and also the use of iodine solution in the determination of sulphur dioxide in Reich's method; one thus works with a single solution, and without changing the apparatus, and is therefore a simple method and gives a sufficiently accurate control of the burner gases for the plant.

The following tables gives some of the results obtained with the various methods:

	Sander	Orsat	Reich	Dieckmann
Vol. per cent SO_2+SO_3 ..	8.44	9.20	8.90	8.90
SO_2 ..	7.95	8.04	8.10	8.25
SO_3 ..	0.49	0.80	0.80	0.65
Per cent of SO_3 in mixture	5.81	8.70	8.99	7.30
Vol. per cent SO_2+SO_3 ..	7.86	8.60	8.50	8.50
SO_2 ..	7.35	7.80	7.95	7.80
SO_3 ..	0.51	0.80	0.55	0.70
Per cent of SO_3 in mixture	6.49	9.30	6.47	8.24
Vol. per cent SO_2+SO_3 ..	8.45	8.60	8.75	8.75
SO_2 ..	8.23	8.00	8.35	8.35
SO_3 ..	0.22	0.60	0.40	0.40
Per cent of SO_3 in mixture	2.60	6.98	4.57	4.57
Vol. per cent SO_2+SO_3 ..	7.38	7.80	7.80	7.80
SO_2 ..	7.06	7.20	7.35	7.45
SO_3 ..	0.32	0.60	0.45	0.35
Per cent of SO_3 in mixture	4.34	7.69	5.77	4.48
Vol. per cent SO_2+SO_3 ..	7.01	7.80	7.55	7.55
SO_2 ..	6.75	7.20	7.15	7.05
SO_3 ..	0.26	0.60	0.40	0.50
Per cent of SO_3 in mixture	3.71	7.69	5.30	6.62

It is seen from the table that the value for sulphur trioxide according to Sander's method is always too low, which is ascribed to the difficulty in recognizing the color change of methyl orange when titrating with tenth normal sodium hydroxide. The simplified method described in this article, however, gives values which agree well with those obtained by the Reich method, which can only be obtained by the accurate work with the gas washing flask.

Dieckmann therefore recommends the use of this method, which is accurate and simple, which does not consume much time and which avoids the use of the expensive chemicals, iodine and mercuric chloride.

The calculations may be simplified by the construction of a curve showing the relation between the amount of water which flows out of the apparatus and the volume per cent of sulphur dioxide.

The Broke Hustler's Christmas Number has a supplement which describes pictorially the many active organizations that help make the social life at Iroquois Falls so interesting.

CONDITIONS IN AUSTRALIA.

The question of Canadian trade with Australia and New Zealand, particularly in connection with paper, has lately been to the fore, in relation to preferential tariffs. What are the prospects of Canada holding her own or of of increasing her exports to Australasia?

Mr Norman E. Wainwright, who has just returned from a two months visit, in an interview with a representative of the Pulp and Paper Magazine, gave his opinions as to our prospects in the sister Dominions. Mr. Wainwright represented the Howard Smith Paper Mills, Limited, and the Provincial Paper Mills, Limited. He investigated market conditions, and was also successful in securing some good business. In New Zealand he visited, Auckland, Wellington, Christchurch, and Dunedin; and in Australia, Sydney, Melbourne, and Adelaide.

"When I arrived in New Zealand," said Mr. Wainwright, "I found business conditions similar to those existing at the commencement of the year in Canada. They were beginning to realise that a slump was in progress; prices which had reached even higher levels than here, were falling rapidly, and many serious losses were being made both in general business and in the paper trade. The paper jobbers had been more or less speculating and carried heavy stocks. New Zealand and Australia were affected more than most countries, for the reason that the orders were not arbitrarily cancelled as in some other countries. The trade was going through a period of liquidation, and for six months prior to my visit practically no buying had been done. Firms were interchanging their stocks and carrying on in this way. It looked as if it were not possible to do any business, but I did succeed in getting some fair orders, mainly from the publishers.

"New Zealand is very patriotic, and the people do not limit their patriotism to the Old Country—they include Canada, recognizing that we are a part of the Empire. When I arrived the Legislature had the tariff under consideration. Canada was given equal preference with the United Kingdom, and was also given a preference on writing paper, which previously had not been included in the preferential tariff.

"In my opinion there is a chance of Canada developing a good business with New Zealand, particularly now that we have a preference. We should do increased trade in writings, bonds, printing, and book papers.

"Up to a certain period there was a misunderstanding as to the facts in relation to Canada's position with reference to the paper trade, and, under the impression created by propaganda, there was a mistaken feeling that New Zealand did not get much consideration from Canada during the war. Later, however, when the actual situation was made clear, and the publishers in particular realized that their interests had not been sacrificed, buyers of newsprint were convinced that they had not been charged unreasonable prices—in fact one of the largest purchasers made it known that he and other publishers were satisfied with the action of the Canadian newsprint firms, and that orders would be placed in Canada, provided of course the prices were competitive. During the war the prices of Scandinavian paper were very high in comparison with those of Canadian mills—it was therefore realized that the latter, in not forcing quotations higher, had treated New Zealand on a fair basis. Although the Scandinavian mills, at a later period, considerably reduced quotations, there was a feeling that this was a merely temporary drop, and that in the absence of Canadian and other competition prices of Scandinavian newsprint would be at once advanced. In other words, the publishers were of opinion that an immediate reduction in price was not the principal factor to be considered, and they were also sufficiently awake to the situation to realize that Canada is and must be the main source of supply of newsprint.

"In contrast to New Zealand, there is no preference for Canadian paper of any grade in Australia, and this country is on the same basis as any foreign country, including Scandinavia, Finland, and even Germany, when that country is able to enter the Australian market. There is a feeling in Australia that Canada is to blame largely for the present position, as no advantage was taken of the opportunity to negotiate for a preferential tariff. The Bill recently adopted allowed a preferential rate to be negotiated at the discretion of the Minister of Customs. The impression I received was that in order to obtain a preference Canada will have to reciprocate by granting something in return. Reference was made particularly to wool, fruits, and dairy produce.

"Australia should logically be one of Canada's best customers for paper. There is a large demand, particularly for grades that we are specially equipped to make. Temporarily the rate of exchange, combined with the duty, places us at a great disadvantage. At the time I was in Australia there was a certain amount of opposition to the British preference, even among publishers, on the ground that such a preference was calculated to create a monopoly and to lead to artificially high prices even from the country with which they most desired to do business. There was, I found, a mistaken idea that the paper trade of Canada was controlled from the United States. There was also a feeling in Australia that first consideration should be given to Great Britain, and the second to Canada. There was a distinct impression that many grades of paper which were imported from Scandinavia should come from Canada, but in order to get this business we must meet market conditions and competitive prices."

UNIVERSALLY TRUE.

(From the Brown Bulletin.)

Out of many thousand military suggestions contributed to the American Government by private citizens during the war, it is said that twenty-five were good.

That seems a small percentage, but in fact it was big enough to win the war!

And there was only one way to get the useful suggestions — namely to call on the brain power in America for voluntary service and to sift and select the ideas that would serve.

Now, the big enterprise of making pulp and paper, and all the products that follow on, is not so much a question of horse-power as of brain power. The Brown Company will succeed, as a Producing organization, just so far as it succeeds as a *Thinking* organization.

Your bit of paper dropped into the suggestion box may or may not be important in itself, but it is mighty important to *you* because it marks your enlistment as a *Producer of Ideas,* and your second—or your hundredth—idea may be a hummer.

So, go to it!

The untaught children of to-day are the unchurched multitudes of to-morrow.

Pulp and Paper Week

The following is a list of the meetings to be held in Montreal during January 25-27, 1922. These include a number of meetings of Fire Protective Associations.

CANADIAN PULP AND PAPER ASSOCIATION.

Annual Meeting, Ritz Carlton, Friday, January 27, at 10 A.M.

Annual Luncheon, Ritz Carlton, Friday, January 27th, at 1.30 P.M.

Annual Dinner, Ritz Carlton Hotel, Friday, January 27th, at 7.15 P.M. preceded by a Reception by the Officers.

Bag Section.—Annual meeting, Association Rooms, 701 Drummond Building, at 10 A.M.

Board Section.—Annual meeting, Vice-Regal Suite, Ritz Carlton Hotel, Thursday, January 26th, at 4 P.M.

Book and Writing Section.—Annual meeting, Association Rooms, 701 Drummond Building, Thursday, January 26th, at 2.30 P.M.

Coated Paper Section.—Annual meeting, Green Room, Ritz Carlton Hotel, Friday, January 27th, at 12.30 P.M.

Chemical Pulp Section.—Annual meeting, Vice-Regal Suite, Ritz Carlton Hotel, Thursday, January 26, at 10.30 A.M.

Felt Section.—Annual meeting, Association Rooms, 701 Drummond Building, Thursday, January 26th, at 10 A.M.

Mechanical Pulp Section.—Annual meeting, Vice-Regal Suite, Ritz Carlton Hotel, Thursday, January 26th, at 2.30 P.M.

Newsprint Section.—Annual meeting, Vice-Regal Suite, Ritz Carlton Hotel, Friday morning, January 27th, immediately at close of Association annual meeting.

Technical Section.—Annual meeting begins in the Ball Room of the Ritz Carlton Hotel, at 9.30 A.M. Wednesday, January 25th and continues at 2.30 P.M. Wednesday; 10 A.M. and 2.30 Thursday. Special luncheons at 1 o'clock each day in the Grill Room. Informal Smoker Wednesday evening at 8.30 in the Grill Room.

Tissue Paper Section.—Annual meeting, Association Rooms, 701 Drummond Building, Friday, January 27th, at 3 P.M.

Woodlands Section.—Annual meeting in the Ladies' Ordinary, Windsor Hotel, morning and afternoon of Thursday, January 26th, beginning at 10.30 A.M. Afternoon meeting starts at 3 P.M.

Wrapping Paper Section.—Annual meeting, Association Rooms, 701 Drummond Bldgs., Wednesday, January 25th, at 2 P.M.

Newsprint Service Bureau.—Annual meeting, Vice-Regal Suite, Ritz Carlton Hotel, Friday, January 27th, at 3 P.M.

Cost Accountants and Engineers, Newsprint Service Bureau.—Annual conference, Windsor Hotel, Thursday, January 26th, at 10 A.M.

Province of Quebec Limit Holders' Association.—Annual meeting, Windsor Hotel, Wednesday, January 25th, at 11 A.M.

Quebec Forest Protective Association, Limited.—Annual conference, Windsor Hotel, Wednesday, January 25th, at 2.30 P.M.

Annual Business meeting, Windsor Hotel, Thursday, January 26th, at 9 A.M.

St. Maurice Fire Protective Association, Limited.—Annual meeting, Windsor Hotel, Wednesday, January 25th, at 9.30 A.M.

Southern St. Lawrence Fire Protective Association, Limited.—Annual meeting, Windsor Hotel, Wednesday, January 25th, at 9.30 A.M.

A Bureau of Information and Reception Headquarters, will be established in the Green Room, First Floor, Ritz Carlton Hotel, with an Association representative in charge. All members and guests are invited to register there on arrival and make use of its facilities.

TAX ON EXPRESS SHIPMENTS DROPPED.

The public will save approximately $1,500,000 a month as a result of the elimination of the war tax on express shipments, according to George C. Taylor, President of the American Express Company.

The "Revenue Act of 1921" eliminates the war tax of one cent on every twenty cents and fractions thereof in transportation charges on all express shipments. This tax during the year of 1920 amounted to $17,502,-918. The average transportation charge for each express shipment was approximately $1.50 and the average war tax for each shipment was eight cents.

The elimination of the tax, therefore, will virtually amount to a decrease in rates of a little over five per cent. Mr. Taylor believes that this should have a tendency to stimulate business and thereby accelerate the rapidly improving conditions throughout the entire country.

"The American Railway Express Company handles approximately one million shipments a day or nearly four hundred million shipments a year," Mr. Taylor goes on to say. "The elimination of the tax will relieve the American Railway Express Company of an immense amount of labor which has been involved in calculating, entering on way bills and collection of tax, not to mention the expense of checking and accounting entailed.

"The Treasury Department has requested express carriers to advise all claimants who have claims pending for overcharges or who file such claims after December 31st, 1921, that claim for refund of tax should be filed on Treasury Department Form No. 46, with the Commissioner of Internal Revenue, within four years from the time tax was paid, claim being barred by statute of limitations if received after such time."

Mr. Taylor points out that as the Revenue Actbecomes effective January 1st, 1922, the tax on all shipments forwarded "prepaid" on or before December 31st, will be collected. On shipments forwarded "collect" and arriving on or after January 1st, the tax will not be assessed.

FOREIGN TRADE FOR 1921 SATISFACTORY.

Our foreign trade for 1921 must be looked on as highly satisfactory, for, if exports have declined, imports have gone down in even greater degree, says the monthly letter of the Royal Bank of Canada. We are not buying silk, cotton or wool and their products, on the lavish scale of 1920, and what we do buy, costs us far less. Imports of coal and petroleum, too, have gone down slightly in value. The result is that our trade for eleven months of 1921 shows an unfavorable balance of only 23 million dollars, compared with one of 128 million dollars in the preceding year.

British Trade News

(From Our London Correspondent).

London, 15th Dec. 1921.

The chairman of the British Wood Pulp Association (Mr. S. Nicol) has been elected Managing Director of Messrs. Berner, Nichol & Co., Ltd., formerly known as Berner & Nielsen, a name prominently associated and highly respected in wood pulp circles. The firm pushes Scandinavian pulp in the United Kingdom and Mr. Nicol was originally a junior clerk in the office.

Developments in Newfoundland.

Mr. H. D. Reid, President of the Reid Newfoundland Co., has returned to St. John's. He was on a two month's visit to England securing the interests of capitalists in the Newfoundland Hydro-Electrical water power scheme for the manufacture of paper and pulp. It is intended to provide power up to 235,000 h.p. and the Humber River fall will be partly utilized. Mr. Reid, who was taking out with him Mr. J. M. Alexander, Mr. H. S. Waite, and Mr. H. E. Whitehouse, of the hydro-electrical department of Messrs. Armstrong, Whitworth & Co., a well-known firm of engineers, of Newcastle-on-Tyne,—who are also interested in the scheme—said that he preferred British capital in the scheme to that of the States. A good deal depended on the attitude of the Newfoundland Government toward it and if they assisted financially the scheme would go through. The Government, however, were fully alive to the importance of the scheme for developing the industry in the colony and he fully expected their support. The Hon W. R. Warren K.C., Attorney-General for Newfoundland, who was a fellow passenger on the liner at Liverpool with Mr. Reid, stated that he understood the scheme would mean the introduction of £3,000,000 of capital into Newfoundland and he felt sure the Government would support it.

Heavy Mill Loss.

The serious state into which some of the British paper mills have fallen is shown by the balance sheet of Olive's Paper Mill Co. The accounts are made up to July 23rd, 1921 and include trading carried on by Olive Brothers on behalf of the company from January 1st to the 23rd July 1920. After charging bank and debenture interest, directors' and trustees' fees, income tax, and allowing £31,091 for depreciation of mill buildings and plant, there is a loss of £70,792. Stocks of paper and raw materials have been brought in at cost or market price, which ever was lower, and the directors feel that, given revival of trade the company should be able to go forward and make profits. A remarkable feature of the company's report is a claim made by the Government in respect of excess profits duty on the trade done between the 1st January and 23rd July 1920. The company are very rightly resisting the claim which, to say the least, is preposterous. The directors have also a claim for repayment of excess profits duty. Sanction for additional £100,000 borrowing powers is asked for.

Wood Pulp Review.

By the time these notes will appear in print we will be entering upon a new year. Up to the present the outlook is not very hopeful for either paper or pulp men; but there is one thing we are certain of and that is the year 1922 cannot be worse, as regards buying or selling, than 1921. For pulp men the past 12 months have proved most trying and the rise and fall of the markets—and the precarious rates of exchanges—played havoc with balance sheets of many trading and manufacturing concerns. But we must feel proud of the shipments of Canadian groundwood that reached England in 1921. Apart from the good qualities of the pulp, the supplies have been a special feature and it is to be hoped efforts in the coming year will not be relaxed, but strengthened, in retaining the position now occupied in British markets. From what I can hear groundwood producers are turning out a suitable pulp for the United Kingdom and it only requires the chemical pulp men to do their "bit" also in helping to capture a share of the market. How pleasant it is to hear British paper mill men say: "Canadian mechanical is very good." They say it is ahead of Scandinavian and that is what we want to hear. There is a chance now for the sulphite men in 1922 to earn the reputation of the groundwood men in 1921.

At the present time the market for all pulps is just as dull as it opened at the beginning of the year, and, although I am unable to give the year's imports until the end of January, it may safely be assumed that they are much below those of 1920.

The comparison of prices in 1921, however, are interesting as the following figures show:—

	January	December.
Sulphite (No. 1)	£55	£20
Easy Bleaching	42½	14½
Sulphite (Strong)	37½	12
Unbleached Soda (No. 1)	37½	11
Soda Kraft	33	11
Groundwood (wet)	10	5½
Groundwood (dry)	20	11

Prices prevailing today are nearly double those of 1913 in some cases, owing to high cost of production and other elements.

The Paper Industry.

It would be invidious to try and give a comparison in the prices of papers placed on the British market. We have Canadian, Scandinavian, German, Finnish, American, French, Belgian, and home produced papers all in competition. It is said that Finnish papers can be sold at £10 a ton with a good profit—that is newsprint. Indeed, the prices quoted for papers produced in foreign countries are in some cases absolutely beyond the comprehension of a decent papermaker. We do know that German mills, owing to the subsidy received from the German Government, are enabled to put cheap papers on the market and added to their favor—and Finland's, also—are the depreciations in the rates of exchange. The market for paper is consequently "topsy-turvy"—and it has been so since the beginning of 1921. In British mill circles the conditions are really critical, unemployment is rife, and all sorts of wild-cat schemes are mentioned to stabilize the European money markets in order that the trade and industry of Great Britain may be "got going." We are in an age of economy; we are in an age of science; and we are in an age where our old enemies are getting "their own" back by choking us with their Government subsidized paper. In Finland and Germany mills are busy in many ways; in the United Kingdom they are idle in more ways than one. Some of the mills in England have very depressing reports on their 1921 work. Since 1919 they have been in a vice, with the Government taxing them on one side and the foreigner underselling them on the other. Added to these two elements are strikes and labor grievances.

There is one feature of the British paper industry

that must not be overlooked and that is the Technica Section. It has made great strides, is doing a valuable work and the benefits derived from this work will be reaped in future years.

The Outlook.

A big newspaper publisher who caters to financial circles said to me the other day "Peace in Ireland will make a big difference in the money markets and I predict a change for the better." The peace, however, may settle up the Stock Exchange, as a lot of Irishmen are connected with it, but it may safely be assumed that while cheap paper money is in circulation at home and on the markets of Europe and elsewhere the outlook for trade and industry is not very bright. If Germany can buy pulp in Finland cheaper than any Canadian mill could ever dream of producing it, and produce paper from it and sell the paper in England below what any English mill could ever dream of producing it, where can any country with a decent money standard step in and compete against such a country, as say Germany? That is the position and until it is altered the outlook in 1922 will be a black one in an open market.

"ONE INCH SQUARE."

(Courtesy The Wrenn Paper Co.)

You send us a sample which must be matched,
And returned intact, not even scratched.
We must promise exactly to get your shade,
And to use no pigments which may fade,
We would test the color with every care,
But—the sample is only one inch square.

The fibre you say is rag and wood,
Before giving our price, we would make this good.
The bulking, too, must be matched, we see,
We must keep exactly to .003.
But the loading, we fear, we cannot test,
And we have to guess at all the rest,
We cannot try if the ink will bear,
For—the sample is only one inch square.

We notice the paper has to pull,
On the "Leunig" a mean of 20 full,
And the "Mullen" and "Southworth" too, must show.
To full tdvantage their quid pro quo.
But we scarcely can judge e'en the finger tear,
From a sample only one inch square.

Whether pattern is plated, or simply rolled,
If it shrinks or stretches, in heat or cold,
If it folds one hundred or only ten,
And will stand the rubber, as well as the pen,
These matters, we fear, can only be guessed,
For we cannot apply a single test,
And think, perhaps, it was scarcely fair,
To send us this sample one inch square.

W. B. Greeley, chief of the United States Forest Service, in his annual report made public last week, expresses the opinion that wise handling of the Alaskan forests will result in the development there of a paper industry "as permanent as the paper industries of Scandinavia and capable of supplying a third of the present paper consumption of the United States." This, he adds, "is an opportunity which should not be thrown away by inviting unrestrained and destructive exploitation."

Section

'ellstoff u. Papier, i, 5, (1921).—The carboxyl group f oxycellulose is determined as follows: 2 g. of air lry fiber in 50-60 cc barium hydrate solution are allowd to stand 4 hrs. in a closed vessel. The fiber is then ucked dry, washed with distilled water till the washngs are free from barium, and ashed. The barium is letermined in the ash as barium sulphate. The per.ent of barium in exycellulose prepared by various neans is given. Oxycellulose prepared by the use of bleach is very high. The method is longer than the itration method of Schwalbe and Becker.—H.E.W.

D-4. Pulp Grinding Stones. Anon. **Papier-Fabr.,** xix, 777, (July 29, 1921). The author mentions the German sources of stones suitable for use in pulp making, the properties of the stones and discusses the relation of quality of stone to that of the pulp they yield. The relation of the bonding agent in the stone to the nature of the liquid used in the artificially and particulars concerning these stones are given. The mountngs for the stones and the care to be exercised in usng them are mentioned.—H.E.W.

E-4. Modern Sulphur Burners and the Preparaton of Sulphite Liquor for Pulp Mills. Papir-Journalen, No. 3, (May 31, 1921). Many practical difficulties are met n the preparation of a good sulphate-free liquor. One f these, the formation of sulphur trioxide (SO_3) in the ulphur burners), is avoided by a new system whereby xidation in the presence of iron is reduced to a practical minimum.—P.B.

E-5. Consumption of Steam in Cooking and Drying Sulphite Pulp. Papir-Journalen, No. 12, (Sept. 3, 921). As regards steam consumption, the cooking of strong pulp is more economical than the cooking of asy bleaching pulp, namely about 2 kg. of steam per g. of pulp in the first case, and 2.2 kg. in the second. —P.B.

E-5. Cooking wood (by the sulphite process). C. G. SCHWALBE. **Zellstoff u. Papier,** i, 11, (1921). The eduction of shredded wood with chlorine is effected nly under 5 to 6 atmospheres pressure when 30 per.ent of the reagent on the weight of the wood is used. The hydrochloric acid formed must be reconverted into chlorine. The use of chlorine or chlorine dioxide in organic solvents is not economical. In the first 8 hrs. of the Mitscherlich cook the ash content of the wood rises from 0.48-1.8 percent. Lignin dissolves in the last stages of the process. After the fifth hr. the methoxyl content is one-fifth less than at the outset, and rises after the eighth hr. to its original value. Hexosans dissolve first but pentosans are very resistant. The economic use of old and fresh wood are mentioned.—H.E.W.

E-0; F-0. Problems of Heat in the Pulp Industries Svensk Pappers-Tid., No. 8, (April 30, 1921). The exact expenditure of steam in modern mills is traced at length. A careful comparison is made of old and new processes of cooking sulphite and sulphate pulps, of the number of calories consumed both in cooking and in the formation of by-products; similarly in drying, reducing the quantity of water in the liquor and in the pulp, and on the basis of economy.—P.B.

F-2. Production of Soda Pulp with the Simultaneous Recovery of Chemical Compounds from the Waste Liquor. Svensk Pappers-Tid., No. 14, (1921). The recovery of valuable products from the waste liquor has hitherto yielded insignificant results, because in most cases the liquor contains sulphur compounds. A new cooking process, in which sulphur is not employed, has been worked out with the results that while the quality of the pulp has not deteriorated, the recovery of useful matter has been facilitated. The new process is not more expensive than the old soda process. The quantity of waste is considerably greater, reaching 100 kg. of methyl alcohol and acetone, and 100 kg. of oil per ton of pulp. The new process is also free from odor. One of its advantages is that it can be employed for the production of chemical substances when, for any reason, the mill is not turning out cellulose.—P.B.

G-9. Formation Roll. ALBERT BUCHGRABER, Ger. patent No. 338,332, Class 55d. **Papier Ztg.**, xlvi, 2347, (July 26, 1921). An arrangement by means of which sheets of pulp can be automatically removed from the formation roll is patented. Air is blown out of the roll at the right point with respect to the revolution, and the end of the sheet is directed by means of compressed air between two press rolls, one of which is provided with scraper for the removal of the sheet. The holes in the rolls are sufficiently small to prevent pulp from entering.—H.E.W.

K-7. Beater. K. A. THORSEN, Ger. patent No. 339,232, Class 55c, Group 4. **Papier-Fabr.**, xiv, 786, (July 29, 1921). Beater in which the bed plate and roll may be pressed against each other with pressures which can be regulated.—H.E.W.

K-10; K-18. Sizing of Boards. Pappen u. Holzstoff Ztg., No. 34, (July 28, 1921). The author discusses the practical difficulties of sizing paper and boards, and describes in detail the method of engine sizing.—P.B.

K-10. Rosin Sizing. R. SIEBER. **Zellstoff u. Papier**, i, 15-19, (1921). The author investigated the precipitating power of alum in the presence of free rosin suspension prepared by dissolving rosin in alcohol, and adding the solution to water. The precipitating power of the various salts follow the regular rule, trivalent aluminium and iron exerting stronger action than the monovalent elements. The analysis of the precipitate showed the presence of both cations and anions. The simultaneous action of several electrolytes is less than the sum of the action of each acting alone. Rosin suspensions are stable in the presence of hard water.—H.E.W. (For complete translation see **Pulp and Paper**, xix, 1051-1052, Oct. 13, 1921.)

K-12; N-4. Saving Steam in Drying Machines. K. L. Thunholm. **Svensk. Pappers-Tid., 24, 132-134.** (April 15, 1921). Of the steam consumed in the pulp and paper industries considerably more than half is employed for drying purposes. The economy of steam is therefore of great importance. Hitherto, efforts have been concentrated on reducing as far as possible the quantity of water in the pulp before drying, and proportionately the quantity of steam required. Factors in any correct estimate of cost are based first on an exact knowledge of the physics of evaporation in the presence of air, while degrees of drying of the sheet is not the only problem. Experiments on the steam consumption of a dozen machines of different types and capacity showed great variations, reaching from 1500 to 6500 kg. of steam per t. of dry pulp. As the consumption of steam is much greater in winter than in summer—the steam used in heating the air being 1200 kg. in winter and 600 in summer—it was found that prewarming the air effected a great economy. Also, the air coming in contact with the sheet should be as dry as possible. A device is described for saving steam: it consists of several elements or accumulators, supplied by the waste heat and moisture which contain practically all the callories evacuated by the paper machine. At the Orebro Paper Factory it was found that this device effected a saving of 25 percent of steam in winter and 15-20 percent the year round. Improvements promise a saving of 35 per cent.—P. B.

K-12. Ryberg Machine Wire. Papir-Journalen, No. 22 (Dec. 11. 1920). The wire is a device for increasing production by reducing friction and choking, whereby the cost of cleaning with steam is eliminated, as well as marking of sheet. The wire also operates as a drive for the rolls.—P.B.

K-12. Regulation of Machine Wires. Papir-Journalen, No. 7. (May 14, 1921). The wire is operated automatically by means of a sliding plate in connection with a spindle and a bent arm, whereby the rolls are regulated and held in a single position.—P.B.

K-12. The Use of Machine Wires in Board Mills. Pappen u. Holzstoff-Ztg., No. 23. (June 9, 1921). The author gives a detailed description of the strain and wear to which wires are subject. and of the measures essential for their efficient working.—P.B.

K-12. Dryer for Paper. CURT BAUER, Ger. patent No. 339,721, Class 55d, Group 19, **Papier-Fabr.**, xix 880, (Aug. 19, 1921). The paper travels over rolls in a totally enclosed housing. Warm air blows through the channels which are arranged in zig-zag manner. Outlets are provided for the cool air.—H.E.W.

K-23. Safety Paper. POENSGEN and HEVER, Ger. patent No. 338,333, Class 55f, **Papier Ztg.**, xlvi, 2763. (Aug. 4, 1921). The fundamental idea is based on photographic principles and depends on the fact that the papers are sensitive to acids and erasures and that the reproduction of color is difficult.—H.E.W.

K-16. Manufacture of Wrapping Papers. Pappen u. Holzstoff-Ztg., No. 21 and 23, (May 26 and June 8, -921). A cheap and serviceable product is best made out of old papers, carefully sorted and cleaned. The process consists in preliminary treatment in the hollander followed by prolonged heating.—P.B.

K-18. Water Consumption in Board Mills. Pappen u. Holzstoff Ztg., Nos. 16 and 20, (1921). Fresh water is employed only for spraying the cylinder and felt. Estimates of the quantity of water used in the kollergang and hollander are given, with lengthy practical details of manufacture.—P.B.

PULP AND PAPER NEWS

The past year proved a disappointing period for the lumber trade in the Province of Quebec, and particularly in Montreal. Prices dropped almost throughout the year, owing to heavy stocks purchased at high figures and to forced liquidation of these rendered necessary by bank and other obligations. A very large amount of lumber was sold, but the close competition rendered it impossible to get prices which would show cost, to say nothing of profit. The consequence was that many mills and wholesalers had to bear more or less serious losses. The reaction in hardwoods was particularly noticeable. The American market failed to show any vitality, while British exports were down to a low point. Prices are now in a more stabilized basis. Price-cutting has almost vanished, and there there is a feeling of confidence which was sadly absent from the market during the greater part of 1921. Some of the larger pulp and paper companies are also manufacturers of lumber, and these found it difficult to dispose of their production at remunerative prices. The cutting in 1921-22 is likely to be on a smaller scale than in the preceding season.

We are pleased to announce that Mr. J. A. Bothwell, of the Brompton Pulp and Paper Company, is now on the road to recovery. Mr. Bothwell recently underwent an operation in the Sherbrooke Hospital.

Mr. G. S. McCoubray of Iroquois Falls, Ont., has accepted a position as assistant superintendent with the Wayagamack Pulp and Paper Co., Three Rivers, Que.

Mr. E. P. Cameron of the Forest Products Laboratories, Montreal, was a recent visitor at the Abitibi Mill at Iroquois Fall, Ont.

An unfortunate accident occurred at Weymouth, N.S. Tuesday, when Merril Cook was instantly killed when caught between cars which were being shunted on the siding of the Sissiboo Pulp Mill.

U.S. PAPER PRODUCTION BIGGER IN NOVEMBER.

New York, Dec. 27.—"While business conditions are unquestionably far better than they have been in recent months, and the worst of the depression is over, there seems from a survey of the paper industry as compared with general business, to be no doubt that a spirit of conservatism should be maintained," says The Paper and Pulp Industry, the monthly bulletin of the American Paper and Pulp Association, the federated organization of the paper manufacturers of the United States.

"Conditions in the paper industry, in all its branches, can be said to justify the statement that this industry has entirely liquidated, but there is no reason for undue optimism on this account, for any recovery of business will be slow, particularly until after the inventory and holiday period. Some pulp mills have sold up their output for a year at present prices.

"Orders and production in the fine paper market experienced steady gains during the fall months. Operations advanced from a 50 per cent. level in September to a 75 per cent level in November.

"Early in December the volume of orders declined somewhat as is customary just before the inventory period. Nevertheless, manufacturers feel reasonably assured of a resumption of demand in fair volume immediately after the first of the year as there is a general understocked condition straight through from the consumer to the paper manufacturer.

"After the first of the year there should be a tendency to increase these stocks, but the movement will probably be very cautious."

[redacted]

that the press can control legislation."

The witness made no suggestion as to the rate of duty, leaving that, he said, to the judgment of the committee. He added that the industry did not ask for the same protection as given other paper, because "past experience has convinced us of the futility of such a request."

Colonel Haskell told the committee that the prohibition of the export of wood pulp from Canadian Crown lands and the placing of paper on the free list halted "the steady growth of the American newsprint industry." Development of the Canadian industry followed the witness said "production growing from 161,000 tons in 1910 to 883,000 tons in 1920. Imports from Canada were given at 80,000 tons in 1910, and 680,000 in 1920. Besides Canadian competition, the witness added, large supplies were coming in from Germany, Finland, Norway and Sweden at prices ranging from $10 to $20 a ton less than the cost of production in the United States. This has contributed, Col. Haskell added to "what in many ways is the most critical period in the history of the industry."

Case for Publishers.

Opening the case for the publishers, Wm. J. Pape, publisher of the Waterbury, Conn., Republican, said the question before Congress was whether the publishers of the country shall have again imposed upon them such a condition as found by a Senate investigating committee which reported on June 5, 1920, that "certain manufacturers have taken advantage of this shortage (of newsprint) to exploit the purchasers of such paper, and hold them up for excessive unreasonable and wholly unfair prices."

Discussing what he termed the "monopolistic aspects of newsprint manufacture," Mr. Pape said, "strange as it may seem, publishers, who as a class largely dominate public opinion affecting business policies through direct appeal to their readers, have been po-

tentially weak when fighting for a fair price for newsprint."

"In the past ten years," he added, "there have been at least three grave crises caused by the exploitation of this commodity. Each time the price has soared to undreamed of heights."

What he termed "suppliers' propaganda" about a shortage in 1919 and 1920 caused publishers to turn to Europe for newsprint in quantity, Mr. Pape said. In 1920, publishers, he continued, accepted "the suppliers' propaganda, and in a panic became the victims of some manufacturers and their brokers who took all the traffic would bear."

GERMAN NEWSPRINT COST IS MODERATE.

Advance by German cellulose manufacturers of 81 per cent, in price of their product is not likely to affect price of newsprint coming from that country to American markets to any appreciable extent, says the Wall Street Journal. "Cellulose" corresponds to our sulphite pulp. Berlin cables early this week said the association of cellulose manufacturers had advanced prices to paper manufacturers, which would probably results in considerably higher advertising rates in Germany next year.

Last July, German manufacturers and publishers, under a trade agreement, fixed a price of 3.3 marks a kilo of newsprint paper, which still obtains, and which, on the basis of a mark equivalent to one-half a cent, equals $15 a ton.

Prices today, determined by the Union of German Pulp Makers, are 3.1 marks at kilo for cellulose, equal to $14 a ton, and 2.0 marks a kilo for ground wood, equal to $9.00 a ton.

Using these figures, the following compilation gives approximate cost of a ton of paper in Germany. The proportions of ground wood and sulphite used are the stanrds of American manufacturers:

	Per ton.
Ground wood, 80 per cent	$7.27
Sulphite (cellulose) 20 per cent	2.80
Estimated conversion cost	5.00
Total	$15.07

Thus with $2.80 worth of cellulose or sulphite going into manufacture of one ton of newsprint, an advance of 81 per cent. in prices would increase cost of manufacture of finished product by only $2.27, bringing total from $15.07 to $17.31.

In estimating cost of producing ton of paper, manufacturers usually add 50 per cent. of cost of sulphite and ground wood for conversion of raw product into paper.

If 1921 has been a year of trouble it has been a year of achievement too and long after we have forgotten its trials we will remember its loyalties. Here's to the men who came through.

It is good to feel that the big difficulties are behind us and that the way ahead is clear. It is good to welcome the new year with confidence and courage and faith in a future of promise. It is good to enter into this new year in association with you.—From the Christmas Greeting of the Hammermill Paper Co.

It is easy to take a day off but it is impossible to put it back.

A NEW YEAR RESOLUTION.

The House by the Side of the Road.

By SAM WALTER FOSS.

"There are hermit souls that live withdrawn
In the peace of their self-content;
There are souls, like stars, that dwell apart,
In a fellowless firmament;
There are pioneer souls that blaze their paths
Where highways never ran;
But let me live by the side of the road
And be a friend to man.

"Let me live in a house by the side of the road,
Where the race of men go by,
The men who are good and the men who are bad.
As good and as bad as I,
I would not sit in the scorner's seat,
Or hurl the cynic's ban;
Let me live in a house by the side of the road
And be a friend to man.

"I see from my house by the side of the road,
By the side of the highway of life
The men who press with the ardor of hope,
The men who are faint with the trife.
But I turn not away from their smiles nor their tears
Both parts of an infinite plan;
Let me live in my house by the side of the road
And be a friend to man.

"I know there are brook-gladdened meadows ahead
And mountains of wearisome heights;
That the road passes on through the long afternoon
And stretches away to the night.
But still I rejoice when the travellers rejoice,
And weep with the strangers that moan,
Nor live in my house by the side of the road
Like a man who dwells alone.

"Let me live in my house by the side of the road
Where the race of men go by;
They are good, they are bad, they are weak, they are strong,
Wise, foolish—so am I,
Then why should I sit in scorner's seat,
Or hurl the cynic's ban?
Let me live in my house by the side of the road
And be a friend to man."

A SAD PICTURE.

The New York *Independent* recently published this humorous satire on the growing scarcity of pulpwood:

The Paper Shortage.

(Mss. found written on a piece of bark, A.D. 2200).

The last newspaper ceased publication nearly one hundred years ago. For some time previous to this it had been printed in so fine a type on such tiny sheets that it was necessary to supply subscribers with microscopes in order to make the text legible. A few years later the publication of school books was suspended and illiteracy began to plunge civilization once more into the darkness of mediaeval times. The final blow came in 2160 when even the *Congressional Record* went under. All the old libraries had long since been repulped to get it out, so there was not a book left in the world, save a few museum specimens. Such traces of culture as remain are maintained only by the phonograph and the moving picture. I, alone, remember how to write and now I die! After me the deluge!

UNITED STATES NOTES

A special course in forestry under direction of the Federal Veterans Bureau will be instituted at the New Hampshire College, Durham, N.H., beginning January 4. The first class is to be made up of a score of men to be assigned by the New England district office of the bureau and will last eighteen months, including about five months under direction in the forests of the State. The men will be trained as rangers, fire wardens, timber estimators and foremen and superintendents in forestry service.

The Oakland Paper Mill, at Manchester, Conn., a branch of the American Writing Paper Company, reopened last week after having been closed nearly a year. The company put to work all its former employees. It was said that enough orders are now on hand to keep the mill in operation for some time to come.

In an effort to arrive at an agreement on wage decreases proposed by the manufacturers, representatives of the International Brotherhood of Paper Workers and paper men from eleven large paper manufacturing companies last week presented their cases to the strike arbitration board in New York City. This board consists of three representatives of the manufacturers and three members of the union, with Judge Frank Irvine of Ithaca, presiding. The manufacturers contend that there has been no appreciable reduction in wages since the peak was reached during the war, and that without a reduction there can be no reduction in the cost of newsprint. Under the employers' proposal the wage of laborers would be cut from 40 to 30 cents an hour and other crafts reduced proportionally. John P. Burke, president of the International Pulp, Sulphite and Paper Mill Workers, stated that the paper makers have already accepted a cut of from 10 to 26 per cent in arbitration proceedings last August. He said that another cut is not justified as there has been no subsequent reduction in living costs. Mr. Burke claims that the strike against the International Paper Company, which is not a party to the present wage agreement, is being waged successfully by the union men. The International is operating its plants on the "open shop" plan, having declined to deal with the union since the break with the latter last Spring. "We have been waging a successful fight against the International Paper Company since last May," said Mr. Burke. "We have 7500 men out on strike. We had a meeting in Albany recently, and voted to give the International Paper Company strikers all the financial and moral support necessary to win the strike." A final hearing on the proposed reduction will be held Jan. 4, at which time a decision will be rendered by the arbitration board.

Preparations are under way for celebrations with elaborate ceremonies to mark the formal opening in February of the Government railroad in Alaska. Driving of a golden spike in the presence of representatives of Chambers of Commerce of many Pacific coast cities will open traffic between Seward and Fairbanks. An excursion over the entire system is planned and the principal towns in Alaska are preparing to celebrate the event.

In discussing the forest problem before the Schenectady Section of the American Institute of Electrical Engineers last Thursday, Dr. H. P. Baker, executive secretary of the American Pulp and Paper Association, proposed that municipal forests be created as a means of relieving the unemployment situation. "Forestry is used in Europe as a means of handling the unemployment problem year after year," said Dr. Baker, "and America needs the municipal forest which would at the same time produce a valuable crop, avoid the economic waste of idle land, while providing employment for large numbers of men." Dr. Baker pointed out that there are in the United States to-day 81,000,000 acres of "loafing" land, an acreage so cut over that artificial restocking is necessary, and yet this land, if properly put to work, would provide enormous quantities of timber for the wood using industries. Dr. Baker said that there is pending in Congress at the present time legislation initiated by the American Paper and Pulp Association in cooperaton with the American Newspaper Publisher's Association, the American Forestry Association and other national organizations which would insure the country's future timber supply. These measures, he said are along the lines of his suggestion. Dr. Baker told of the beginnings of municipal forestation in New York State, at Newburgh, Malone and other cities which are annually planting municipal forest tracts.

Chattanooga, Tenn., has been selected by interests back of the Southern Cotton and Paper Company as the site for the projected plant of this recently organized concern. For a time it appeared as though Nashville would be decided upon as a location for the mill, but largely through the eforts of C. W. Howard, director of the Chattanooga commerce chamber's industrial bureau, Chattanooga won out. Mr. Howard helped materially to bring about the subscription of the last third of the company's stock issue, thus assuring the capital needed to start construction work. Nashville bidders had offered a big bonus to get the industry, which is expected to develop into an important factor in the South. The company is capitalized at $200,000 and it will make paper from cotton linters, using the Reynolds process. The Chattanooga plant will have a capacity of ten tons daily of book paper, or fifteen tons of writing paper.

A new record for handling wood at its docks in Ogdensburg, N.Y., was made during the past season by the Ogdensburg Wood Company, 51,085 cords of wood were unloaded in all, exceeding by 1,013 cords the record of 1920. Data prepared by the officials of the company shows that the open shop system under which the terminal was operated last season proved of advantage to the company. The average number of men employed per boat was 35.8 as compared with 35.5 in 1920, yet the average number of cords unloaded per working hour was 18.9 cords per hour more than in 1920 when the union handlers were employed. The figures also reveal the fact that the boats lay at the docks only 2,105 hours as against 3,416 hours in 1920, and actual working hours amounted to a total of but 761.65 as compared with 1,039.75 in 1920,

The Markets

CANADIAN TRADE CONDITIONS.

Montreal, December 27.—The holidays have interfered with business to some extent. Men's minds are naturally diverted, to a certain degree into other than trade channels, and we can expect no pronounced activity until 1922 is with us. There is, however, an optimistic feeling abroad—men are looking forward with confidence to brighter conditions, inspired with a belief in a revival of trade in Canada, partly due to the settlement of those outstandng political problems which proved so disturbing in 1921. It is of course dangerous to get into the region of prophecs—so many apparently well reasoned opinions as to market conditions have gone astray that it is better to refer to general tendencies than to venture on definite statements.

The indications are that with a return to better world wide conditions pulp and paper will again come into their own. No one wants to see a repetition of that runaway market which induced so much previous speculation, and which would again take commodities out of sight. A steady stabilized condition is what is desired, as being the best, in the long run, for all classes of the industry.

Considering the universal depression, the manner in which Canada came through 1921 was a tribute to her sound financial position and careful business management. The enormous liquidation of various commodities, the fall in prices, and the decline in purchasing power involved problems which have been, and are being, surmounted, and give confidence for a still further strengthening of Canada's domestic and foreign position in the world of commerce.

PULP.—Business in almost every grade is on the quiet side, but there are hopes that consumption will appreciably increase, and that prices will strengthen, especially in those lines where the margin is down to very small proportions.

FINE PAPERS.—To quote the words of one of the officials of a company making this class of papers, "Trade is improving steadily; I believe that the stocks of jobbers are low, and that there is ground for the belief that business will continue good."

BOOK PAPERS.—In this section orders are coming in well. There is no rush, but the demand is sufficiently strong to keep the mills busy. The only drawback is that orders are required to be immediately filled, for the most part.

BOARDS.—This market continues to be spotty; the turn of the New Year will probaby see a stronger demand.

ROOFING PAPERS.—At a prolonged meeting of manufacturers of patent roofing the entire trade position, including that of raw materials was discussed. The price of felts remains unchanged.

RAGS AND WASTE PAPERS.—The supply of rags is not above requirements, although there is a tendency for more rags to come in, owing to the needs of people, who failing regular employment, are willing to earn money by collecting rags. The demand for waste paper in Montreal is still in excess of the supply.

NEW YORK MARKETS.

New York, December 24—(Special Correspondence)—It is customary for activity in the paper industry to slow down during the final couple of weeks of the year, and the present situation is quite characteristic of this season. Demand for paper during the past few days has been narrow, buying has been almost solely to cover immediate needs, and the trade has been marked by a pronounced degree of quietness. Reports from manufacturing centres generally tell of mills closing down over the holiday period and to take inventory, and paper manufacturers seem more concerned at the moment with stock-taking and other matters attendant to the end of the year than in absorbing additional supplies of raw material, with the obvious result that the raw material markets also are experiencing dullness.

The paper market as a whole continues fairly healthy. The easing off of demand recently has failed to worry manufacturers or dealers, who readily appreciate that this condition invariably develops at this period of the year. There is a feeling of decided confidence regarding the outlook. Nearly everyone in the trade looks for good business soon after the turn of the year, and there are numerous signs that expectations on this score are going to be realized. Some kinds of paper have had a very satisfactory pre-holiday demand. Newsprint has been in active demand and the market for this grade of paper has strengthened its position immensely. Kraft wrapping paper has sold in large volume, and tissue papers have been in excellent call. Indications are that it is only a matter of a short time when demand for other kinds of paper will begin to expand very appreciably. Book paper, for example, should find a much broader market during the next few weeks. The publishing business is reviving, due to a steady growth in advertising, and the probabilities are in favor of magazine and other periodical publishers coming into the market for increased supplies of book paper shortly. The usual early-in-the-year improvement in demand for box boards doubtless will develop during the next month or so. Paper box manufacturers seldom if ever stock up with board to any extent, and they are likely carrying less board today than ordinarily, so that a much better movement of boards is in prospect soon after the holiday season. Fine papers also are due for considerable improvement. General business is on the mend, and as manufacturers and merchants become busier, they will use larger amounts of writing papers. The fact should not be lost sight of that the leading field for the consumption of fine papers is business concerns, and it is but logical to expect that business men the country over will not spare paper during the coming months in an effort to obtain business for themselves.

Statements by postal department authorities in Washington, as well as locally, that the Christmas mail has exceeded all records this year is an encouraging sign. This means that there has been a heavy consumption of fine papers recently, and that stocks will have to be replenished after the first of the new year.

Consumption of newsprint has been comparatively heavy, and gives promise of continuing so during the remainder of the winter. There are other indications that consumption of various kinds of paper is on the rise, which, after all, is the basis of good business for the paper producer and dealer, and which should make everyone in the paper trade an optimist on the eve of a new year.

There have been no changes of importance in market conditions this week. Prices on the various kinds of paper hold at about previous levels and jobbers report having less difficulty in obtaining the prices quoted. Consumers are showing that they are willing to meet the figures asked if in need of paper, which proves that it is not price that holds up trading at present.

GROUND WOOD—While current demand for ground wood is spotty and in the aggregate of light volume, volume, there is a firm tone to prices. Sales of prime spruce ground wood for spot shipment have been reported in some cases at as high as $46 a ton delivered consuming mill, which it must be admitted is an attractive price for ground wood. Another sale of note locally was a lot of foreign ground wood, held on the spot here, for which the importer obtained $36.50 a ton ex dock. This price is slightly above average quotations on foreignmechanica l pulp, between $33 and $35 being about the prevailing market ex dock at Atlantic ports, but the instance cited shows how high consumers will go when in need of pulp. Domestic prinders are quoting at anaverage of $32 per ton f.o.b. grinding plants, with prices figuring out from $40 upward delivered consuming points. A bullish feature about ground wood is that unsold stocks are limited, probably a good deal more so than ordinarily at this time of the year. This causes grinders to be more or less independent regarding prices and keeps them from pressing supplies onto the market.

CHEMICAL PULP.—The chemical wood pulp market lacks feature at the moment other than prices rule quite firm. Papermakers are coming into view as buyers when immediately in want of pulp, but otherwise they are doing little buying, and the market rules quiet. Domestic producers appear to be fairly well sold up, however, and importers seem to have liquidated the bulk of their holdings on this side of the Atlantic, with the result quotations are firm and no one is pressing consumers to buy.

Importers assert that there is small likelihood of prices on Swedish pulps going back to the low levels obtaining a short while ago. The higher rate of exchange in itself will prevent this, it is claimed, while manufacturers in Sweden are reported stronger in their views and to be insisting on higher prices. There have been sales of Scandinavian kraft pulp this week at 2.75 cents a pound ex dock New York and Baltimore, an dit is stated that this is about the bottom figure at which foreign kraft is now available. Domestic kraft is quotably steady at between 2.75 and 3 cents per pound at producing mills, with those producers making an extra strong No. 1 kraft freely receiving 3 cents for their pulp. Bleached sulphite is in steady demand and firm in price.

RAGS.—Paper manufacturers are showing very little buying interest in rags at present. This is not surprising when it is understood that most mllls are occupied in taking inventory and therefore are more desirous of reducing stocks of raw material than in augumenting them, and dealers say that their offerings to consumers seldom result in sales. Occasional transactions are of course being accomplished, but these comprise about all of the business that is passing, and some grades are moving in such light amounts that no established prices exist.

Roofing stock is still the most actively sought class of rags, and this is not saying much becaue there is no concerted movement of any grade. Felt paper mills are absorbing some quantities of No. 1 satinets at about 90 cents a hundred pounds f.o.b. New York, and No. 2 satinets at 80 cents, and signs are not wanting that certain felt manufacturers are quietly laying in stocks of such rags against forward requirements. Old whites are in little demand, and there is practically no interest shown by buyers in thirds and blues. New cuttings are quiet, with dealers quotations ranging around the following levels: No. 1 white shirt cuttings, 10 cents per pound; fancy shirt cuttings, 6 cents; washables, 4 cents; unbleached muslins, 8.50 cents; white lawns, 8.25 cents, and light silesias, 6.25 cents.

PAPER STOCK.—Low grades of waste paper have been in exceedingly slow demand this week, and there has been no material improvement in the better qualities though the latter are steadier in tone and are moving in relatively larger volume than the former. Old folded newspapers are offered to board mills at 45 cents a hundred pounds f.o.b. New York, and are accorded scant attention by consumers, while No. 1 mixed paper at 35 cents a pound at shipping points for No. I hard white, and at around 3 cents for No. 1 soft white shavings. Old magazines are quoted at 1.20 to 1.25 cents per pound and are apparently held in rather light supply. Old kraft is selling at an average of 1.55 cents a pound New York, white news cuttings at 1.65 cents, overissue newspapers at 70 cents a hundred pounds, and No. 1 print manilas at 85 cents.

OLD ROPE AND BAGGING.—Old manila rope is the one firm item in the papermaking material trade. Dealers lay great stress on the short supply of this commodity, and report having no difficulty in obtaining 5 cents a pound or within an eighth of a cent per pound of this price for manila rope in No. 1 condition. Mixed strings also are moving fairly well at around 85 cents a hundred pounds at shipping points. Old bagging is dull, with only spotty sales recorded at between 90 cents and $1 a hundred pounds for No. 1 scrap bagging.

In a brief filed last Wednesday with the Senate Finance Committee, Henry W. Stokes of Philadelphia, chairman of the tariff committee of the American Pulp and Paper Association, stated that America has become the leading paper manufacturing country of the world and to maintain that place the industry must have protection against cheap foreign labor and depreciated foreign currency. The American paper making industry is now a billion dollar one with 818 paper and 322 pulp mills Mr. Stokes pointed out in presenting his brief. During the business depression of the past year, said Mr. Stokes, there was a considerable falling off of the amount of paper manufactured. Some grades are now back to 75 per cent of normal, but many are still below 50 per cent of normal production. Spokesmen for various branches of the industry, except newsprint, gave details as to conditions in their lines. Producers of paper wall board alone urged that their products be put on the free list.



TRADE-MARK
REGISTERED

SOLE AGENTS in the United States, Canada, Mexico and Cuba for

Finnish Cellulose Association, Helsingfors, Finland

comprising all and every Sulphite, Sulphate and Kraft Pulp mill in Finland except one, Manufacturers of superior grades of Bleached and Unbleached Sulphites, Easy Bleaching Sulphates and Kraft Pulps.

—ALSO—



Trade Mark

SOLE AGENTS in the United States, Canada, Mexico and Cuba for

Finnish Wood Pulp Union, Helsingfors, Finland

a combination of the foremost Ground Wood Pulp and Board Mills in Finland, makers of various kinds of boards and dry and wet Brown and White Mechanical Wood Pulp.

Get the most for your money by getting next to our qualities and prices!

WOOD PULP

TRADE MARK

Lagerloef Trading Company, Inc.

NEW YORK OFFICE:
52 Vanderbilt Ave.
Telephone: Murray Hill 4246-47

CHICAGO OFFICE:
1932 Conway Building.
Telephone: Main 1770-71.

INQUIRIES SOLICITED:

NOTE ON BENTONITE.

(Abstract of Report from Winnipeg Free Press, Saturday, Nov. 26th, 1921.

The United States Bureau of Mines has recently issued a report of investigations on the mineral "bentonite." This is a comparatively unknown mineral, and up to recent times has not found much use in commerce but according to the above report the outlook is most excellent that this material will find extensive use.

Use of Bentonite Expanding.

Until recently the uses for bentonite were few and relatively unimportant. These seem to have been principally in the manufacture of the medical dressing, antiphlogistine; in the manufacture of a packing and dressing for horses hoofs; as a retarder in the manufacture of gypsum wall plaster; as a filler in the manufacture of paper (at a mill in Denver) as a filler in soap; and as an adulterant in drugs and candies.

Within the last few years the unusual properties of bentonite have attracted considerable attention and systematic research has been undertaken to study this material and to develop the best methods for its utilization. The forest Products Laboratory at Madison, Wis., has made rather exhaustive tests on the use in papermaking of a high-grade variety of light yellow, colloidal. Wyoming bentonite, known as wilkinite. Their tests seem to show that the addition of small amounts of bentonite to the clay used as a paper filler greatly increases the percentage of filler retention in the finished product. Thus, in one test the retention with clay alone was 45 per cent; with 10 per cent bentonite and 80 per cent clay, 64 per cent; and with 100 per cent bentonite, 84 per cent. Some paper companies that have tried out this material claim the additional advantages of complete suspension in water and the production of a paper of superior "feel."

LIQUOR INTERESTS AND THE CITY PRESS

The liquor interests in Canada centre chiefly in the cities. The newspapers with largest circulation are in the cities.

Some of these papers do not favor the drink traffic, some do. To what extent, if any, the latter is due to the influence of the liquor interests, its advertising patronage, etc., is known to the papers themselves.

But the point to note is that when any of the great city papers oppose prohibition, it is well to remember that the reasons given may not be facts. Strong drink sometimes makes men "see things" even when they do not drink it. Concerning this, the "*Dearborn Independent*" says:—

"If one confines his reading to the New York press, he is very likely to become imbued with the idea that prohibition has been an utter failure in America. These newspapers say that it is and will continue to be a failure.

"They admit complacently that they do not believe the laws regarding liquor will ever be enforced, and in their comments on the subject and the encouragement which they give the lawbreakers make it very evident that they hope this lawlessness will prove to be such a problem that the United States will surrender in disgust to the criminal interests.

"On the other hand, one may find in the smaller newspapers of the country the chapters of a far different story. From reading these it become evident that whereas all New York sees is the violation of the law, there are other parts of the United States which find that prohibition has brought many blessings."

No. P. & P. 143

Let It Alone



It's only a screen guard at the drier end of a paper machine. But it may save you from a serious injury.

Keep the Guards in Place So They Can Protect You. That's What They are For

National Safety Council Paper and Pulp Sections

Members May Secure Additional Copies at Cost

Scandinavian American Trading Co.

50 E. 42nd STREET TELEPHONES 8311 8312 1813 MURRAY HILL NEW YORK

We buy all kinds of Canadian WOOD PULP AT TOP PRICES. Write us and be Convinced.



Link-Belt Chains and Wheels

THE highest standard of quality is maintained for all Link-Belt Chains. They are Canadian made at our Toronto plant where every modern facility is employed to secure perfection.

To the user this means long life, durability (freedom from annoying breakdowns) whether in elevating, conveying or power transmission.

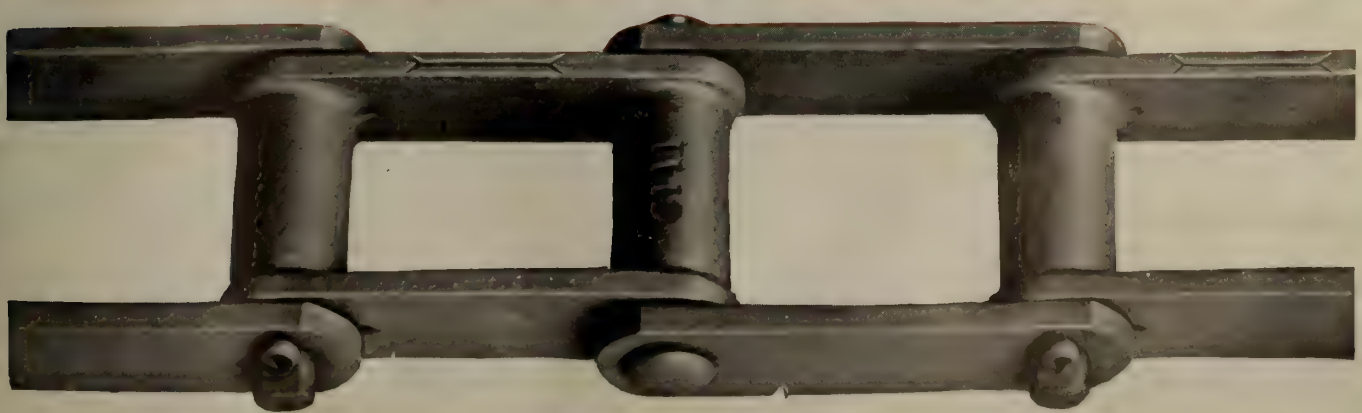
And remember this;—The wheels play an important part in the satisfactory operation of every chain drive—every elevator or convevor.

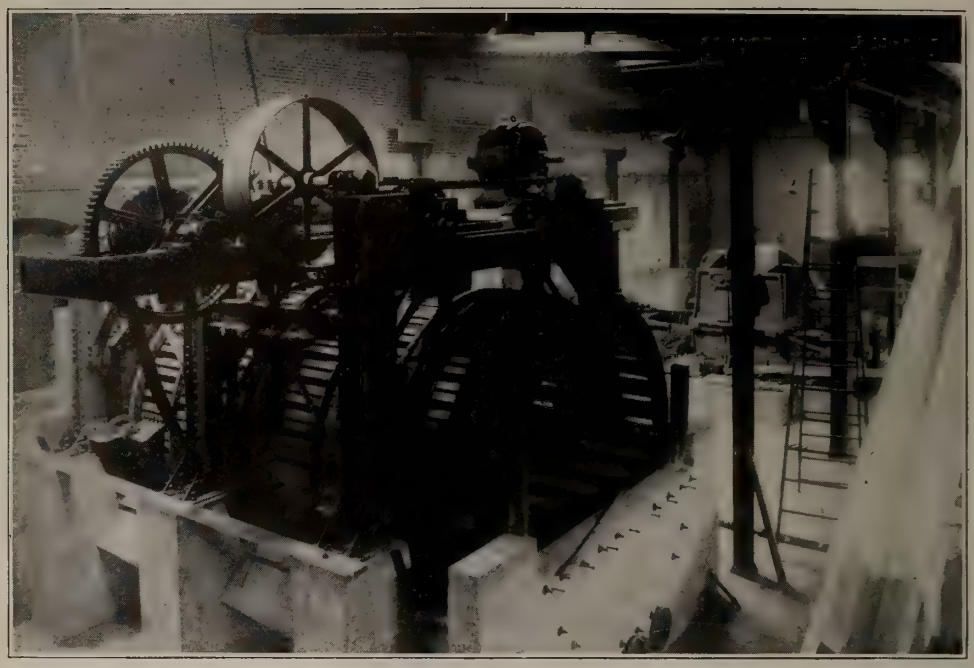
> FLINT-RIM < sprocket wheels last several times as long as ordinary cast-iron wheels. They are made by a special process.

This trade >——< mark identifies Link-Belt products.

CANADIAN LINK-BELT COMPANY, LTD.

TORONTO Wellington & Peter Sts. MONTREAL 10 St. Michaels Lane

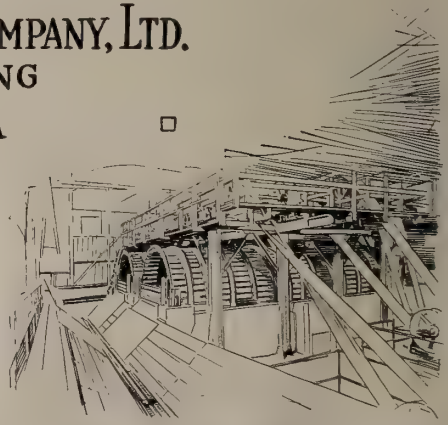




THIS photograph was taken immediately after our installation of a 10 x 20 drum at the Northern Paper Mills in Green Bay, Wisconsin, U. S. A. It is to be used for washing the wood coming from another type of drum.

Whether used in barking, or in perfect washing of wood already barked, our equipment is efficient and dependable. Its sturdiness of construction is obvious from the picture.

CANADIAN BARKING DRUM COMPANY, LTD.
ROYAL BANK BUILDING
TORONTO, CANADA





A section of the U-bar

IT IS seldom a money-saving, labor-lessening process is found to sacrifice nothing in quality of the result. That it is true of drum barking, is due to development of the U-bar construction used in our drums.

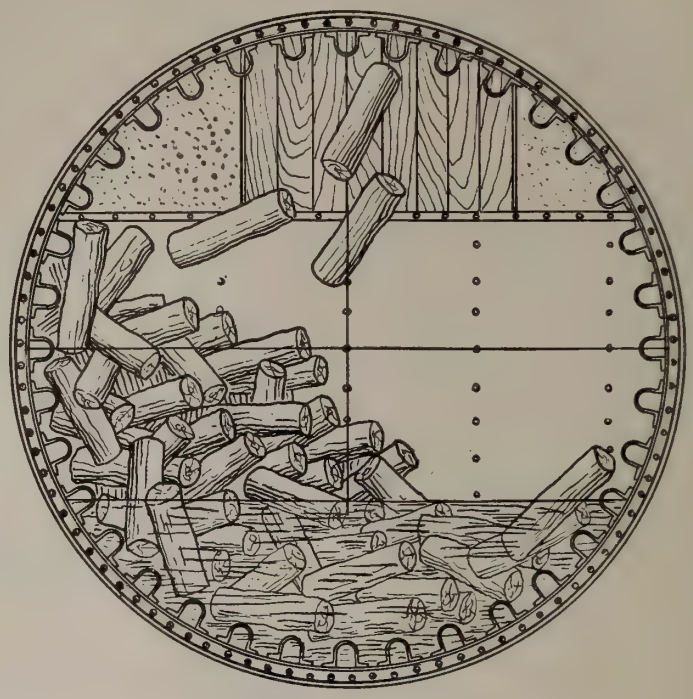
The patented U-bars constitute an inner surface which is a perfect compromise between projections sharp enough to injure the wood, and the smooth plate that permits the log or slab to slip by and escape thorough tumbling.

A section of our U-bar is reproduced. The correct spacing of bars secures constant tossing and tumbling of wood throughout its travel. Yet their smooth, rounded faces offer nothing to bruise the wood.

A big advantage; but a number of constructional superiorities are described and illustrated in the folder we shall be glad to mail to you, on request.



CANADIAN BARKING DRUM COMPANY, LTD.
ROYAL BANK BUILDING
TORONTO, CANADA



EVERY mill man knows the advantages of wet barking. The bark comes off readily when wet. There is no loss of good wood, because nothing but the bark comes off.

It naturally follows that the drum which provides for the most complete and *thorough immersion* of the wood will accomplish the best and quickest barking.

The above illustrates how important a part water is made to play in barking logs or slabs in our drums. Constant, repeated soaking of each piece secures wonderfully clean, complete removal of the bark. No single feature has won leadership for our drum. It possesses a number of very strong points.

We have described many superiorities in a new folder we hope you will request. It contains information of interest to the mill man—and evidence of the most convincing sort.



CANADIAN BARKING DRUM COMPANY, LTD.
ROYAL BANK BUILDING
TORONTO, CANADA

The Barking Drum *from the* investment standpoint—

WHEN mill owners invest in barking drums of our manufacture, their money is secured beyond the fulfillment of mere mechanical specifications. We do not sell machinery, but a specific service which our equipment is in honor bound to deliver.

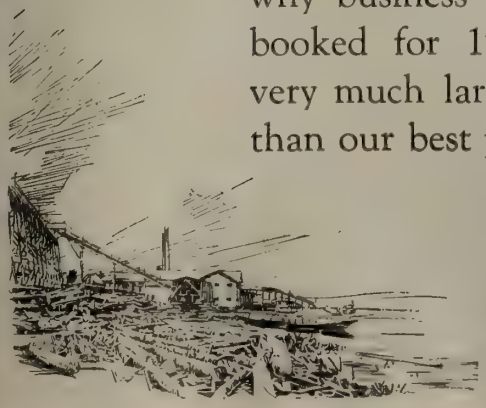
Buy your barking drum of an organization of the age and experience that represent definite responsibility for the product, and its performance. We have sold, and resold, most of the representative pulp and paper mills of this country. Millions of dollars worth of our equipment is in use.

Our interest in an installation is of necessity equal to the purchaser's—with just as much at stake. Our field men travel the year around, watchful of service. We know no other manufacturers in this field whose service organization approximates ours.

This is doubtless a reason why business we have already booked for 1921 points to a very much larger sales volume than our best previous year.

A Few Mills Using Equipment of Our Manufacture:

Spanish River Pulp & Paper Mills, Ltd., Espanola, Ont.
Ontario Paper Co., Thorold, Ontario
Lake Superior Paper Co., Sault Ste. Marie, Ontario
Spanish River Pulp & Paper Mills, Sturgeon Falls, Ontario
Chicoutimi Pulp Co., Chicoutimi Quebec
Abibibi Power & Paper Co., Ltd. Iroquois Falls, Ontario
Wayagamack Pulp & Paper Co., Three Rivers, Que.
St. Maurice Paper Co., St. Gabriel, Que.
St. Maurice Paper Co., Three Rivers, Que.
St. Maurice Paper Co., Charlemagne, Que.
Powell River Co., Powell River, B. C.
Fraser Companies, Edmundston, N. B.
Brompton Pulp & Paper Co., Bromptonville, Quebec
Belgo-Canadian Pulp & Paper Co., Shawinigan, Quebec
Port Arthur Pulp & Paper Co., Port Arthur, Ontario
Donnacona Paper Co., Donnacona, Quebec
Bathurst Lumber Co., Bathurst, N. B.
Fraser Companies, Ltd., Cabano, Quebec
Gulf Pulp & Paper Co., Clarke City Quebec
A. E. Reed & Co., Bishop Falls, N. F.
Fraser Companies, Ltd., Chatham, N. B.
New Ontario Colonization Co., Jacksonboro, Ontario
Three Rivers Pulp & Paper Co., Montreal, Quebec
J. H. Dansereau, Sorel, Quebec



CANADIAN BARKING DRUM COMPANY, LTD.
ROYAL BANK BUILDING
TORONTO, CANADA

WATEROUS
PULPWOOD
MACHINERY



1844-1921

Waterous
BRANTFORD. ONTARIO CANADA

WOOD HANDLING



Haul-Ups and Conveyors

THE proper and efficient handling of logs in and out of storage and through the machines, is one of the biggest factors in speeding up mill production.

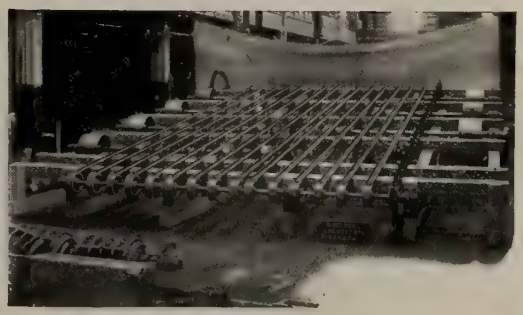
We build—log haul-ups, storage conveyors, pulpwood stackers, barked wood conveyors, that are carefully designed to cut the time and cost of log transportation.

Designed and built in styles, and sizes to fit every special condition. Thirty years experience building conveying systems for the fastest operating mills in Canada is behind them.

Slashers

BUILT in sizes of from one to nine saws, Waterous Slashers are designed and built to stand up to the heaviest work and roughest usage.

Each slasher is fully assembled in our plant before shipment which absolutely guarantees that the machine is going together properly when it reaches the mill.





Stackers

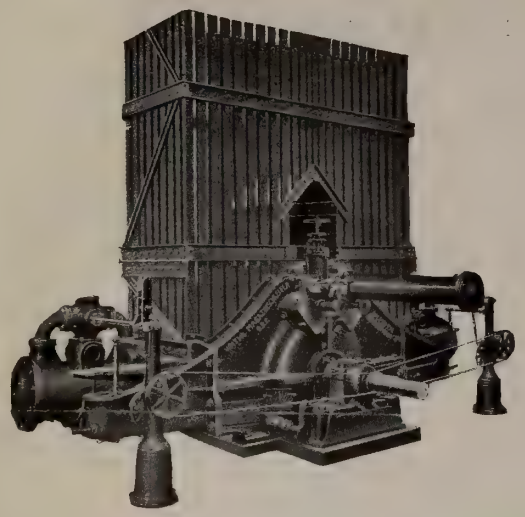
WATEROUS stackers and conveyors are designed for their particular job, thus guaranteeing economy and efficiency. They are built in both stationary and movable types, with end discharge or with discharging skidways at various heights.

Thirty years experience in the manufacture of pulpwood machinery is at your service.

Waterous

BRANTFORD. ONTARIO CANADA

GRINDER ROOM

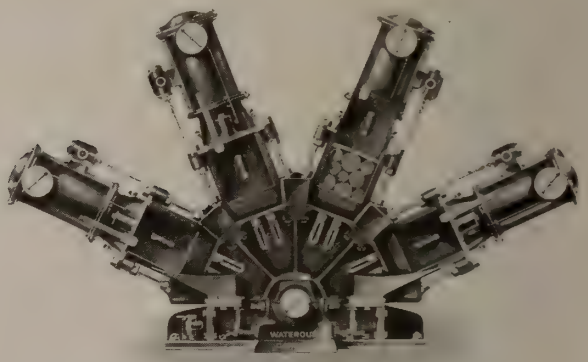


Magazine Grinders

THIS type of grinder is the most economical and efficient method of reducing wood into pulp, that is on the market and is rapidly replacing the old style pocket grinder, in all modern installations.

On account of the exact regulation obtained by electric governors, the power cost per ton of pulp is very considerably reduced, as is the labor cost, two men only being required to attend every four grinders, producing eighty tons of pulp per day.

The Magazine Grinder has a capacity of from 16 to 24 tons per day, depending on the wood and the pulp required.



Four Pocket Grinders

ONE of the most important items in the grinder room is to keep an even load at all times on the water turbines. This is most easily accomplished by installing the Improved Waterous 4-pocket grinder. These grinders are so designed that they may be set on the base of the existing three pocket grinders.



Three Pocket Grinders

MADE with double ends and latticed sides making hanging up and regrinding impossible.

Pockets exceptionally roomy making frequent filling unnecessary.

Pressure swings to follow shift of wood in pocket, but does not allow piston to jam or score cylinder.

Grinders equipped with Waterous special valve that can be *kept tight.*

Fitted also with our patent hydraulic trueing device and Waterous stone burrs.

Built in three styles, Success, New Success, and International.

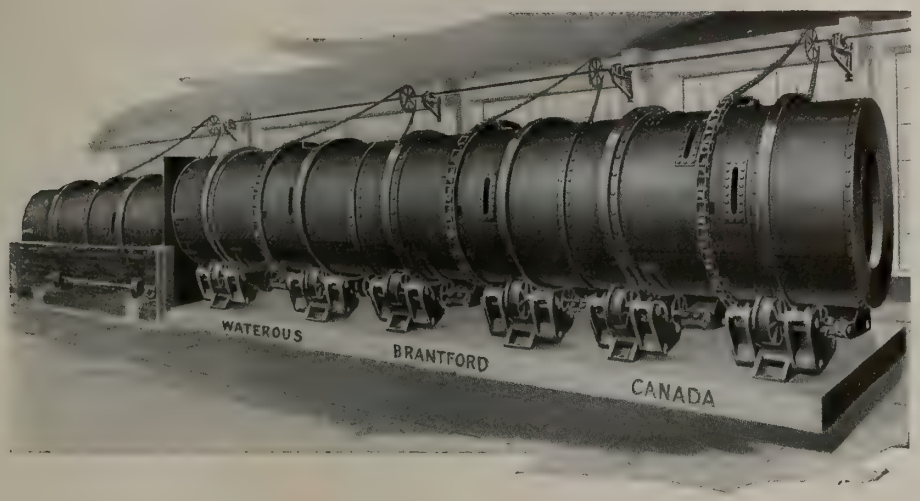
Built to take 16'', 24'', 30'' and 32'' wood.

Over 300 in operation, most of these repeat orders.

Waterous

BRANTFORD. ONTARIO CANADA

WOOD ROOM



Barking Drums

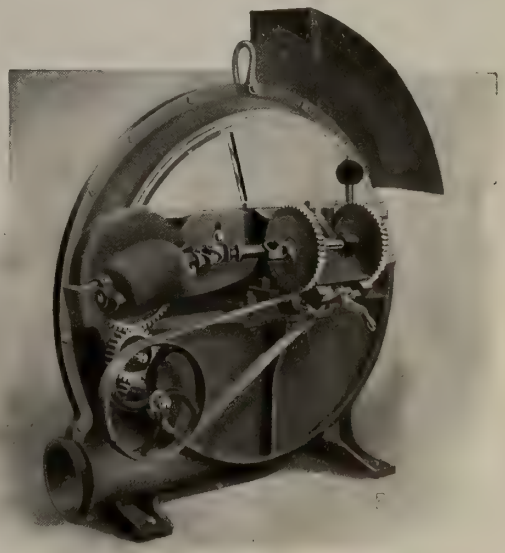
AFTER thoroughly investigating the different types of Barking drums, some of the largest mills in Canada have installed Waterous drums and after keeping accurate records of capacity, upkeep expenses, and general efficiency, have invariably installed additional Waterous Barking Drums.
These drums are not hung on chains, but are supported by steel traction rings running on four swiveled trunnions each, thus avoiding large upkeep expense caused by breaking of chains.
The drums are built of ½'' steel plate which is more capable of withstanding continual pounding than are angle irons or ''U'' bars.
Last drum only submerged so that bark from first three drums may be sent directly to dutch oven.

Barkers

WATEROUS Barkers are exceptionally easy running, rugged and reliable.

Disc is carefully balanced, the rim reinforced with shrunk on steel ring; bearings large and ample lubricated; the knives are easily changed, cleaned and adjusted. Spout can be set to discharge horizontally, vertically or on an incline.

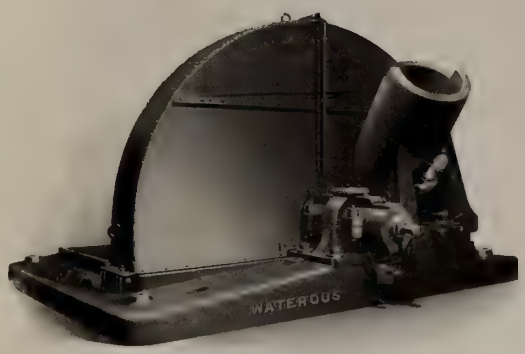
Built in two sizes, 52'' and 60''.



Waterous

BRANTFORD. ONTARIO CANADA

CHIP ROOM

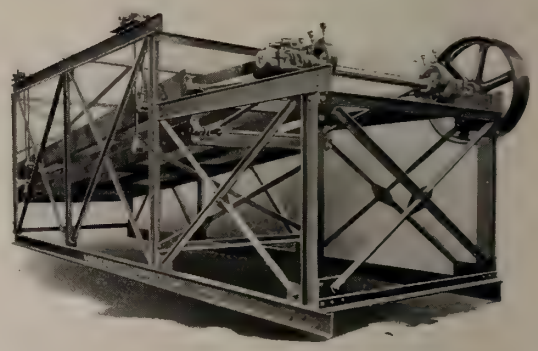


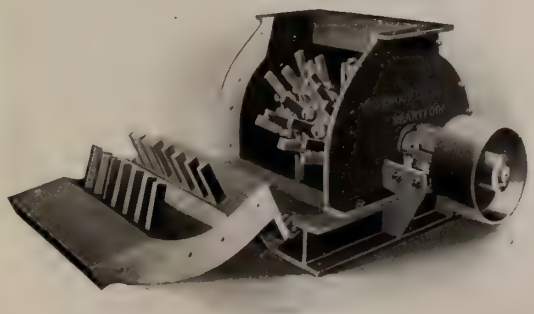
Chippers

BED below main bearing extra deep and of cantilever design, making this most important part the strongest.
Front and rear shaft bearings are ring oiling and cast with thrust bonnet. Both adjustable on base plate.
Bed knife below spout and disc knives adjustable.
All adjustments readily accessible.
Only a few moments required to change knife position to cut different woods.
No other chipper so quick or positive as this. Double angle feed spout absolutely correct to cut block with utmost speed and least power consumption. Chips cut to give largest surface in cooking.

Chip Screens

THE Waterous Reciprocating Chip Screen efficiently removes all knots, large chips, saw dust, and dirt from your chipped wood preparatory to cooking.
They are sturdy and well built machines combining the best of materials, and workmanship with our years of experience as manufacturers of pulp mill machinery.
These machines take very little power and run practically with no noise or vibration. They are manufactured with either all steel or wood frame with capacities from 40 to 100 cords in 10 hours.





Chip Disintegrators

UNIFORMLY, evenly cooked chips are best assured by having all chips of a uniform size. Your large chips can be reduced to uniform size without loss of fibre length and without the production of saw dust, by the use of the Waterous Chip Disintegrator.
Chip breaking pins cannot injure the chip and are hinged to swing out of the way should chips become wedged, thus avoiding a breakage.

Waterous
BRANTFORD. ONTARIO CANADA



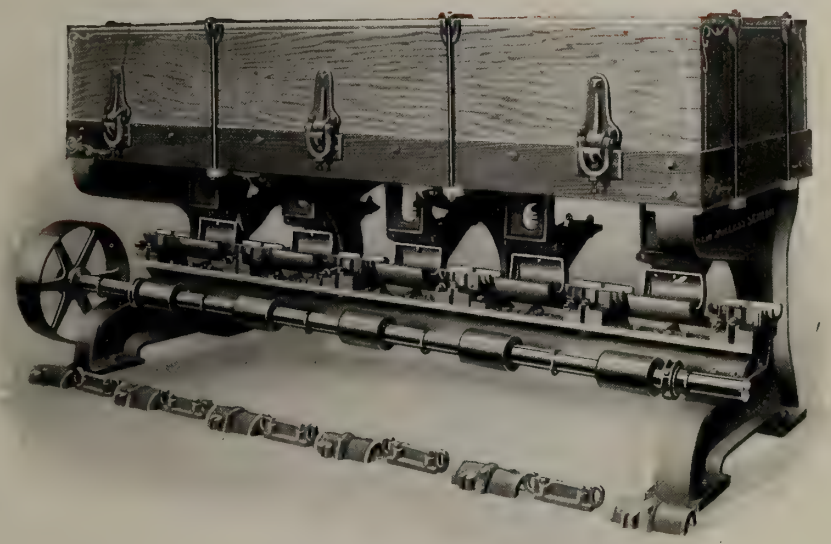
Centrifugal Screens

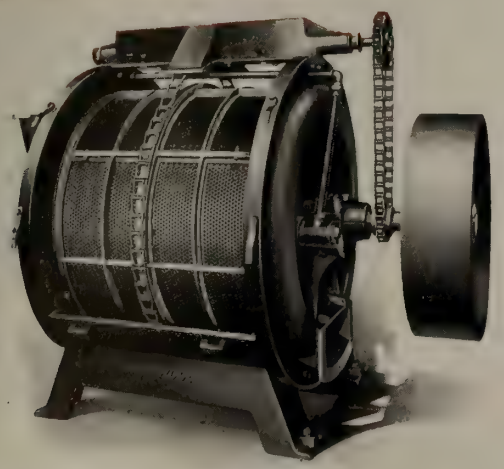
FOR groundwood, sulphite and soda pulp.
On groundwood we guarantee a capacity of 16 to 20 tons in 24 hours through .065 perforations. On sulphite we guarantee a capacity of 20 to 25 tons in 24 hours through .065 perforations.
One Horizontal Quiller Screen will do the work of four 12-plate flat screens. It occupies floor space of less than one seventh of the flat screen installation and costs less than one half. Once the balance of the screening battery is established, the Quiller Screen will run along without further attention.
There is nothing to adjust, nothing to get out of order.

MORE THAN 200 IN USE.

Open Side Flat Screens

THE disadvantages common to this type of screen are largely overcome in the Waterous new open side screens. Cams are of chilled iron and wear slowly and evenly.
They are shrunk and keyed on so that they cannot possibly work loose. Pitmans are spring tensioned to operate without rack and jar. Diaphragms are attached by our special process, which increases their life 50%.
Upwards of 600 Waterous Flat Screens in operation in Canadian mills.



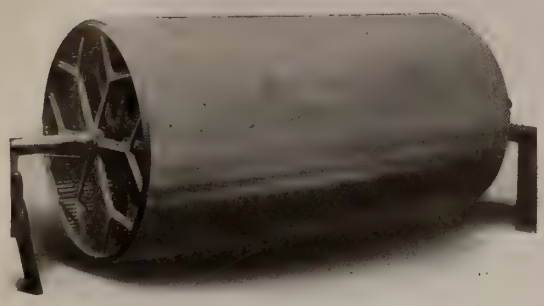


Centrifugal Knotters

THE Waterous Centrifugal Knotter is very similar in design and construction to the famous Waterous Quiller Screen. It will absolutely free the stock from knots, and keep the Tailings free from any good fibres.
Designed and built with Waterous accuracy and workmanship.

Waterous

BRANTFORD. ONTARIO CANADA



Cylinder Moulds

WE manufacture and repair cylinder moulds in all sizes up to 60'' in diameter and 172'' long, in brass or with cast iron spiders for sulphate pulp, also special moulds for special uses.

They are built in a separate department by special machinery and are wire covered by a special process that keeps the wire on tight and true until worn out.

The wire winding is done by automatic machinery in such a way that it cannot slip or wear loose.

Both cloths are sewn by hand, not soldered.

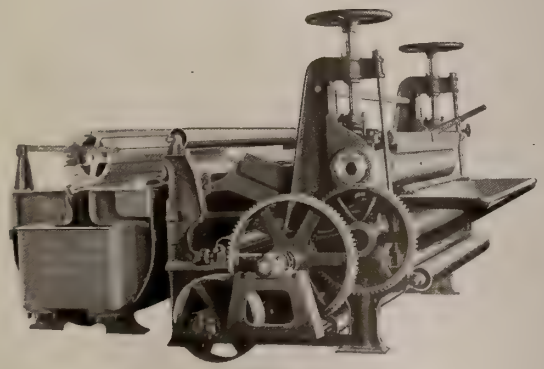
Deckers

THE Waterous Single Cylinder mould type of decker is built in standard sizes carrying a cylinder mould from 28'' to 54'' in diameter and up to 132'' in length, but can be had in larger or smaller sizes to suit purchaser.

We supply wood or all metal vat, as desired. Cut shows metal vat, which has many advantages over the wooden vat, in that it cannot rot and can be kept clean and in perfect condition without trouble; the rounded design of the bottom joint between mould and vat discharge is always tight.

The all metal vat will out wear two wooden vats and perfect alignment of cylinder mould is fully secured.





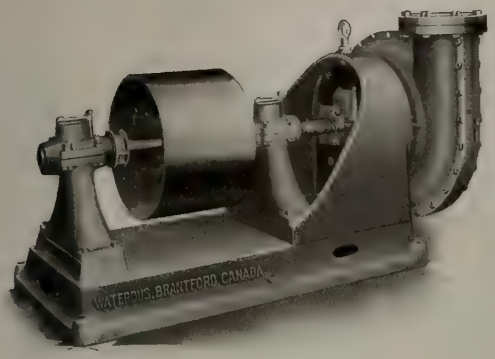
Wet Machines

THE best practise of both Europe and America is incorporated in the design of the WATEROUS IMPROVED WET MACHINE, built in sizes to take cylinder mould up to 36'' in diameter and 93'' wide. Recent improvements include new offset arrangement of the press rolls, a better method of supporting suction box and couch roll, the use of an all metal vat, as well as the introduction of a number of labor-saving devices by which the operation of the machine has been made considerably easier and handier.

OVER 150 IN USE, MANY OF THESE REPEAT ORDERS.

Waterous

BRANTFORD. ONTARIO CANADA



Centrifugal Pumps

WATEROUS Centrifugal Pumps are designed with a split hose which allows the working parts to be lifted bodily from the base without disturbing the foundation. This is of special benefit when pump is set in concrete, or where suction flange is place close to a wall and difficult of access. Other special features are, split bronze packing gland, reversible runners and barrel, extra large bearings.

Beating Engines

WATEROUS Beating Engines are essentially up-to-date and without the defects that many old style machines are being built with.

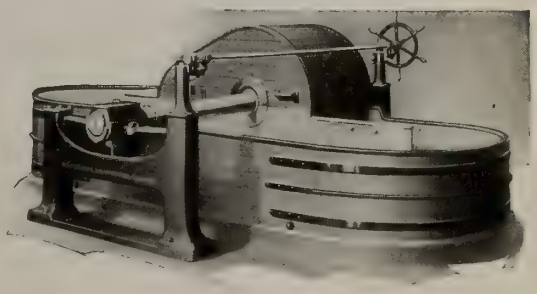
Built in 500, 800, 1000, 1200, 1500 x 2000 pound capacities.

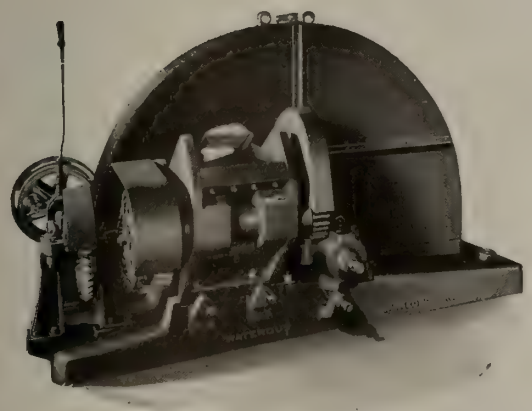
Fitted with cypress, iron or cement tubs as desired.

Washing drums of new design, fast lifting and easy operating.

The Wallace Hydraulic Roll Regulator does away with guess work in roll regulation.

We build it also with sand trap and hydraulic flushing device.





Slab Chippers

THE Waterous Slab Chipper is very similar in design and has the same rugged construction as the famous Waterous Chipper. It will make chips from slabs and edgings, which are fed into a specially designed spout, equipped with power feed works consisting of top and bottom feed rolls. These rolls are driven from the chipper shaft, through a friction clutch pulley, which allows the feed works to be stopped and started at will. The power is taken in the friction through a spur gear and pinion. By driving the feed works from the chipper shaft, the material is automatically fed at the proper speed at all times.

Waterous

BRANTFORD. ONTARIO CANADA



MODERN FAST-RUNNING NEWSPRINT MACHINES

The machines illustrated above are each 166 inches wide and are now running in the mills of the Laurentide Co., Limited, at Grand'Mere, Que., having been designed and built by us in 1920, and installed in the early part of 1921.

The combined production of these machines for one week has been equivalent to 159 tons per 24 hours, and they are running regularly at 950 to 1,030 feet per minute on newsprint.

This speed has been made possible by superior design and construction and the use of the latest and best mechanical devices, particularly our Millspaugh Suction Roll.

Dominion Engineering Works, Limited

Telephone Melrose 700 — MONTREAL, CANADA — Cable Address "Domworks, Montreal"

R. F. MATHER, Western Representative, London Bldg., Vancouver, B.C.

(M-18



WE BUILD ALL TYPES OF PAPER MACHINES

The cut above shows a dry end view of a 148 inch Harper Fourdrinier machine built by us for the Interlake Tissue Mills, Limited, Merritton, Ont. It is designed for a speed range of from 100 to 550 feet per minute and has been running on a variety of papers from 12 to 80 lbs. weight.

It is equipped with our Millspaugh Suction Couch Roll, eighteen 48 inch dryers, 8 roll calender stack, two drum offset reel and a double drum winder.

Estimates for new machines or on re-construction of existing units will be promptly submitted for your consideration, after receipt of particulars or a visit to your mill.

Dominion Engineering Works, Limited

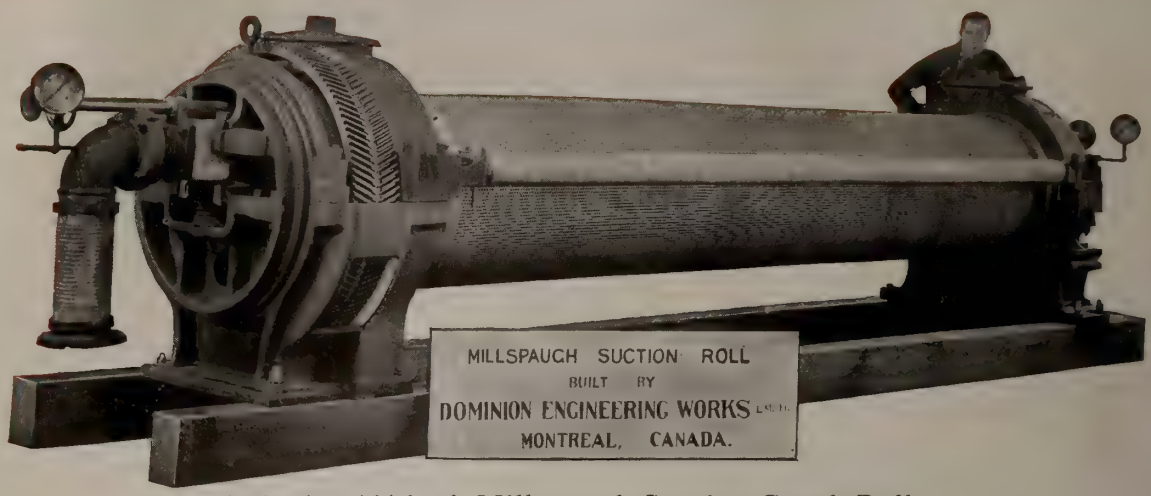
Telephone Melrose 700

MONTREAL, CANADA

Cable Address "Domworks, Montreal"

R. F. MATHER, Western Representative, London Bldg., Vancouver, B.C.

(M-19)



30 inch x 166 inch Millspaugh Suction Couch Roll, Assembled in the Shop.

Millspaugh Suction Rolls

Make Possible the Fast Running Paper Machine— Increase Your Production—Improve Your Quality

In ordering a new machine, no mill can afford to omit Millspaugh Suction Rolls. This equipment can readily be applied also to nearly all existing paper machines by comparatively small changes and at moderate expense for re-arrangement.

In addition to our work as builders of complete paper machines, we re-design and re-build all types of existing paper machines, on modern lines, for more and better production.

We are always glad to confer with those interested in equipment for meeting present day conditions in the paper trade, and an interview with our engineering and sales representatives will not obligate you in any way.

Some of our specialties are as follows:

Millspaugh Shower Pipes,
Plunger and Fan Type Stock Pumps,
Pope Paper Reels,
Granite Press Rolls,
Rubber Covered Rolls.

Our shop equipment includes Roll and Dryer Grinding Machinery capable of handling the largest work of this kind now produced. Rolls sent us for re-grinding are finished and returned very promptly.

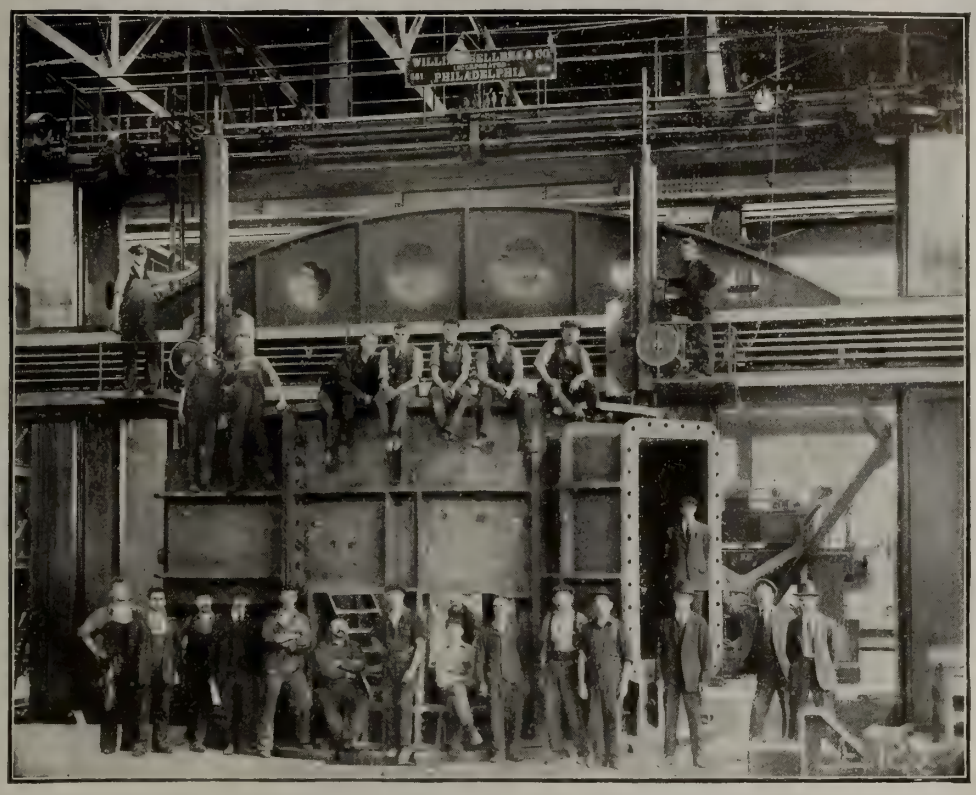
We also have facilities for the heaviest and most difficult Foundry and Machine Shop Work, and can handle such products in any weight up to 75 tons per piece, in Grey Iron or Semi-steel.

Dominion Engineering Works, Limited

Telephone Melrose 700 — **Montreal, Canada.** — **Cable Address : "Domworks Montreal"**

R. F. MATHER, Western Representative, Vancouver, B.C.

(M-20)



Foundation Ring for 20,000 H.P. Laurentide Turbine Unit on 35 foot Boring Mill at Dominion Engineering Works Plant.

Some Typical I. P. Morris Hydraulic Turbines We Have Built or Have Under Construction

CAPACITY			DESTINATION
1 — 1500 H. P.	Turbine	Unit	Cedars Rapids, Que.
2 — 2600 H. P.	do.	do.	Sault Ste. Marie, Ont.
4 — 2900 H. P.	do.	do.	Kapuskasing, Ont.
1 — 3550 H. P.	do.	do.	Copper Cliff, Ont.
2 — 11300 H. P.	do.	do.	Cedars Rapids, Que.
2 — 20000 H. P.	do.	do.	Grand'Mere, Que.
1 — 41000 H. P.	do.	do.	Shawinigan, Que.

Factors which Decided the Selection of These Turbines
High Efficiency—Superior Construction—Absolute Dependability.

We are the Sole Licensees for the Manufacture and Sale of I. P. Morris Hydraulic Turbines in the British Empire, under special arrangement with the Wm. Cramp & Sons Ship and Engine Building Co., I. P. Morris Department, Philadelphia, Pa.

Hydraulic Engineers and Water Power Owners who may be interested in the development of water power in any part of the British Dominions are invited to write us for information regarding these turbines and their remarkable efficiency and reliability.

Dominion Engineering Works, Limited

Telephone: Melrose 700

Montreal, Canada.

Cable Address: "Domworks Montreal"

R. F. MATHER, Western Representative, Vancouver, B.C.

THE HARLAND ENGINEERING

MONTREAL,

MANUFACTURERS OF

SECTIONALIZED ELECTRIC DRIVES

for

Newsprint, Tissue, Book, Bond, Kraft and
Blotting Paper Machines

Higher operating speeds.

Increased production.

Improved quality.

Less broke.

Reduced power cost.

Elimination of belt cost.

General maintenance reduced.

Less space and no basement required.

Reduced life and fire hazards.

Increased reliability.

Increased cleanliness.

Control greatly simplified.

Head Office:

102 St. Antoine Street
Montreal

CO. OF CANADA LIMITED

CANADA

THE

HARLAND PATENT INTERLOCK DRIVE

Is the most simple and effective.

It is entirely automatic and requires no personal attention on the part of the machine operators for the alteration of field regulators, resistances, etc.

It is the only drive employing one motor only per section of the paper machine.

No belts are used to transmit any or part of the power, therefore belt slip is entirely eliminated.

Control is maintained by a simple differential regulator.

No complicated electrical contacts are required; therefore greater reliability is obtained.

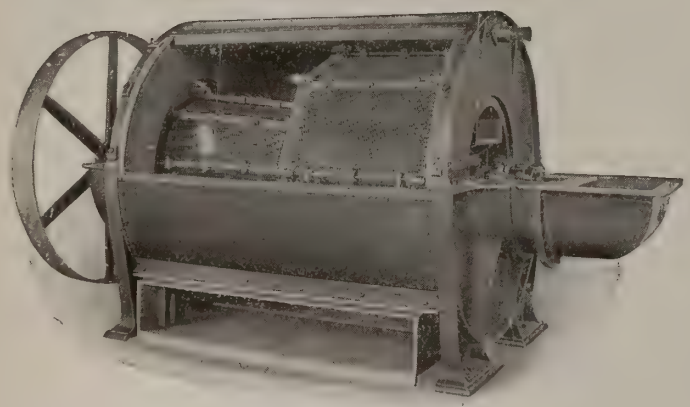
Has proven its superiority over all other forms of drive, being the only drive at present operating newsprint machines at over one thousand feet per minute.



Insure your Output

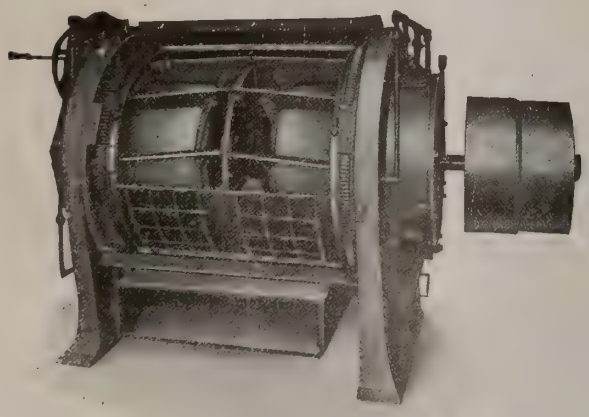
By Installing Modern Machinery

Knotters, Knot Screens or Sliver Screens



For sulphite, sulphate, soda, kraft or ground wood. Capacity up to 50 tons, less than 1 H.P. per machine, single belt drive, no gears or sprockets, no packings, slow speed, quick detachable plates. The standard machine for removing knots, shives and foreign matter.

Centrifugal Screens



For screening sulphite, sulphate, soda, kraft or ground wood. Highest quality of stock produced at minimum power, revolving screen plates, mechanically correct.

Our other Machines have proved their own value

Your Investigation Warranted

SHERBROOKE MACHINERY CO. Limited,

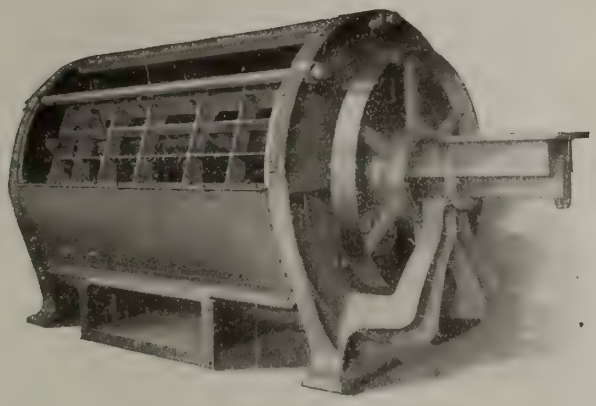
SHERBROOKE - QUEBEC

"IMPCO"
TAILING SCREENER

FOR SCREENING GROUND WOOD TAILINGS

Very Low Power and Upkeep Expense
Delivers Rejections Free of Good Stock

WRITE FOR DETAILS



"IMPCO" TAILING SCREENER

CORRESPONDENCE A PLEASURE

CLOSED SYSTEM FOR GROUND WOOD PULP

"IMPCO" KNOTTER
"IMPCO" SCREEN
"IMPCO" TAILING SCREENER
"IMPCO" REFINER

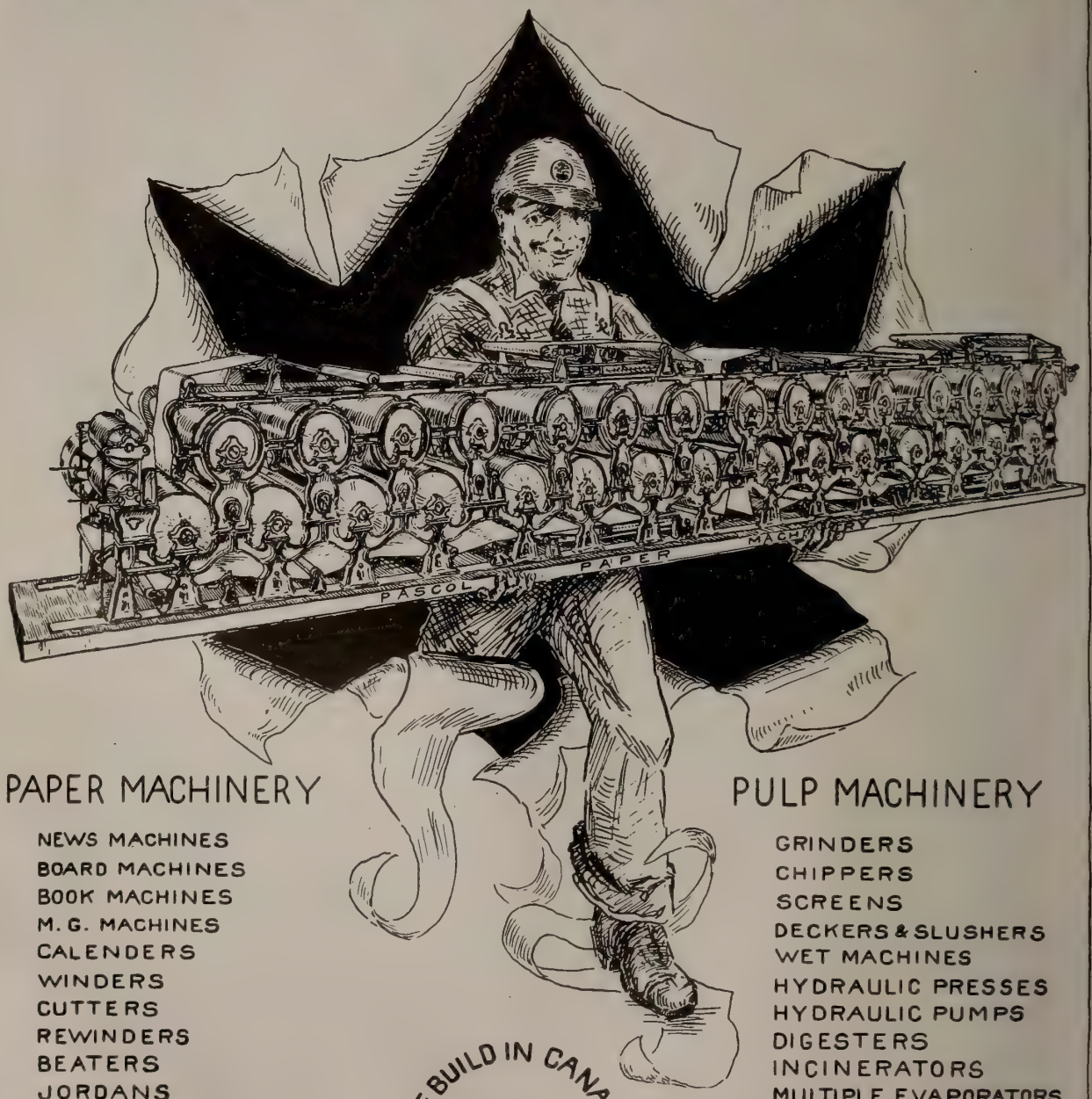
No Pulp Lost Except Rejections at Bull Screen

SHERBROOKE MACHINERY Co., Ltd.
SHERBROOKE

PORT ARTHUR SHIPBUILDING CO. LTD.

"PASCOL"

PULP & PAPER MACHINERY



PAPER MACHINERY

NEWS MACHINES
BOARD MACHINES
BOOK MACHINES
M. G. MACHINES
CALENDERS
WINDERS
CUTTERS
REWINDERS
BEATERS
JORDANS
STUFF PUMPS

WE BUILD IN CANADA

PULP MACHINERY

GRINDERS
CHIPPERS
SCREENS
DECKERS & SLUSHERS
WET MACHINES
HYDRAULIC PRESSES
HYDRAULIC PUMPS
DIGESTERS
INCINERATORS
MULTIPLE EVAPORATORS
FAN PUMPS

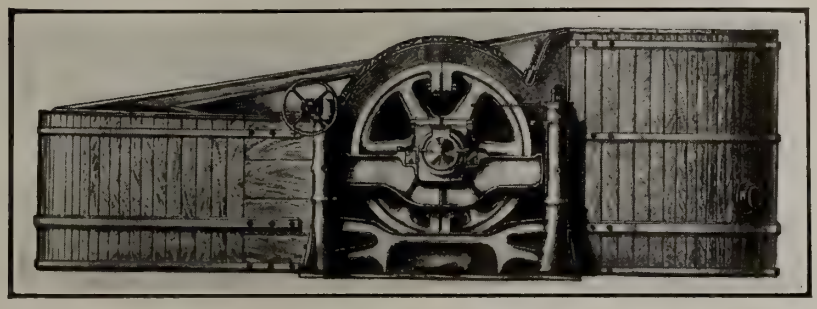
THE NIAGARA BEATER, THE ZAREMBA EVAPORATOR,
THE SOUTHWARK FOUNDRY & MACHINE COMPANY'S PRESSES,
ACCUMULATORS & PUMPS.

PORT ARTHUR, ONTARIO, CANADA.

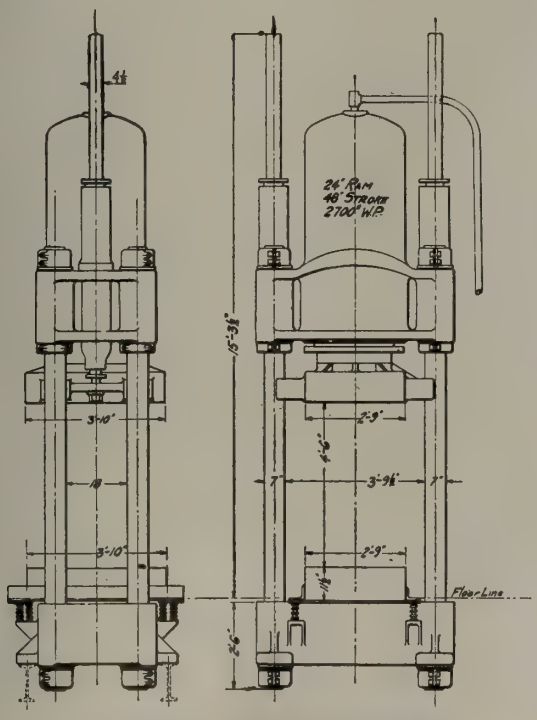
PORT ARTHUR SHIPBUILDING CO., LIMITED

PORT ARTHUR, ONTARIO, CANADA

WE BUILD IN CANADA



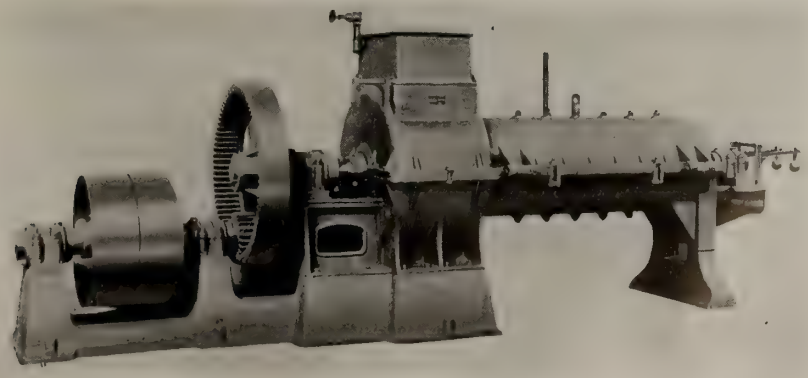
NIAGARA BEATERS



HYDRAULIC PULP PRESSES



ZAREMBA EVAPORATORS



LANNOYE PULPERS

We build in Canada the RICE-BARTON patent high speed fourdrinier as used on the LAURENTIDE machines.

Downingtown Manufacturing Company

Over forty years experience is back of the machinery we build.

Cylinder Paper Machines
Fourdrinier Paper Machines
Beaters, Pumps etc.

East Downingtown Pennsylvania, U.S.A.

WRITE US FOR CATALOG.

Established 1886

Reputation

" Who steals my purse steals trash,
But he that filches from me my good name
Robs me and makes me poor indeed."

THE immortal bard, through one of his characters gave expression to the true meaning and estimate of a man's reputation. It is the one thing to be cherished and to be jealous of.

SUCCESS is not always measured in dollars. Of course, oftentimes, financial success goes hand in hand with good repute. What has given us infinitely more satisfaction than mere financial growth is the structure of good will which we have built up, the cornerstones of which are Integrity, Reputation, Service and Experience.

M. GOTTESMAN & COMPANY

INCORPORATED

BRANCHES AT
Holyoke, Mass.
Kalamazoo, Mich.

18 East 42st Street
New York, N. Y.

"The Straight Road to Efficiency"

AMBITION

Man was made for growth. It is the object of his being. To have an ambition to grow larger and broader every day — to push the horizon of ignorance a little further away, to become a little richer in knowledge and a little wiser, and more of a man. That is the ambition of our organization.

QUALITY

The measure of a thing is not simply its concrete elements. Quality, for instance, has a character not to be estimated alone by size, shape or substance. To any three dimensions of quality, one must often add a fourth — the satisfaction in its possession. This fourth thought is constantly in mind when we select dyes and colors to bear our name.

SERVICE

Service is giving the customer what he wants — when he wants it. The reputation of our dyes and colors for high quality and general efficiency is universally known. It is the result of years of faithful service and genuine values. Today this reputation entails responsibility, — while others might be tempted to produce dyes of a lower grade, we have a reputation to live up to, which will be maintained at all costs.

L. B. HOLLIDAY & CO., LIMITED

HUDDERSFIELD, ENGLAND

CANADIAN OFFICE AND WAREROOMS:

27 ST. SACRAMENT STREET - MONTREAL, P.Q.

L. B. Holliday & Co. Limited

WE ARE AT PRESENT MANUFACTURING THE FOLLOWING of interest to the Pulp and Paper Industry.

BASIC COLOURS

Auramine O. conc.
Acridine Yellow R.
New Phosphine R.
Chrysoidine Y. conc.
Basic Green B. conc.
Methyl Violet 2B ex.
Methyl Violet 4R ex.
Magenta Powder.
Bismarck Brown R. conc.
Safranine B.S.
Safranine R.F.F.
Methylene Violet 2R. conc.
Methylene Violet 2B. conc.
Malachite Green Crystals.
Methylene Blue B.B. conc.
Methylene Blue 1814.

NEWS BLUE

SUBSTANTIVE COLOURS

Paramine Fast Pink B.
Paramine Sky Blue F.F.
Paramine Blue 2B.
Paramine Black B.H.
Paramine Yellow R.
Paramine Brown G. conc.
Paramine Brown M.
Paramine Fast Bordeaux B.
Paramine Green G.
Paramine Violet N.
Paraphenine Yellow G.
Diazamine Fast Yellow H.
Rosophenine 10B.
Benzopurpurine 4B.

Paper Black 3181

ACID COLOURS

Orange II.
Orange IV.
Naphthol Blue Black 10B.
Acid Prune V.
Brilliant Bordeaux B.
Ponceau G. conc.
Ponceau 4R conc.
Croceine Scarlet 5R.
Carmoisine S.
Nigrosine W.S.

Product Samples, Patterns, and all particulars from

L. B. HOLLIDAY & CO., LIMITED

HUDDERSFIELD, ENGLAND

Canadian Office and Warehouse

27 ST. SACRAMENT ST. - MONTREAL

Orders supplied direct from Canadian Stocks. New Products will be added from time to time.

Pulp-Stone You Can Depend Upon —Absolutely

WHEN you order Ipsco Pulp-Stone, you can be sure of getting what you wish when you wish it. You can depend upon the quality, for that's assured. Every Ipsco Pulp-Stone is absolutely guaranteed to be free from flaws, seams or natural cracks, outside or concealed.

Trade **IPSCO** Mark

PULP-STONE

You can depend upon uniformity. **Ipsco is carefully graded** into three classes of grit — fine, medium and coarse. Establish the grit you wish, and we will ship you the same grit every time. Or you can send your own representative for personal selection at the quarries.

And you can depend upon promptness. Ipsco Pulp-Stones are made at Empire and East Liverpool, Ohio — where marketable pulp-stones have been produced for years. You can be sure of shipments as promised.

A Free Sample will be Sent You on Request

Write today, stating whether you wish fine, medium or coarse grit. The sample will be mailed promptly. You can then place your order with absolute assurance that quality will be maintained.

The International Pulp-Stone Co.

General Office: Elyria, Ohio

Quarries: Empire, Ohio
East Liverpool, O.



Modern Pulp Mill Machinery

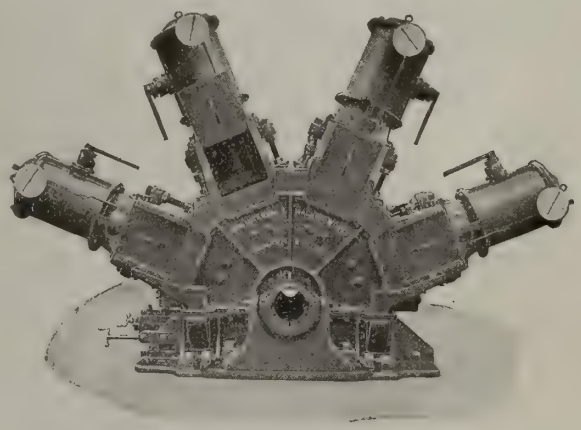
Built to suit your needs. New designs and improvements in our machines help you to bigger output and bigger profits. High quality materials and workmanship guarantee satisfaction.

WET MACHINES:
A rugged machine supplied with interchangeable felt rolls, complete with suction box, shower pipe, cut off knife steel, pine or cypress vats and any type of drive to suit installation. All sizes, single or double cylinders. Also combination wet machine and decker.

CHIPPERS:
Improved disc — no slivers No saw dust. Knives shear instead of chopping wood, giving smooth running and greater production on same power. Heavier disc and bed guarantee long service. 90", 84" and 48" sizes. Reversible bed knife.

"TIDMARSH" IMPROVED PULP GRINDERS.
"Tidmarsh" patent pulp scrapers prevent "flour" pulp. "Tidmarsh" patent automatic door openers open the doors instantly when the wood is ground away. Refilling is quicker and easier, which means steadier production. Pockets tapered both ways to prevent wood wedging. Large discharge opening. Large hand hole plates. Packing gland adjustable from oustide of machine while in operation.

We also build flat screens, deckers, digestors, diffusers, tanks, boilers for power or heating purposes and steel plate work of all kinds. We are also equipped to do welding by the oxy-acetyline or electric processes.



4-Pocket Grinder, Built also in 3-Pocket Style.

Let us remodel your 3-pocket grinders into modern efficient, 4-pocket "Tidmarsh" improvement grinders that will deliver 30 per cent more output.

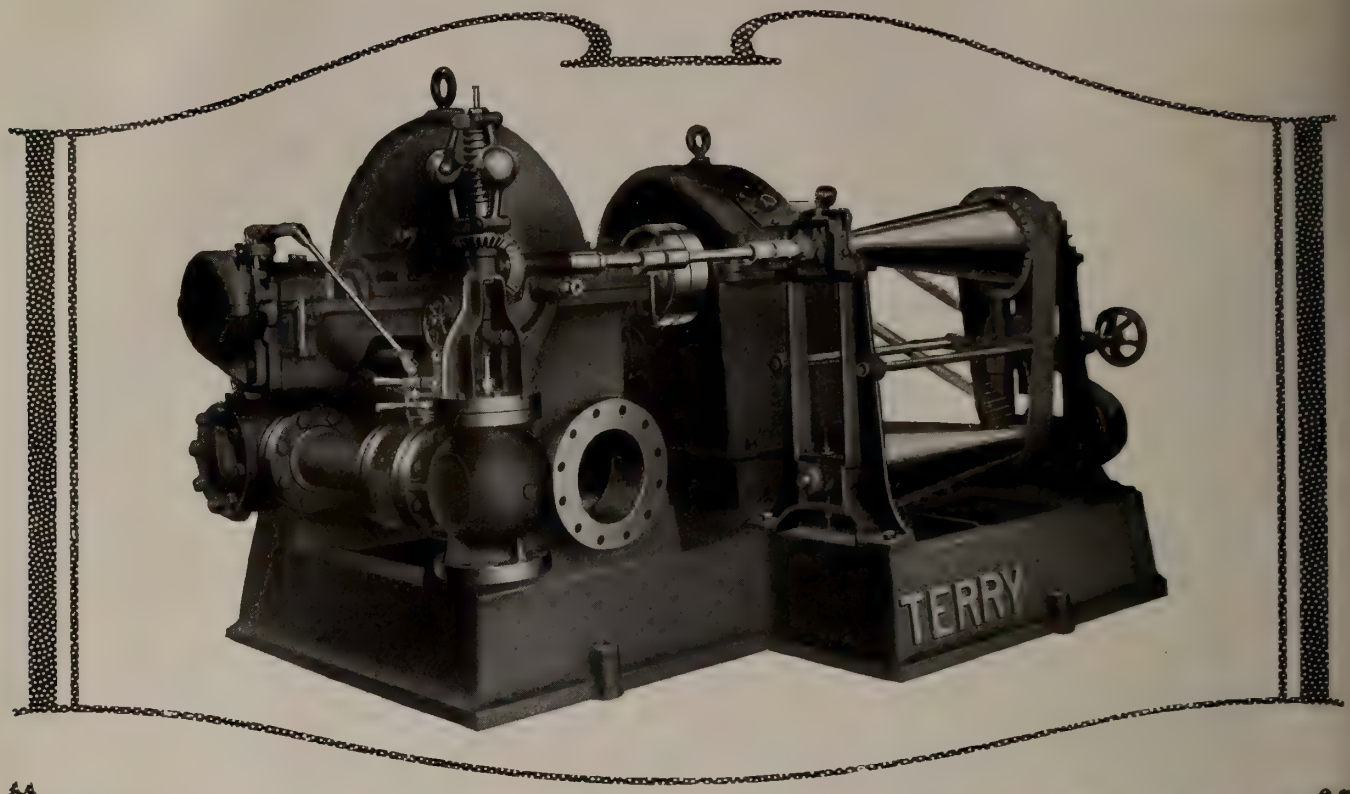
Let us send you our latest money saving quotations.

Engineering & Machine Works of Canada, Limited

St. Catharines, Ontario.

EASTERN SALES OFFICES:
Hall Machinery Co., Sherbrooke and Birks Building, Montreal





"Variation in Speeds *from* 6 to 1"

THE steam turbine has been recognized as an ideal drive for paper machines which turn out only one grade and weight of paper, because of its uniform and constant rotary speed (with variations of less than 1%) its dependability with attendant freedom from upkeep cost and repairs and, most important of all, because of its clean exhaust.

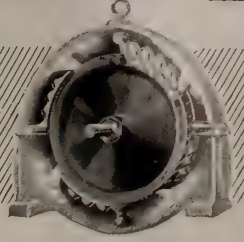
The drying rolls are, therefore, kept free from oil and operating at their utmost efficiency.

The advent of the new Terry unit with its variable speed governor now makes the turbine applicable to paper machines producing various grades and weights of stock. A constant speed of 300 R.P.M. or 1800 R.P.M., or any intervening speed, may be held with but slight variation.

Write for Bulletin 25C on the Terry turbine and gears and special references on the variable speed drive.

T-754

THE TERRY TURBINE



Offices in Principal Cities in U.S.A. also in Important Industrial Foreign Countries

The Terry Steam Turbine Co.
Terry Sq. Hartford, Conn. U.S.A.

William Hamilton Company, Limited

PETERBOROUGH, ONTARIO

Manufacturers of UP-TO-DATE

Pulp & Paper Mill Machinery

We are now prepared to furnish the following equipment for Pulp and Paper Mills:

LOG HAUL UPS
PULPWOOD SLASHERS
PULPWOOD CONVEYORS
PULPWOOD STACKERS
BARKING DRUMS
CHIPPERS
CHIP SCREENS
CHIP CRUSHERS
WOOD SPLITTERS
BARK PRESSES
STEAM DRYER ROLLS
JORDAN ENGINES
BEATING ENGINES
CENTRIFUGAL PULP SCREENS (Horizontal and Vertical)
STUFF PUMPS (Single, Duplex and Triplex)
AGITATOR DRIVES
TRANSMISSION MACHINERY
STEEL TANKS
STEEL PLATE WORK
REFUSE BURNERS

— *ALSO* —

HYDRAULIC POWER PLANT EQUIPMENT

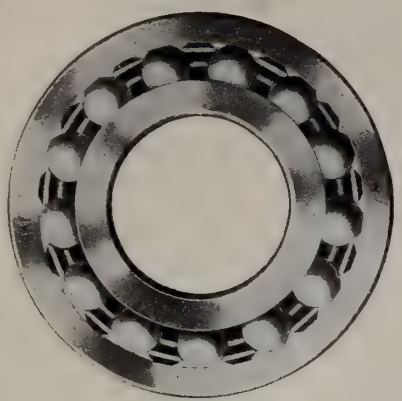
Send us your enquiries. We will gladly quote you prices with specifications

William Hamilton Company, Limited

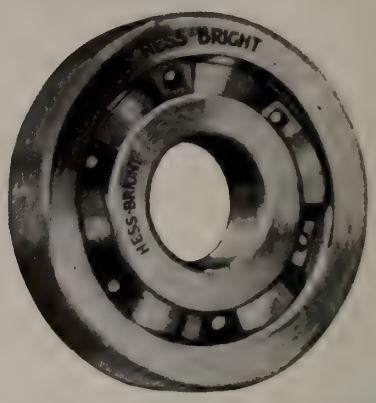
PETERBOROUGH, ONTARIO

CANADIAN SKF CO., LIMITED

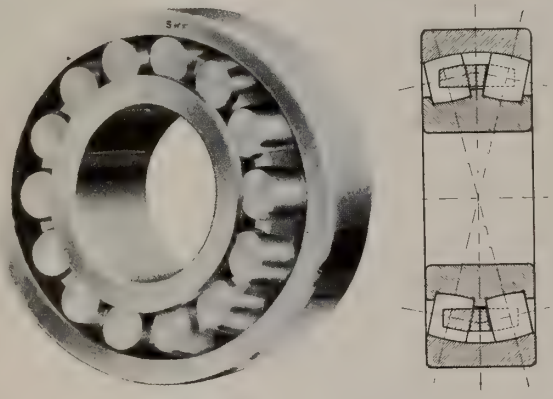
Toronto & Montreal.



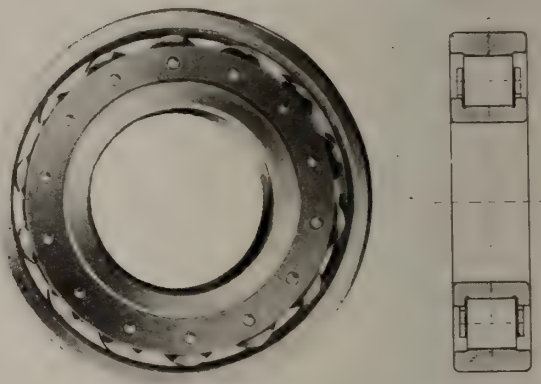
SELF ALIGNING BALL BEARING



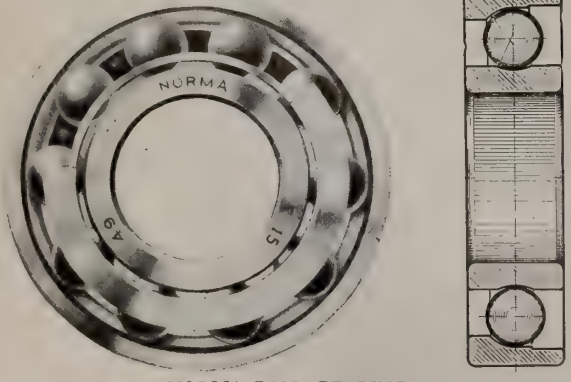
RIGID SINGLE ROW DEEP GROVE BEARING



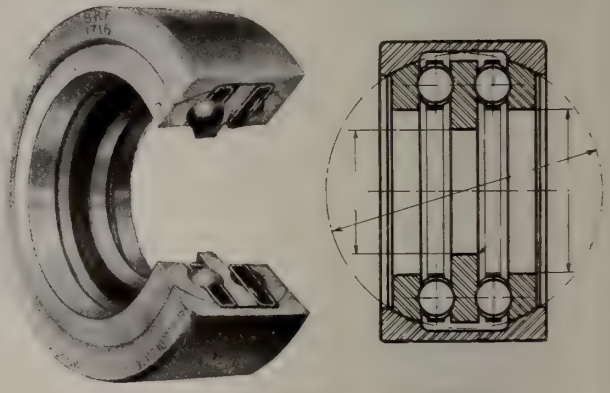
SELF-ALIGNING ROLLER BEARING



CYLINDRICAL ROLLER BEARING



NORMA BALL BEARING



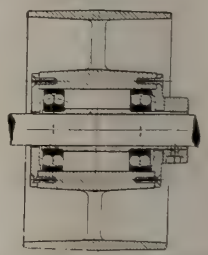
SELF-ALIGNING THRUST BEARING



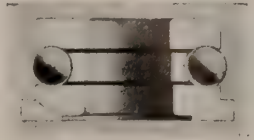
BALL BEARING DROP HANGER



BALL BEARING PILLOW BLOCK

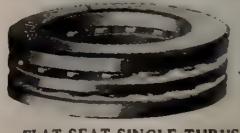


BALL BEARING LOOSE PULLEY



SPHERICAL SEATED THRUST BEARING

SKF PRODUCTS



FLAT SEAT SINGLE THRUST

"ALBANY"

FELTS and JACKETS for Paper and Pulp Mills

ALBANY FELTS are adapted for every type of Paper and Pulp Machine, and for every kind of stock. Every one is made of Pure Wool of the very best quality.

¶ Twenty-five years' experience in making Paper Makers Felts and Jackets has shown us how to make them as best suited to the needs of various kinds of machines and stock.

¶ Every possible offort is made to give our customers the best satisfaction and to weave into our Felts and Jackets the longest possible life.

ALBANY, **ALBANY FELT COMPANY** NEW YORK

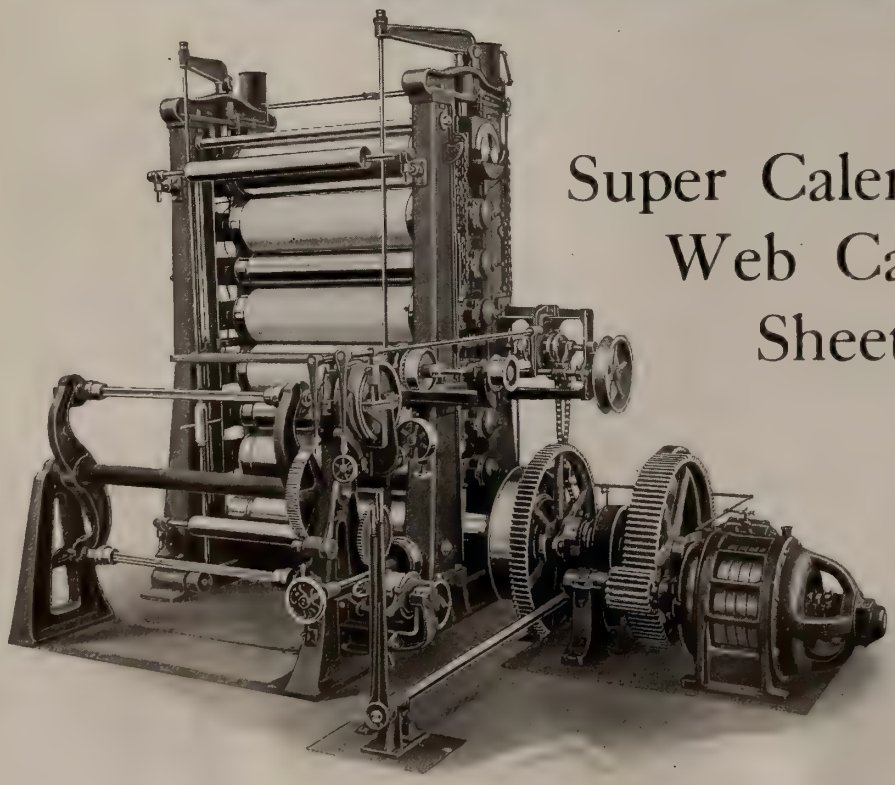


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One of our recent installations in a large Eastern Mill, 8,000,000, gallon capacity





Super Calenders
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Sheet Calenders
Platers.

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LACHUTE MILLS P.Q.

Pioneers and leading the field, in Canada, In the manufacture of

PULP and PAPER MAKERS' FELTS

Largest Plant of the kind in the Dominion, ranking amongst the most modern FELT FACTORIES in the World.

Capacity easily taking care of very important Canadian customers' requirements — and shipments to the other Paper Making Countries.

The success and reputation of "Ayers Felts" bears evidence of the Quality and Dependability built into them. Construction features evolved for all kinds of machines, for all classes of paper, to give maximum efficiency with regard to the particular manufacturing problems in the various mills.

The Attainment of an Ideal

"FELTS
WASHED
WITHOUT
SHUTTING DOWN
PAPER MACHINES"

The Patented "Ayers" FELT WASHER attains this ideal for which paper makers have long been striving. By the means of this device, the work of cleaning and washing the Felts is done without stoppage of the machinery and, in the case of news print or similar paper, without breaking or crushing the sheet.

PATENTED IN U.S.A., CANADA AND EUROPEAN COUNTRIES.
PATENTS APPLIED FOR IN JAPAN AND MEXICO.

Already in operation in some of the largest Paper Mills where it is recognized as indispensable and a great money saver.

Privilege to install this FELT WASHER readily granted by AYERS LIMITED to all its customers on most reasonable terms.

Full particulars given upon application.

A special Felt has been designed for use in conjunction with this Felt Washer wherever it is in operation.

These two essential factors — "AYERS FELTS and FELT WASHER" — in perfect team work — make for efficiency, economy and genuine satisfaction in the Paper Mill.

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PIONEERS

The Union Sulphur Company are the pioneers of the sulphur industry of America and today, after nearly 20 years of constantly increasing business, are still the leaders.

PURITY

The sulphur produced by this company runs well over the 99½% purity guaranteed. Tests show that Union sulphur has maintained a purity that is unsurpassed and when you contract for Union sulphur, you are sure of obtaining more than their guarantee.

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The better to serve the paper manufacturers, a fleet of vessels used solely to transport sulphur to numerous ports for distribution is owned and operated by this company bringing to you the highest grade brimstone at the lowest possible cost.

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Ample reserve stocks are always carried so that no matter how large your order it can be shipped without delay. Warehouses in convenient centres are provided with generous supplies to take care of emergencies.

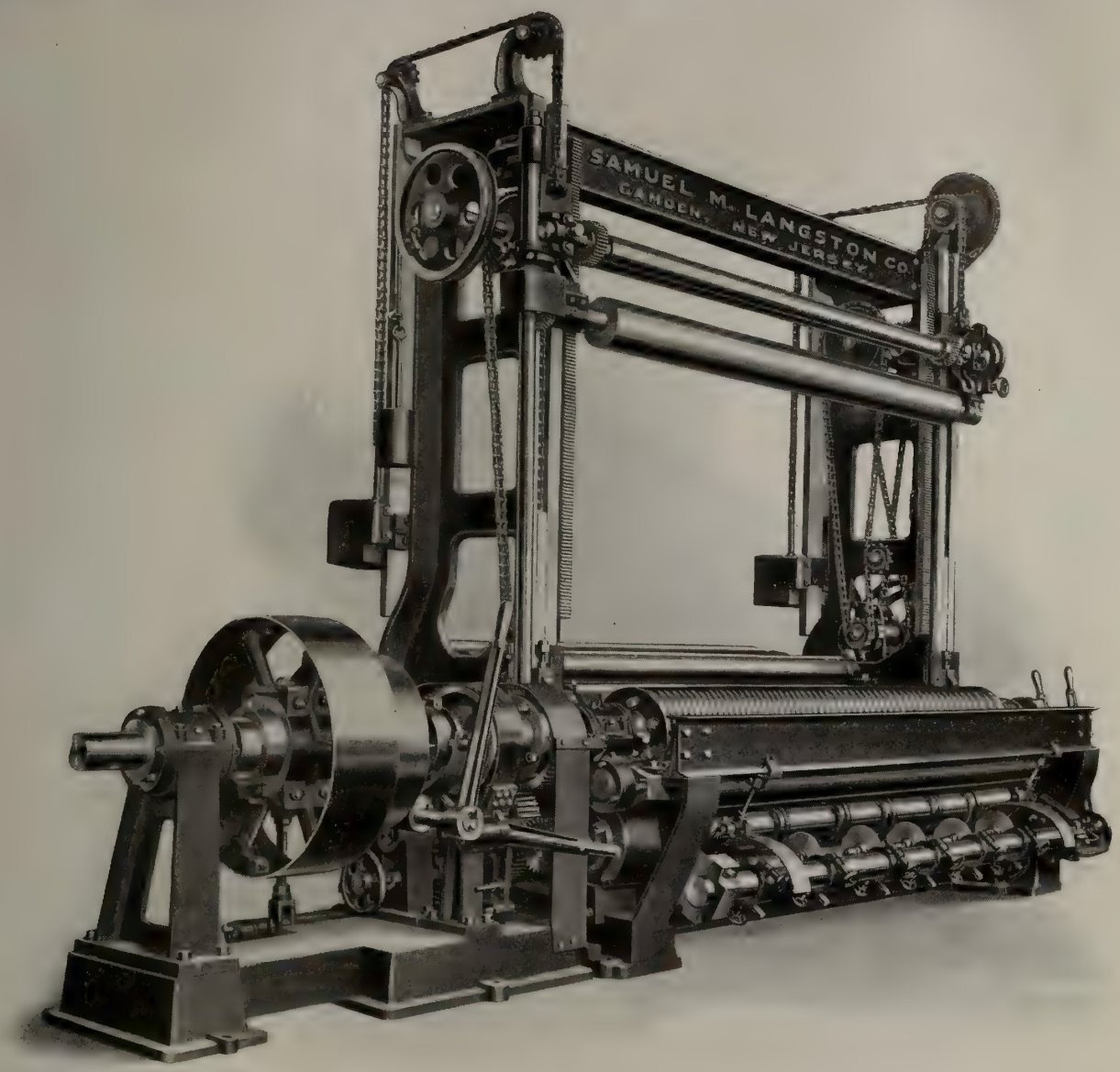
PAPER-PULP

High grade pulp requires two ingredients—carefully selected wood and pure sulphur. Whatever the wood you use, be sure to combine with it the right sulphur—Union Sulphur.

SULPHUR

The Union Sulphur Company

Mines—Calcasien Parish, Louisiana. Main Office—Frasch Building, 33 Rector St., New York.



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or

REWINDERS

"BA"—62" to 92" wide	Rewinder
"CA"—62" to 122" wide	Winder or Rewinder
"DA"—82" and up	Winder or Rewinder

ROLLER AND BALL BEARINGS THROUGHOUT—GEARS—STATIONARY RACK.

"BA"—Standard Langston Shear Cutter for narrow rolls, or Combination Langston and Koegel Shear Cutter

"CA" and "DA"—Only with Langston and Koegel Shear Cutter.

Get full particulars for your file by writing

SAMUEL M. LANGSTON COMPANY, Camden, N. J.

MACLEOD PULP AND PAPER
COMPANY LIMITED

Liverpool, Nova Scotia, Canada

Manufacturers of finest quality
all spruce

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Only groundwood mills located on both railroad and tidewater with open harbor the year round.

Largest Water Power in Nova Scotia, 30,000 horse power.

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HYDRAULIC STRUCTURES STEAM PLANTS

WATER POWER DEVELOPMENT

Dominion Belting Company, Limited

Hamilton, Canada



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"MAPLE LEAF"

Brand

STITCHED COTTON DUCK BELTING—

STRONG DURABLE ECONOMICAL
TRUE RUNNING

Being thoroughly waterproof it is equally good running in wet or dry places, and specially adapted for use in Pulp and Paper Mills. As a main drive belt, "MAPLE LEAF" cannot be excelled, and for conveyors it is in great demand. A trial belt will convince you.



"MAPLE LEAF" BELT DRESSING

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SMITH HYDRAULIC TURBINES



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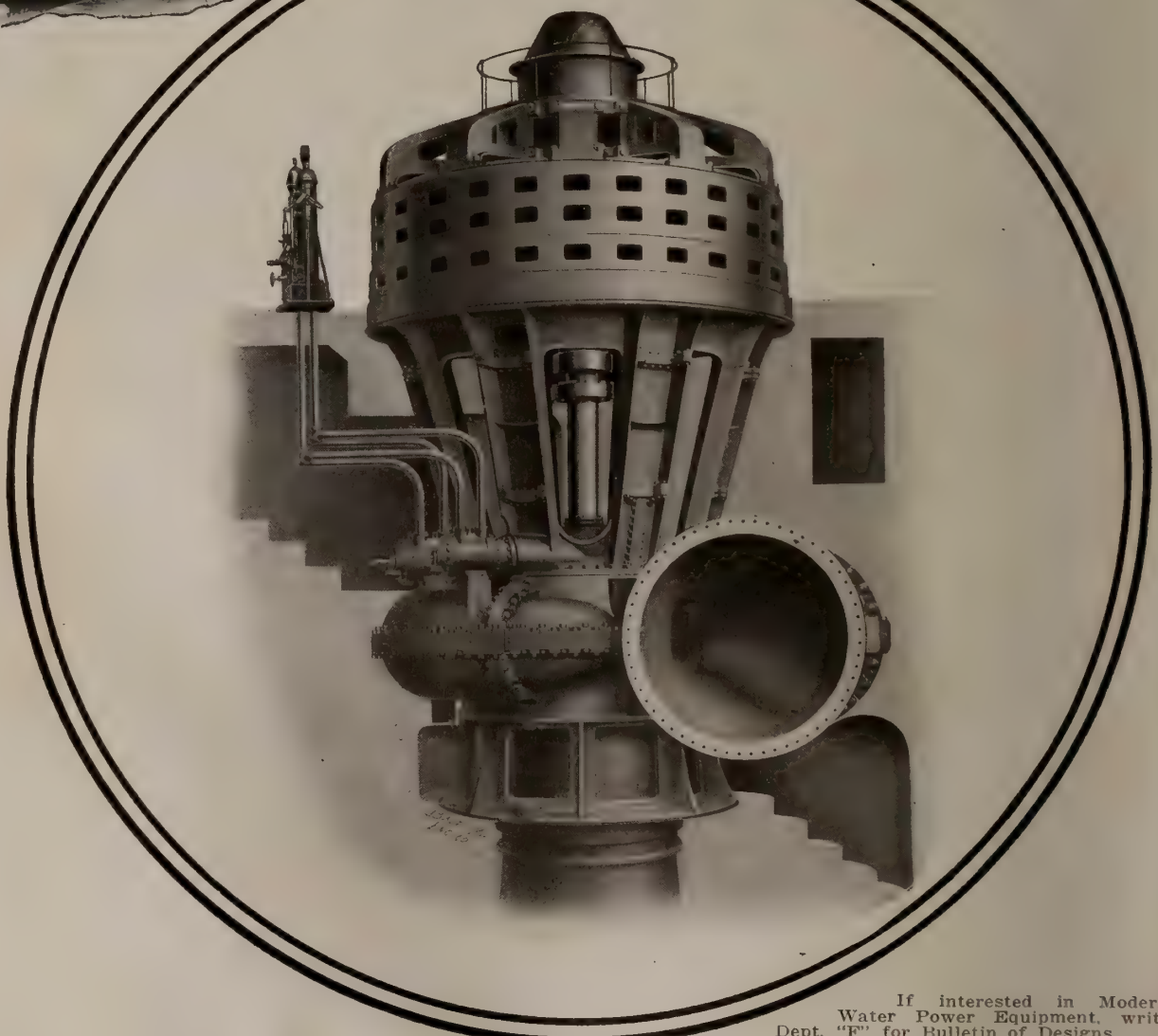
New Brunswick Electric Power Commission—
2 Units— 95 ft. head, 3670 H.P. each, 300 R.P.M.
1 unit —117 ft. head, 3760 H.P., 300 R.P.M.

Nova Scotia Power Commission—
2 Units—156 ft. head, 1960 H.P. each, 514 R.P.M.
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1 Unit — 24 ft. head, 820 H.P.,, 180 R.P.M.

Hydro Electric Power Commission of Ontario—
2 Units—180 ft. head, 20000 H.P. each, 187.5 R.P.M.

Price Brothers, Chutes Des Galets Plant—
2 Units—101 ft. head, 8820 H.P. each, 189.5 R.P.M.

Chicoutimi Pulp Company, Ouiatchouan Falls Plant—
2 Units, 230 ft. head, 1800 H.P. each, 250 R.P.M.
1 Unit—230 ft. head, 1000 H.P., 720 R.P.M



If interested in Modern Water Power Equipment, write Dept. "F" for Bulletin of Designs.

Above illustrates "Volta" Plant of Montana Power Company, Great Falls, Montana, also one of the six vertical shaft SMITH TURBINES installed therein, developing 90,000 H.P. for the operation of the Chicago, Milwaukee & St. Paul Railroad.

S. MORGAN SMITH CO., York, Pa.. U.S.A.

H. B. VAN EVERY, Canadian Representative 405 Power Bldg., MONTREAL



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Daily Capacity 120,000 pounds

KRAFT WRAPPING SHEATHING PAPERS

Daily Capacity 60,000 pounds

Dryden Paper Co., Limited

DRYDEN, ONTARIO, CANADA.

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Adigester assembled in our shops before shipment. This shop assembly insures accurate fitting in the field. It is just one of the refinements of Horton Service.



This chip tank is another example of the completeness of Horton Service. We design, fabricate and erect all kinds of steel plate equipment for the pulp and paper industry, including pulp tanks, smoke stacks, etc.

For the Pulp and Paper Industry

The Horton elevated steel water tanks for pulp and paper mills are recognized as the highest development in water tank building. They give excellent water service, provide positive fire protection in connection with sprinkler systems, and make the plant water supply safe against temporary failure of pumps and water mains.

Ready for distribution: "The Advantages of Steel Water Tanks" and "Sulphite Pulp Digesters." Either bulletin will be sent on request.



This is the famous Horton hemispherical-bottom elevated steel water tank, invented by Horace E. Horton in 1892. The tank in the picture serves the Provincial Paper Mills, Ltd., Port Arthur, Ont.

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Formerly CANADIAN CHICAGO BRIDGE & IRON COMPANY

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132 Janet Street

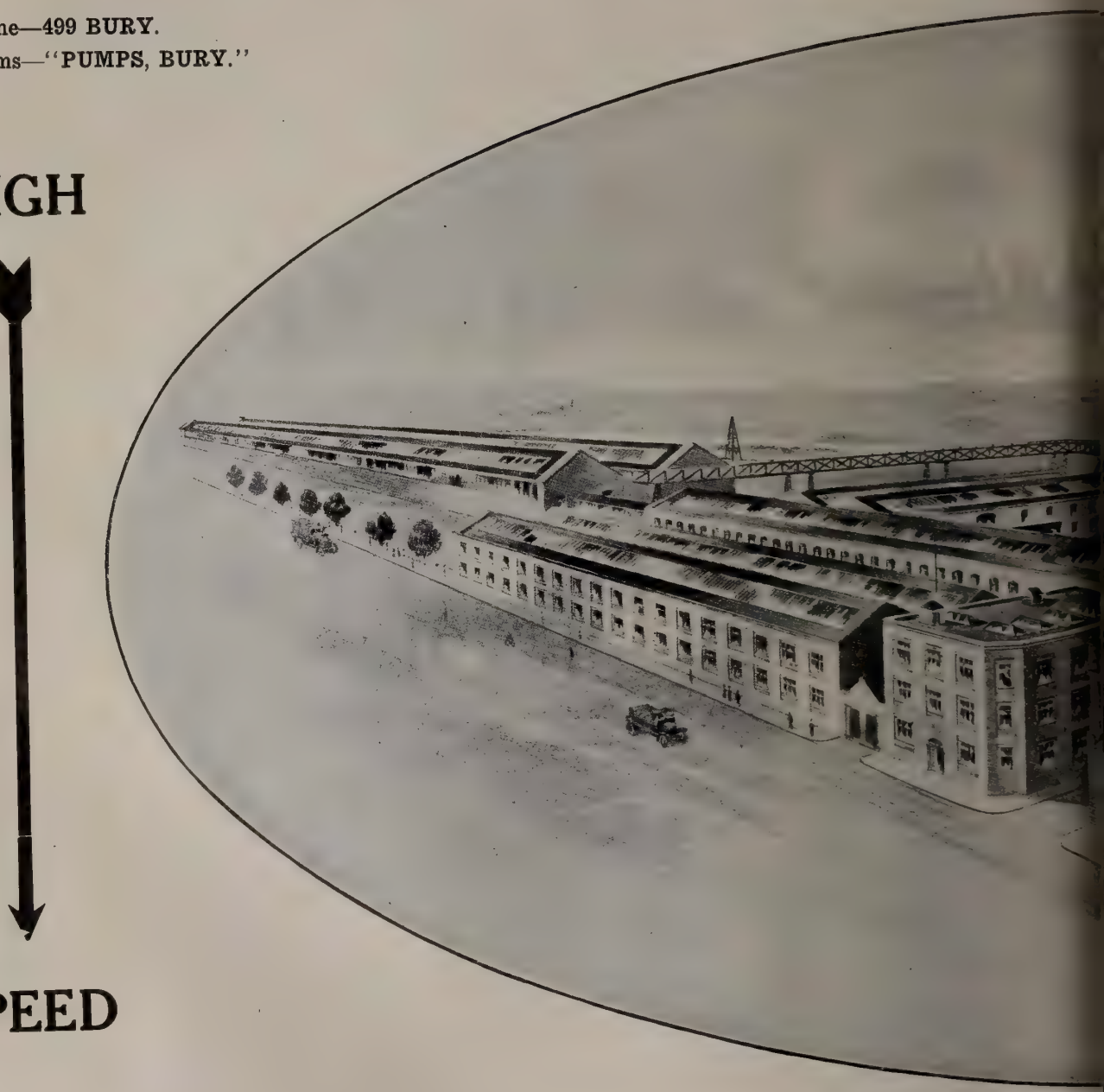
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PAPER

MACHINES

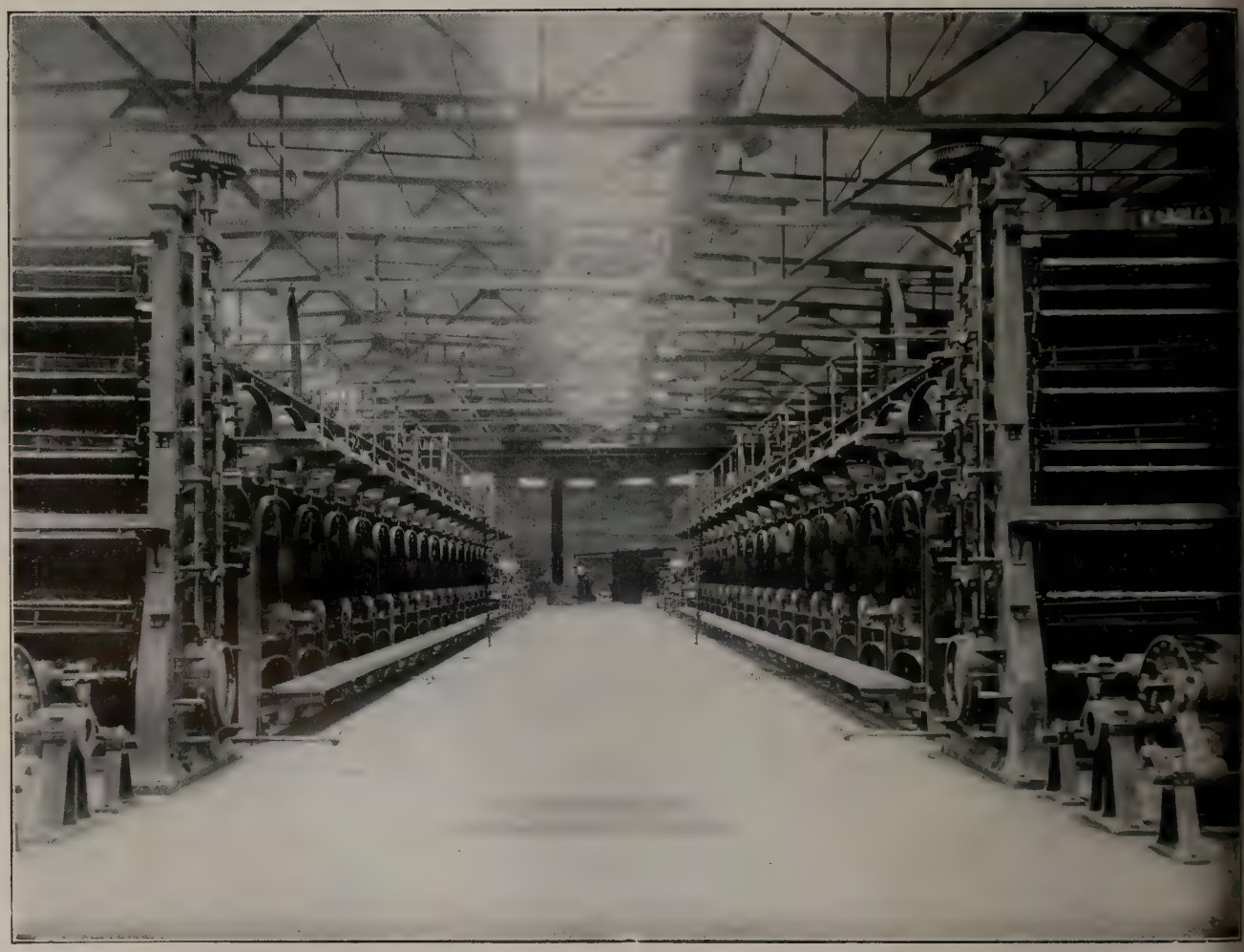
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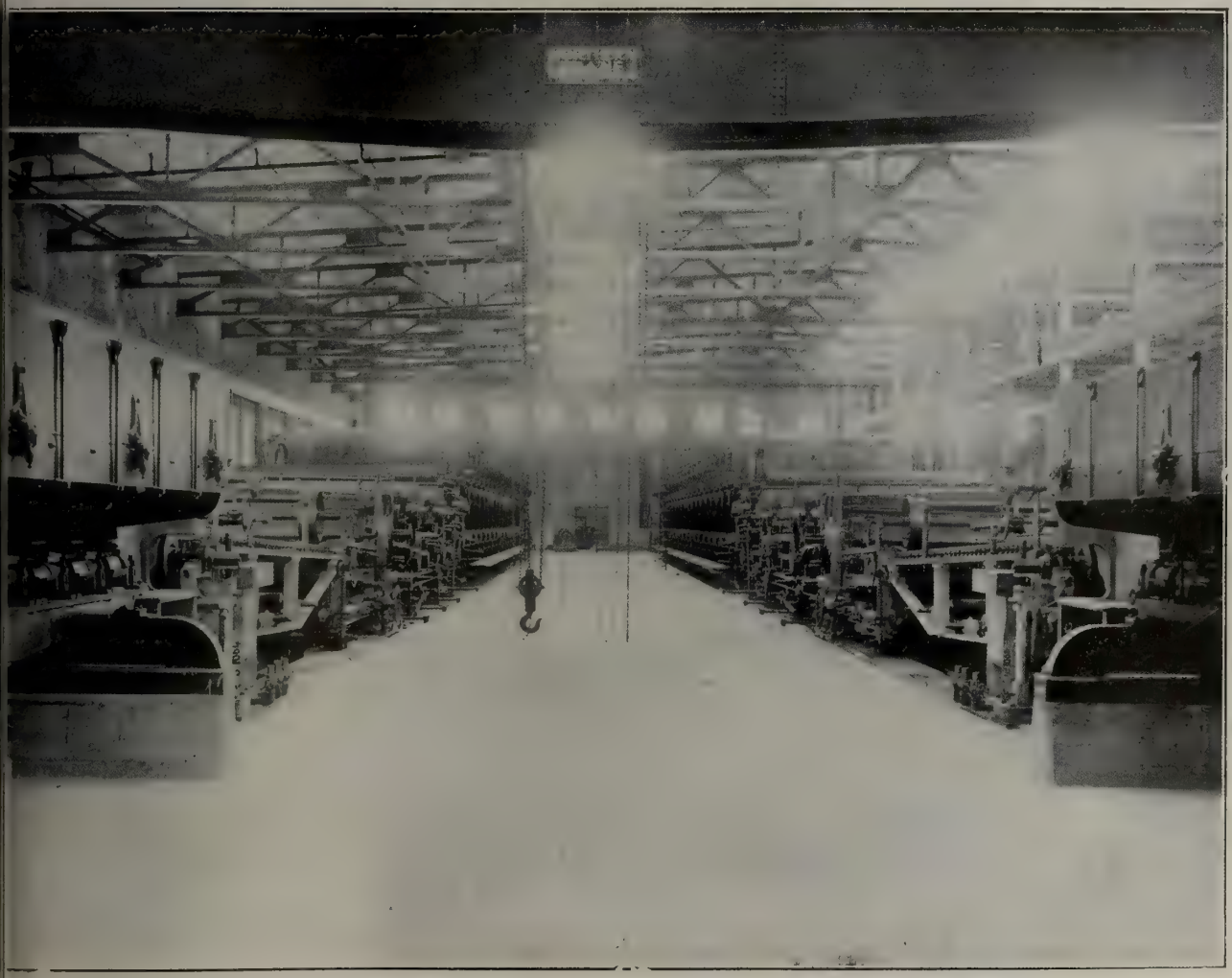
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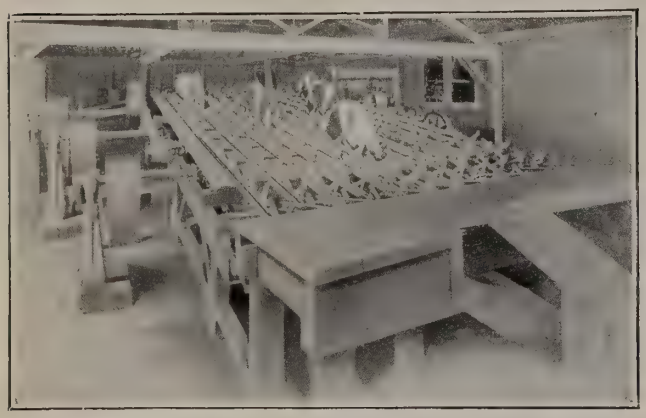


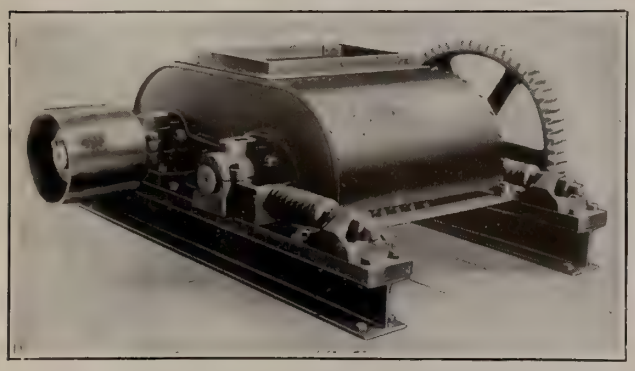
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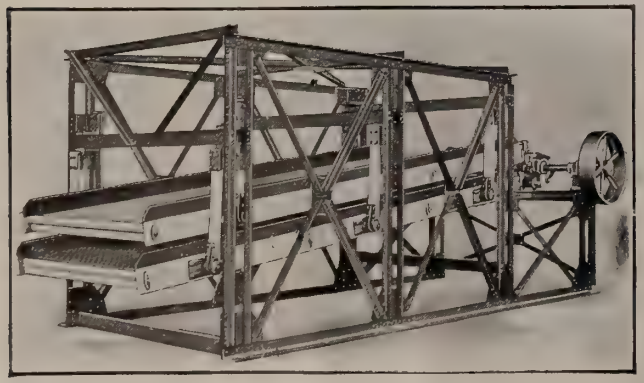
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CANADIAN INGERSO

RYTHER PARALLEL ENDLESS CHAIN LOG HAULS

Ryther Improved Parallel Endless Chain Log Hauls are "a time tried product" possessing an enviable reputation for strength and reliability which has been gained solely on their merits. Sprockets, Chains, Idlers, Take Ups and all other parts are the best that can be made for this service. Bulletin PM-113 describes all parts of Ryther Log Hauls in detail.

RYTHER SINGLE AND MULTIPLE SAW SLASHERS

Ryther Slashers in conjunction with a properly installed Log Haul permit of the handling and cutting up of large quantities of wood with less "lost motion" and at lower cost than any other cross cutting system on the market. Ryther Slashers are the product of many years of specialization in the design of wood preparing machinery and are used in scores of mills in the United States and Canada. Bulletin PM-101 describes all sizes.

CIRCO CHIPPERS AND CHIP CRUSHERS

All parts of the Chippers are bolted to base with fitted bolts. Bearings are very large and have Thrust Devices. Spout is steel lined. Disc is extra heavy giving strong Fly Wheel effect. Knives fit in machined openings and are easily adjusted. The Chip Crushers are massively built, have large capacity and long life and do not pulverize the chips. Photos and specifications of either of these machines on request.

RYTHER PATENT RELIEF DRIVE BALANCED RECIPROCATING CHIP SCREENS

Ryther Balanced Reciprocating Chip Screens with Hickory Hangers and Patent Spring Bar Relief Drive are the greatest improvement in this class of machinery made in years. They present radical contrast to the noisy old fashioned shaking chip screen and are characterized by large capacity, noiseless operation and unusually long life. Made in five sizes with steel or wood frames. Bulletin PM-112 describes them all.

Deckers, Slack Screens, Sliver Screens, Cylinder Moulds, Wet Machines, Slushers, Digestors, Sulphur Burners, Diffusers, Washers, Evaporators, Thickeners, Filters, Hydraulic Pumps and Presses, Pulp Mill Tanks, Stackers, Save Alls, etc.

Canadian Ingersoll-Rand Company, Ltd

Sydney Sherbrooke Montreal Toronto Cobalt Winnipeg Nelson Vancouve

L-RAND PRODUCTS

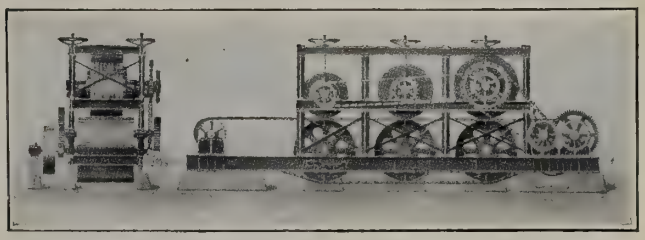
PAULSON PATENT BARKING AND WASHING DRUMS

Paulson Barking and Washing Drums are used in many well known Canadian and American mills and from the standpoint of Simplicity, Strength and Economy are the most successful machines on the market. The machine shown here has been running for seven years without trouble of any kind. For list of sizes and detailed information see Bulletin PM-110-A. If you are not using a Paulson it is still possible to improve the wood barking equipment of your mill.



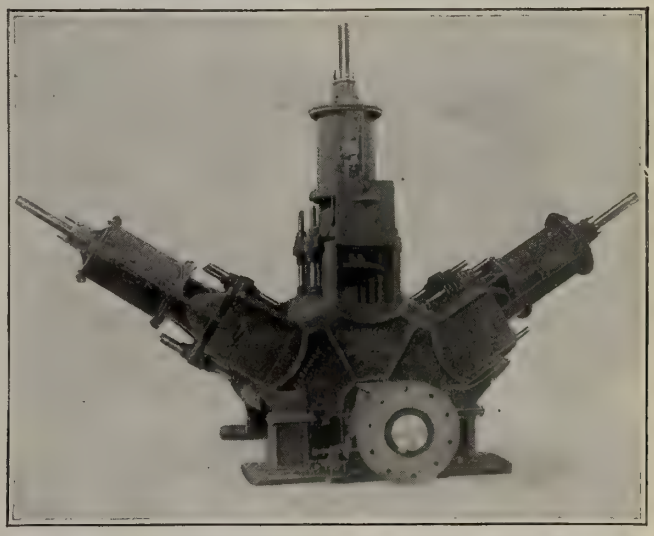
PAULSON PATENT BARK PRESS A MONEY MAKER

The Paulson Bark Press is the simplest and most substantially constructed machine for removing moisture from wet bark that has ever been placed on the market. The water is pressed out by the absolute weight of the laminated discs which automatically allow for any uneveness of the bark. Pressed bark has a high fuel value and is also used for insulating purposes and in cheap boards. Bulletin PM-111.



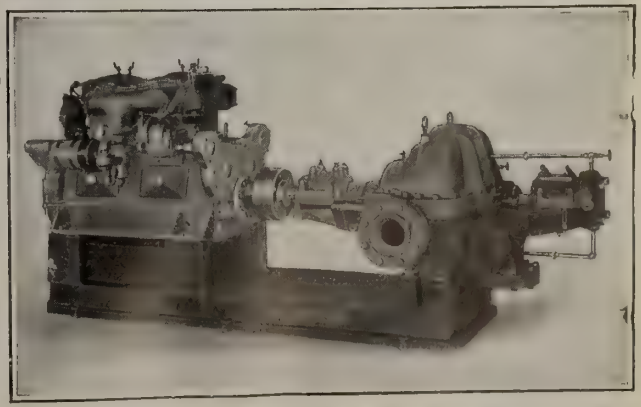
CIRCO IMPROVED THREE POCKET PULP GRINDERS

CIRCO Pulp Grinders are made in both Tail Rod and Mushroom types and with or without Silver Pockets. They are thoroughly well built and dependable machines in every respect giving a large output for power expended and require a minimum of attention. The machine illustrated here is Extra Heavy and will stand up under the hardest class of service. Photos and specifications on request.



CAMERON STEAM AND CENTRIFUGAL PUMPS

"They Run Like A Watch" is an expression that's often, and aptly, applied to Cameron Pumps. The Cameron is the product of nearly seventy-five years' experience in this line of manufacture and many old Cameron Simplex Pumps installed forty and fifty years ago are still in use. Cameron Centrifugals are made for all classes of service and for various types of Drive. Write for a complete set of bulletins covering these famous Canadian made pumps.



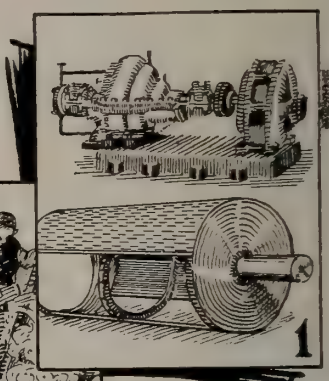
Air Compressors and Air Operated Equipment, Rock Drills, Pneumatic Tools, Steam, Centrifugal and Air Lift Pumps, Air Steam and Electric Hoists, Vacuum Pumps, Barometric, Low Level Multi-Jet and Surface Condensers, Oil Engines, Turbo Blowers, Rubber Machinery, etc.

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In Theory a

In Theory



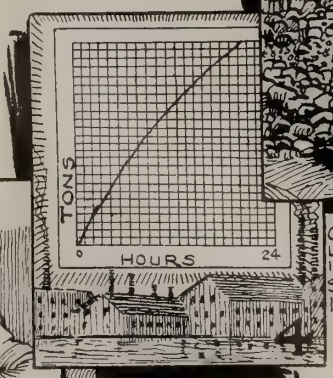
BUILT ON ROTARY PRINCIPLE SIMPLE AND ECONOMICAL. NO PADDLES, DIAPHRAGMS OR OTHER FRILLS TOUCH STOCK.

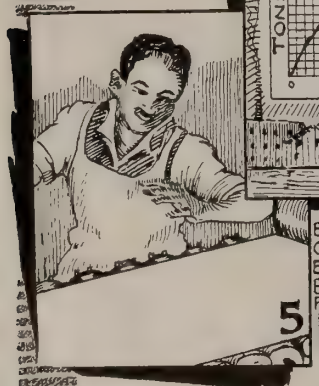


SELF CLEANING SAVES LABOR OF MACHINE TENDERS AND SCREEN BOYS. SCREEN PLATES CANNOT CLOG OR FOUL



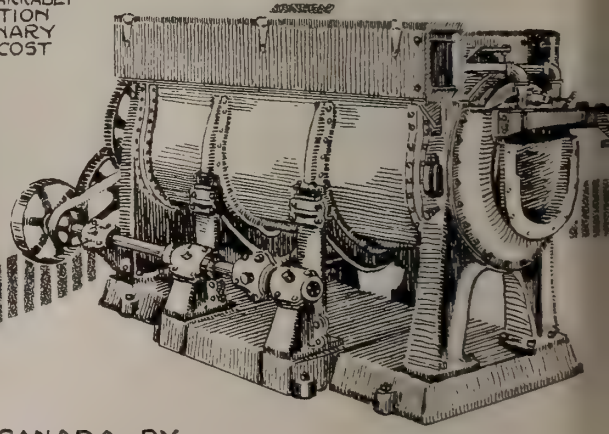
OPERATING COST IS REMARKABLY LOW. POWER CONSUMPTION IS HALF THAT OF ORDINARY SCREENS AND REPAIR COST IS NEGLIGIBLE.





BOOSTS PRODUCTION BY OPERATING CONTINUOUSLY ELIMINATING WET END BREAKS, AND SHUTDOWNS FOR WASHING UP.

HANDLES NEARLY ALL KINDS OF STOCK IN COMMON USE, AND MAKES UNIFORMLY CLEAN PAPER



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BIRD INWARD FLOW ROTARY

d Practice

In Practice

"The first Rotary Screen made that is universally satisfactory for use on news machines on this continent that I know anything about. Eliminates slugs which are to a large extent the cause of bad breaks."

"We have found the Bird Screen satisfactory and like it very much."

1

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EAST ANGUS
P.Q.
BROWNVILLE BOARD CO
BROWNVILLE
N.Y.

"We have found Bird Screens very satisfactory for screening the stock going directly to our paper machines. They have reduced the causes for lumps, slime, etc., which are inheritant in other types of screens, that have come under our observation. The last order fully equips all of our paper machines with Bird Screens."

2

FINCH, PRUYN & CO. INC.
GLEN FALLS
N.Y.

"The writer is glad to say that the Bird Screen is working satisfactorily. The best testimony regarding the performance of this screen that we can give you is that three more have been ordered and we hope these will give as good satisfaction as the one we now have."

3

BROWN COMPANY
CASCADE MILLS
BERLIN
N H

"The screen has exceeded our expectations. Wet end breaks have been reduced, production increased and the paper is free from slime spots. Before installation we feared it would not have the required capacity on long fibred stock. Our fears were unfounded as we are able to handle 2,600 lbs. of bleached sulphite per hour with ease."

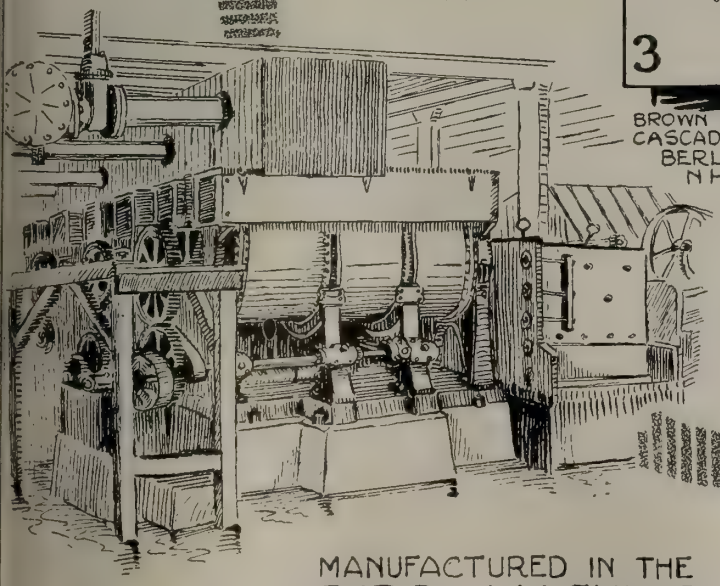
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GROVETON PAPER CO. INC
GROVETON
N H.

"We have eight screens at the Deferiet Mill on News, one at Black River on Manilas and Specialties and one at Dexter on Greaseproof Paper and find that they work equally well on all these classes of stock. The paper is cleaner than before and is free from foreign material which, usually collects in other makes of screens. The writer feels that we could not afford to dispense with these screens and do not hesitate to recommend them to anyone desiring the cleanest class of stock."

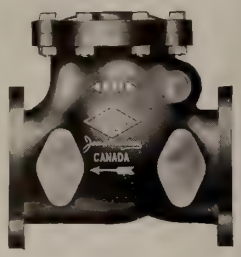
5

ST. REGIS PAPER CO.
WATERTOWN
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BIRD MACHINE COMPANY
EAST WALPOLE MASS.
T H. SAVERY JR. WESTERN REPRESENTATIVE 1630. REPUBLIC BLDG. CHICAGO.

PAPER SCREENS



Jenkins
Iron Body Swing Check Valve
Suitable for 150 lbs. working pressure. Tested to 300 lbs. hydraulic pressure.

You'll Know JENKINS VALVES By This Trade Mark

TRADE JENKINS MARK
Jenkins Bros



Fig. 402
Jenkins
Standard Iron Body Gate Valve
"Type K"



Jenkins
Brass Gate Valve
Type "K"
Suitable for 125 lbs. working steam pressure, 175 lbs. working water pressure.

It is cast upon the body of all Jenkins Valves, Brass, Iron and Cast Steel — the distinguishing mark of unvarying trouble-free service under every condition of usage everywhere.

Whatever type or size of valve you need there's a Jenkins Diamond Marked Valve just made for that particular purpose.

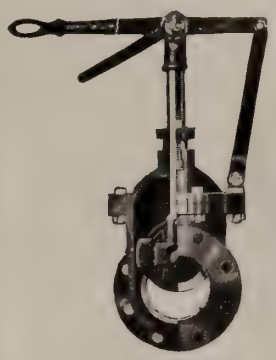
Remember — some 57 years of valve manufacturing skill and experience is behind the Jenkins Trade Mark. It therefore pays to look for it when buying and to refuse the so-called "just as good" imitations of the genuine Jenkins.

Get copy of Catalog No. 8 — free on request.

Enquiries solicited for Acid Valves and Fittings.



Jenkins
Y or Blow off Valve
Suitable for 150 lbs. working steam pressure, 250 lbs. working water pressure.



Jenkins
Standard Gate Valve with Sliding Stem and Lever
Suitable for 125 lbs. working steam pressure, 175 lbs. working water pressure.

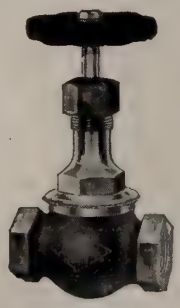


Fig. 106
Jenkins
Brass Globe Valve
Suitable for 175 lbs. working steam pressure, 250 lbs. working water pressure.

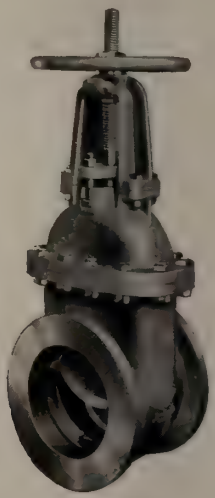


Fig. 404
Jenkins
Standard Iron Body Outside Screw and Yoke Gate Valve

Jenkins Bros. LIMITED

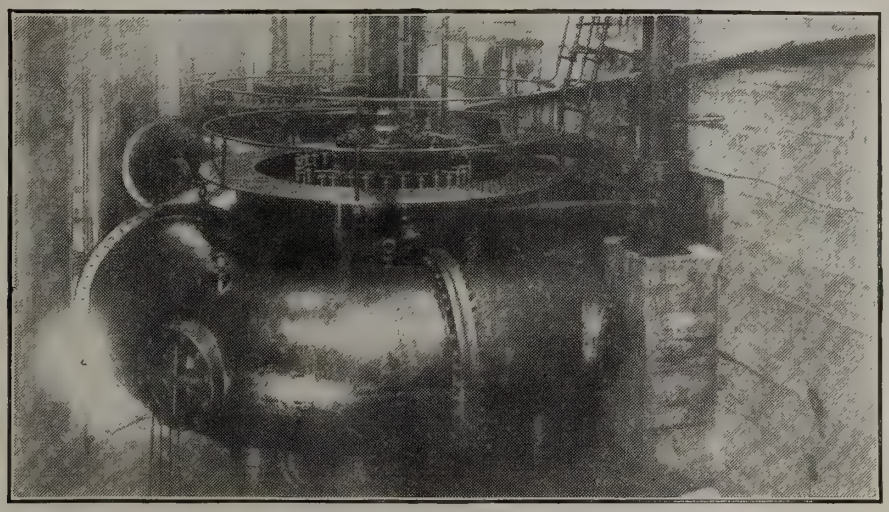
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TRADE JENKINS MARK Jenkins Bros

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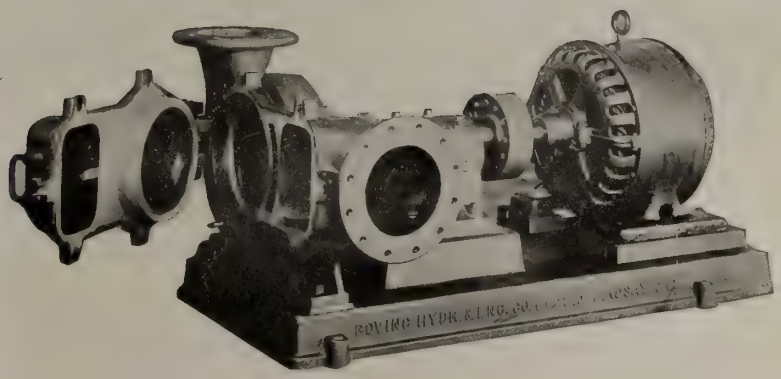
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30 SECONDS



10" Latest "Improved" Stock Pump, direct connected type

Opened for inspection in 30 seconds

How long does it take with your present pumps ?

Our Pumps are guaranteed not to clog. We have them in stock

Sent on trial, if desired

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LINDSAY, - - - Ontario

Are You Buying Pounds of Wool or Paper Felts?

Kenwood Felts and Jackets are woven for the paper maker who is more gravely concerned over the performance of a felt—how it wears, what it does, wherein it profits—than interested in the quantity of wool used to bring these results about.

Such an executive will find three important outstanding characteristics in all

Kenwood Felts and Jackets

QUALITY of Wool is the first characteristic
STRENGTH of wool is the second characteristic
CONSTRUCTION for longer life, for greater service, for a drier sheet is the third characteristic.

Choicer Wool, greater skill and better machinery are required to construct a felt for such a combination, yet—

Measured by RESULTS, by OVERHEAD COSTS, by ACTUAL SAVINGS Kenwood Felts and Jackets are an ECONOMY.

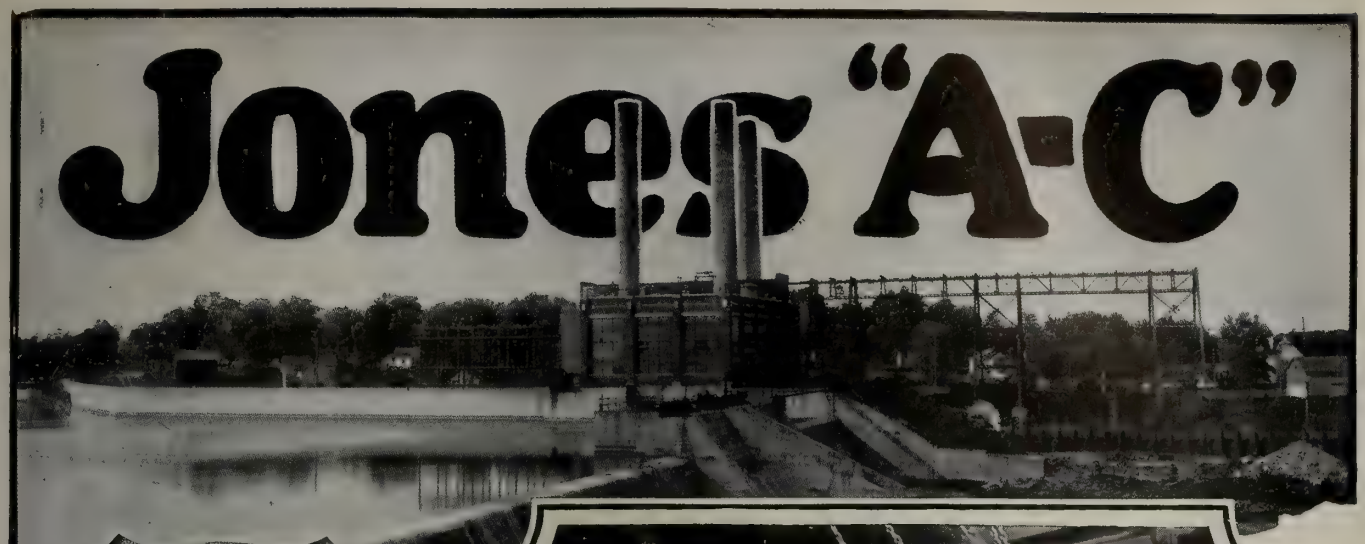
There is a fourth outstanding advantage to the paper maker in that Kenwood Felts and Jackets are priced on the square foot basis—a basis unaffected by temperatures or moisture content—a basis that enables the paper maker to know in advance and at all times exactly how much he will be called upon to pay to clothe a given machine.

If interested in RESULTS and LOWER PRODUCTION COSTS try Kenwood Felts.

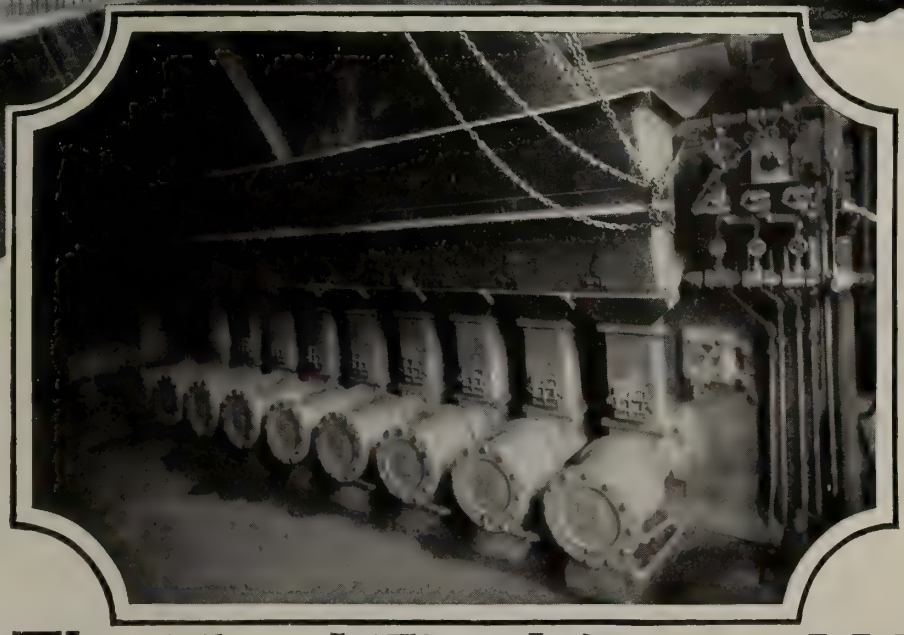
Kenwood Mills, Ltd.,

Arnprior, Ontario, Canada.

Jones "A-C"







The economies effected by Jones "A-C" stokers in connection with this large hydro-electric development are even more gratifying to paper mills of every size

DOOMED—The Hand-Fired Paper Mill

PROGRESSIVE paper mills can no longer tolerate the waste of hand firing. Power represents such a large part of operating costs that the possibilities of increasing profits by reducing fuel and labor cost are easily realized.

Since hand firing won't do — install a real high-duty stoker

Many stokers are merely substitutes for hand firing. By eliminating the waste of hand firing they effect economy — but not as great economy as is possible through **real** high-duty stoker firing. Small plants as well as large plants today regard a stoker as a means of **economy** instead of an expense. First cost is considered only in relation to the dividend it yields.

The Jones "A-C" has proved its ability as a dividend producer by perfectly fulfilling the rigid requirements of high-duty stoking.

Its extreme simplicity — only one moving part, none in the fire — reduces maintenance and practically eliminates shut-downs.

The under-feed principle of combustion — a principle originated in the Jones Stoker — provides maximum combustion efficiency, ability to burn poor grades of coal, and heavy overload capacity.

The automatic-cleaning feature and special tuyere construction overcome objectionable formation of clinkers on front, side, and bridge walls.

Automatic control of fuel and air insures even steam pressure under widely varying load demands.

What single investment will yield as great return as high-duty stoker firing? The new Jones "A-C" catalog explains this new coal and labor saver in detail. Ask for a copy.

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British Columbia: E. A. Earle, Limited, 739 Hastings St. W., Vancouver, B. C.

Manitoba: W. W. Hicke & Co., 567 Banning St., Winnipeg

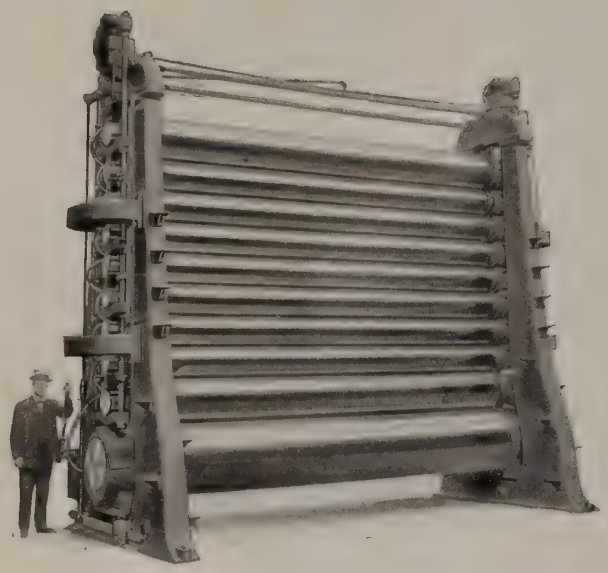


JONES Stokers are made in Canada by Canadians and are sold for Canadian money at par. Through special arrangement the extensive engineering resources of the Under-Feed Stoker Co. of America are made available for Canadian power users. Thus this strictly Canadian Stoker is backed by world-wide experience and unequalled engineering ability.

The Under-Feed Stoker Co. of Canada, Ltd. 81 Victoria St. TORONTO

High-Duty Stoker

Since 1848



You know that, however good your calender rolls are, it takes care to keep them true and fit to produce the quality you demand in your paper. The rolls become worn and perhaps scored with usage.

We are, therefore, offering Farrel roll grinders as the most economical method for you to keep your rolls in shape.

Farrel grinders are precise machines—they play their part in the quality of Farrel rolls in the manufacture, and will play the same part in regrinding your used rolls.

WE had to buy our rolls in England then, because they were not made in this Country. In 1848 Franklin Farrel founded the Farrel Foundry and Machine Company. He built machinery to carry rolls and it was one of his ambitions to make his own rolls instead of buying them abroad.

About 1865, therefore, we began to make chilled rolls and Mr. Farrel lived to see the day when instead of importing rolls for his machines, he exported Farrel chilled rolls to Europe and all over the world.

We have specialized on paper calender rolls and have made more of them than any other chilled roll manufacturer. We know the chilled roll proposition and you can benefit by our experience by specifying Farrel rolls.

FARREL

Established 1848

Foundry & Machine Company

Ansonia, Conn.

Branch Plant:
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Representing

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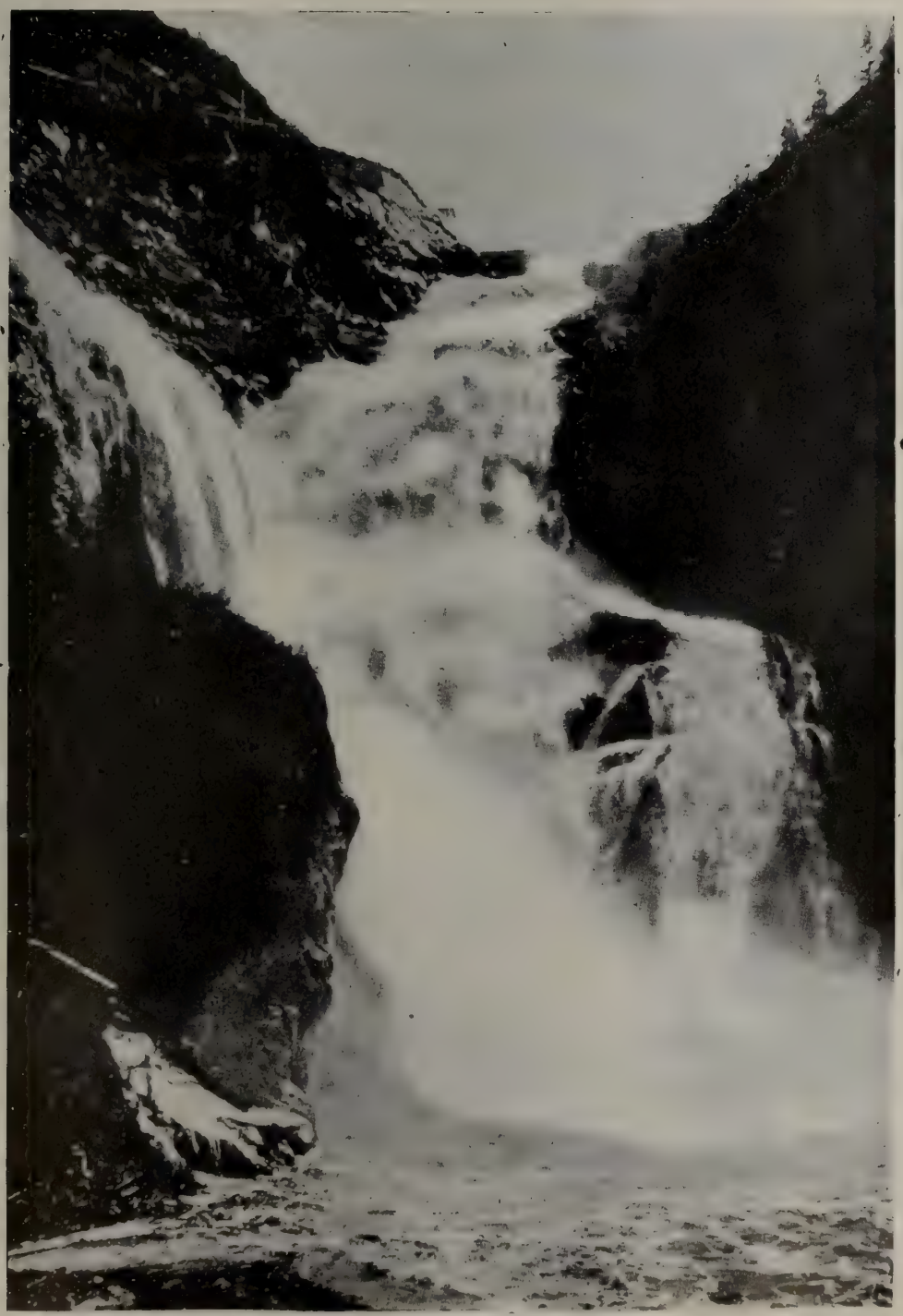
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The Canadian Fairbanks-Morse Co., Limited

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A Canadian waterfall ready to be harnessed to the Pulp and Paper Industry.

FAIRBANKS-MORSE

Not only supplies and equipment but machinery

Because The Canadian Fairbanks-Morse Co. Limited is considered Canada's Departmental House for Mechanical Goods, it must not be forgotten that it is also Canada's foremost heavy machinery house and that it regularly supplies most of the machinery installed in Canada's Pulp and Paper Mills.

Several hundred pages of the Fairbanks-Morse general catalog are devoted to machinery for every purpose and the specifications comprise a valuable help when purchasing additional equipment.

And if the index does not list exactly what you are looking for, our nearest Sales Office will send you detailed information regarding any special equipment.

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Canada's Paper and Pulp Industry

A year ago the publishers of the Pulp and Paper Magazine conceived the idea of presenting a comprehensive and up-to-date review of the Pulp and Paper Industry of Canada with special articles on the history and development of practically all of the important Canadian producers. A number of special articles of practical and general interest were also included.

The distribution of that volume was very extensive and because of the hearty reception accorded it the publishers have decided to prepare a second International Number. As far as possible, the features of the first number, which proved to be of such interest and value, have been retained, but the very great change in industrial conditions has made necessary some alteration in the treatment of the subject. The Pulp and Paper Industry of Canada and concerns catering to this trade, have, as they have always done, recognized the value of the Pulp and Paper Magazine as a medium for introducing themselves and their hearty cooperation in the preparation of this number is greatly appreciated.

In the little more than a year which has elapsed since the last special number, a number of important changes have taken place. Reference has been made to the general business depression and from this the Pulp and Paper Industry has not entirely escaped, although it must be said that this industry has passed through a very trying period with perhaps less misfortune than most industries of anything like the same magnitude. The industry in Canada has been particularly fortunate as compared with fellow paper makers in other countries, in fact there appear to have been only two or three serious financial reverses while a number of proposed new plants and plant extensions have been postponed for the time being. The industry, on the whole, is in a very healthy condition and is very rapidly recovering from a state of debilitation from which industry in general has been suffering.

The splendid position and condition of Canada's Pulp and Paper Industry is undoubtedly due to three principal factors, Canada's unparalleled supplies of hydraulic power, her unsurpassed timber producing areas convenient to these powers and the organization of the industry for the manufacture of products which are least affected by the business depression. While the industry is, for the most part, engaged in the production of the staple grades of pulp and paper for which the world markets exhibit the greatest demand and for which there is the greatest possibility of export, the Canadian mills do not by any means neglect the markets for the grades for which there is a somewhat smaller, but nevertheless fairly steady, demand and in these special grades it will be hard to find papers of finer quality than those produced by our Canadian plants. The manufacture of these special

grades is continually increasing so that Canada is not only becoming less and less dependent on imported supplies, but is gradually working into a position where their exportation can be properly undertaken.

Water power enters largely in making Canada's principal items of paper manufacture. Newsprint requires about 75% of groundwood and its production is largely a question of power. Wrapping papers take from 25 to 75%, boards take large quantities, depending upon the grade. Large amounts of this pulp are also made for export. The recent introduction of successful electric paper machine drives promises to revolutionize paper machine operation as to speed and uniformity and we are apparently not far from the time when steam for cooking pulp and drying paper will be made more cheaply from our inexhaustible water powers than from high priced imported coal.

The insurance of our water supply is largely a matter of the preservation of our forests and there is an ever growing conviction on the part of the public that Canada's industrial welfare is closely bound up with the perpetuation of the forest because of the dependence on the timber industries for the employment of the population in the manufacture of products for which there is an important domestic as well as an ever growing export demand. This is likely to result in the near future in a satisfactory Dominion wide program for forest conservation. With the forests properly safe-guarded, there is no doubt whatever of the preeminence of Canada's position as a paper producing country.

The extent of Canada's water powers has been quiet definitely ascertained and changes in statistics relating thereto, have to do principally with changing the figures for undeveloped and developed powers as this resource is made available for use. In contrast to this knowledge of our water powers, is the serious lack of comprehensive and definite information with regard to our forests. Figures available are at the best only estimates, even at the time they are presented and these are being continually changed by the annual devastations by fire, insects and wind. The inventory of our timber supplies is by no means accurate nor up-to-date, but the introduction of the air-plane, both for survey and protection, promises to develop oint an agency by which reliable and up-to-date information can be procured. Perhaps the best guess at the present time is the work of the Commission of Conservation. The Commission of Conservation, based upon investigations made in the field and upon more or less superficial estimates, has estimated the total pulpwood resources of the Dominion as 1,033,370,000 cords, divided among the provinces as follows: Nova Scotia, 30,000,000 cords; New Brunswick, 33,000,000 cords; Quebec, 300,000,000 cords; Ontario, 200,000,000 cords, or a total of 563,000,000 cords of spruce and balsam in Eastern Canada. In Western Canada, according to this authority, there are 370,370,000 cords. British Columbia is credited with 285,379,000 cords of Sitka spruce, western hemlock, balsam and cottonwood, while the prairie provinces are estimated to contain 85,000,000 cords of spruce and balsam and 100,000,000 cords of poplar, all suitable for the production of woodpulp.

These figures, as has been stated, need to be accepted with reserve. Their reliability has never been established. Further-

more, they include much wood that is commercially inaccessible as well as stands too limited for practical operations. Neither is all of the wood here referred to available for conversion into pulp, since the manufacture of lumber naturally absorbs much spruce and balsam. Nevertheless, the figures give some sort of a rough idea of Canada's immense pulpwood resources and the basis upon which the industry has been built up and upon which its future development depends.

One of the most promising results which appears likely to follow and in fact must follow, from realization of actual conditions of the forests due to the previous methods of exploitation and the ravages of forest enemies is the establishment of timber plantations on a regular crop basis. Important work is under way in order to determine costs of planting and rates of growth and to ascertain to what extent nature can be depended upon to bring about a satisfactory reproduction on logged over and burned over areas. The cultivation of timber is likely to increase although the immense stretches of sparsely timbered areas now not commercially accessible, will undoubtedly be made use of to some extent while what might be called cultivated areas are coming to a productive state.

We not only find the Pulp and Paper Industry of Canada one of the very foremost of our manufacturing activities but one of the first historically. There were not many people in the Dominion when the first mill was established in 1803 and the story of paper making from that day to this is almost a fairy tale, so rapid has been the growth, especially in the last ten years. In fact the value of the exports had, in 1921, practically doubled the figures for 1919. The falling off in the total value of exports during the last nine months has been due rather to the slackness of business of foreign customers for Canadian pulp than to a decrease in the demand for Canadian paper. Considering the satisfactory rate of increase in demand and production at the present time, we may be confident that the industry has begun a new decade which will show a continuation of the remarkable progress that has already been made.

The rapid growth of Canada's export trade in pulp and paper products, already alluded to, is shown in the following statement, covering the fiscal years 1912 to 1921, inclusive:

Year.	Paper and Mfrs. of	Chemical Pulp	Mechanical Pulp	Total
1912	3,885,881	1,587,533	3,506,770	8,960,186
1913	6,341,088	2,100,842	3,408,702	11,850,632
1914	12,690,549	2,923,083	3,441,741	19,055,373
1915	15,500,064	4,806,622	6,801,011	27,107,697
1916	20,042,806	4,459,539	3,575,537	28,077,882
1917	26,107,824	14,032,920	6,371,133	46,521,877
1918	37,865,330	19,133,813	6,487,079	63,506,222
1919	49,165,795	30,226,856	4,479,915	83,862,566
1920	63,253,419	33,000,063	8,383,419	104,636,901
1921	92,103,307	55,060,219	16,491,818	163,655,344



Mr. PERCY B. WILSON,
President of the Canadian Pulp and Paper Association.
(See Biograhpical Sketch, page 138.)

Canada's Water Powers

During the past two years there has been under way in the Dominion Water Power Branch a careful re-analysis and computation of Canada's water power resources. All existing stream flow and power data available from Dominion and Provincial sources, have been systematically collated, analysed and co-ordinated with a view to preparing on a uniform basis from coast to coast revised estimates of the power available. While the analysis is not yet finally completed, sufficient progress has been made to warrant the publication of the following figures:—

The total available and developed power resources are presented in a manner not heretofore adopted. A consideration of the figures will indicate that they place the water power resources of the Dominion in a much more favorable light than have previously published compilations.

While the resources have been exhaustively analysed in so far as the information available will permit, it should be kept in mind that only very meagre data is to hand in many districts and for many rivers.

Basis of Computation.

The figures listed in the accompanying table are based upon rapids, falls and power sites of which the actual existent drop or the head possible of concentration is definitely known or at least well established. Innumerable rapids and falls of greater or lesser power capacity are scattered on rivers and streams from coast to coast which are not as yet recorded, and which will only become available for tabulation as more detailed survey work is undertaken and completed. This is particularly true in the more unexplored northern districts. Nor is any consideration given to the power concentrations, which are feasible on rivers and streams of gradual gradient, where economic heads may be created by the construction of power dams, excepting only at such points as definite studies have been carried out and the results made matters of record.

In brief, the figures hereunder are based on definite rapids, falls and power sites and may be said to represent the **minimum water power possibilities** of the Dominion.

The power estimates have been calculated on the basis of 24-hour power at 80 per cent. efficiency, on the basis of "Ordinary Minimum Flow" and "Estimated Flow of Maximum Development." The "Ordinary Minimum Flow" is based on the averages of the minimum flow for the lowest two consecutive seven day periods in each year, over the period for which records are available. The "Estimated Flow for Maximum Development" is based upon the continuous power indicated by the flow of the stream for six months in the year. The actual method to determine this flow is to arrange the months of each year according to the day of the lowest flow in each. The lowest of the six high months is taken as the basic month. The average flow of the lowest seven consecutive days in this month determines the maximum for that year. The average of such maximum figures for all years in the period for which data are available is the estimated maximum used in the calculation.

The estimated maximum development is based upon the assumption that it is good commercial practice to develop wheel installation up to an amount, the continuance of which can be assured during six months of the year, on the assumption that the deficiency in power during the remainder of the year can be profitably provided from storage or by the installation of fuel power plants as auxiliaries. The correctness or otherwise of this assumption for any particular site can only be definitely settled by the careful consideration of all circumstances and conditions pertinent to its development. The method, however, enables us to make a fairly satisfactory overall estimate of the maximum hydraulic power available, as distinctive from the estimated ordinary minimum power available.



A power site in New Brunswick awaiting development.

Available and Developed Totals.

The recorded power available throughout the Dominion under conditions of ordinary minimum flow and within the limitations set out in the foregoing, is 18,255,000 h.p. The water power available under estimated flow for maximum development, i.e., dependable for at least six months of the year is 32,076,000 h.p. (For details see table attached.)

There are installed throughout the Dominion water wheels and turbines to the extent of 2,471,000 h.p. However, it would not be correct to place this figure in direct comparison with the maximum or minimum available power figures quoted above, and therefore deduce the percentage of the available water power resources developed to date. An allowance must be made for the average ratio between the water wheels installed and the power available.

An analysis of the water power plants scattered from coast to coast, concerning which complete information is available as to turbine installation and satisfactory information as to steam flow, gives an average machine installation 30 per cent. greater than the six months flow maximum power. Applying this, the figures quoted above therefore indicate that the at present recorded water power resources of the Dominion will permit of a turbine installation of 41,700,000 h.p. In other words, the present turbine installation represents only **5.9 per cent.** of the present recorded water power resources.

Progress During Past Year.

In spite of the outstanding facts that financial and commercial conditions are still far from normal and that costs of construction are almost prohibitive for all but absolutely necessary undertakings, there has been during the past year and is now, marked activity in hydro power construction. This has resulted from a variety of causes, principal among which is the lack of native coal in the central industrial district and the fortunate location of economic water power sites to industrial centres.

The total hydro power development installed during the past year or now under construction represents approximately 560,000 h.p. of installed capacity. This figure includes only the initial installation of plants under construction, not their ultimate designed capacity. It is evidence of the manner in which the water power resources of the Dominion are being put to effective and productive use.

Future Growth in Utilization of Water Power.

It is profitable to consider the history of water power utilization in Canada during the past few years in conjunction with the present activity with a view to making some reasonable forecast as to its probable future growth. Should the rate of water wheel installation during the past fifteen years be maintained there will be installed in 1925, 3,360,000 h.p.; in 1930 4,110,000 h.p.; in 1935, 4,860,000 h.p. and in 1940, 5,600,000 h.p. In view of the increasing appreciation of the advantages of hydro power combined with the fortunate location of ample supplies within easy transmission distance of practically every great industrial centre throughout the Dominion, there is every reason to anticipate that the rate of growth in utilization will be accelerated rather than retarded. Reference to the foregoing totals of water power available will indicate that this anticipated increase in utilization will not seriously reduce the total reserves. Canada possesses sufficient reserves of water power to meet all anticipated demands for many years to come.



The Laurentide Power Co. develops 160,000 H.P., part of which is consumed by Laurentide Co.'s mills seen in the back ground.

In order to ensure the most beneficial utilization of these reserves, and to provide intelligent guidance for their development, two essentials are required:—

1st.—An accurate knowledge of the location, capacity and the engineering and economic possibilities of development of the water powers throughout the Dominion, together with their relationship to other natural resources of mine and forest, to industrial centres and opportunities, to transportation systems —rail and navigation, to coal and fuel supplies, to irrigation, drainage and reclamation projects, to alternative sources of power and to market for the uses of power in general.

2nd.—A sound governmental administrative policy designed to protect the public from inadvisable and ill-designed power schemes and to provide for reasonable regulation and revision of rates and rentals, and at the same time to ensure satisfactory guarantees for the encouragement of legitimate investment in hydro power enterprises.

True conservation of our water power resources, which are inexhaustible through use, lies, not in the withholding them from development, but in their efficient utilization in the public interest for the economic exploitation of our other natural resources, and for the conservation of our exhaustible fuel supplies.

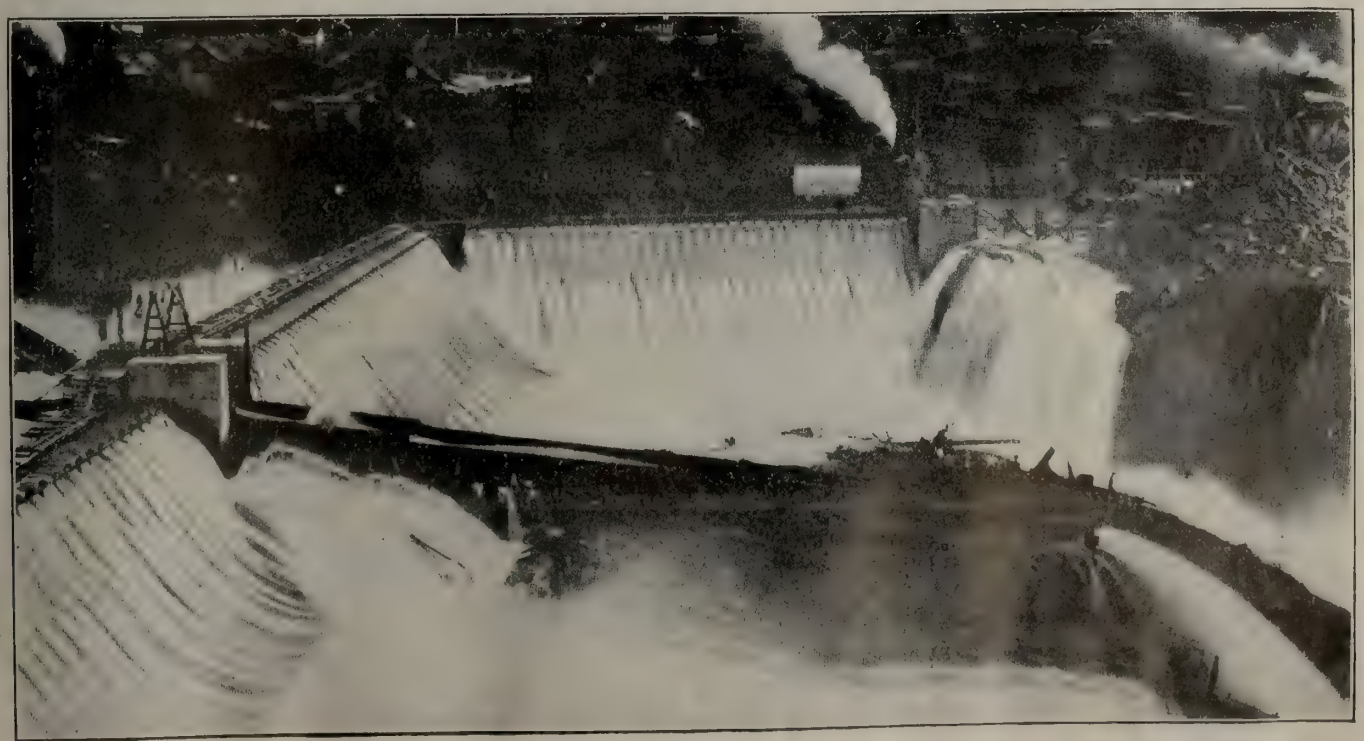
The water power now developed in Canada represents an investment of $475,000,000. In 1940, should the rate of growth in installation during the past 15 years be continued, this investment will have grown to over $1,000,000,000. The present development represents an annual equivalent of 18,500,000 tons of coal, which, valued at $8 per ton, represents $148,000,000. In the year 1940 these annual figures will, with the foregoing assumption, have become 42,000,000 tons and $336,000.000. These figures are striking evidence of the outstanding importance and necessity of an intelligent administrative policy governing the development of our water power resources.

J. T. J.

AVAILABLE AND DEVELOPED WATER POWER IN CANADA.

Province	Available 24-hr. power at 80% efficiency: At ordinary min. flow	At est. flow for max. dev. (Dependable for 6 mos.)	Turbine Installation
	h.p.	h p.	h.p.
1	2	3	4
British Columbia	1,931,142	5,103,460	304,535
Alberta	475,281	1,137,505	32,492
Saskatchewan	513,481	1,087,756	
Manitoba	3,270,491	5,769,444	83,447
Ontario	4,950,300	6,808,190	1,052,048
Quebec	6,915,244	11,640,052	925,972
New Brunswick	50,406	120,807	21,180
Nova Scotia	20,751	128,264	35,774
Prince Edward Island	3,000	5,270	1,933
Yukon and Northwest Territories	125,220	275,250	13,199
	18,255,316	32,075,998	2,470,580
		able for 6 mos.)	lation

The figures listed in Columns 2 and 3 in the above table represent 24-hour power and are based upon rapids, falls and power sites, of which the actual existent drop or the head possible of concentration, is definitely known, or at least well established. Innumerable rapids and falls of greater or lesser power capacity are scattered on rivers and streams from coast to coast which are not as yet recorded, and which will only become available for tabulation as more detailed survey work is undertaken and completed. This is particularly true in the more unexplored northern districts.



The Power behind the Powell River Pulp and Paper Co., Powell River, B. C.



The Water Powers of Labrador are not included in this article. This picture shows the majesty of Grand Falls.

annealed, then to the machine shop to be cut off. The engineer answered him with all the dignity of a second

The figures in Column 4 represent the actual water wheels installed throughout the Dominion. These figures should not be placed in direct comparison with the available power figures in Columns 2 and 3 for the purpose of deducting therefrom the percentage of the available water power resources developed to date. The actual water wheel installation throughout the dominion averages 30 per cent. greater than corresponding maximum available power figures calculated as in Column 3. The figures quoted above, therefore, indicate that the **at present recorded water power resources** of the Dominion will permit of a turbine installation of **41,700,000 horse power.** In other words, the present turbine installation represents only **5.9 per cent.** of the present recorded water power resources.

The above figures may be said to represent the **minimum water power possibilities** of the Dominion.

As illustrative of this the detailed analyses which have been made of the water power resources of the Provinces of New Brunswick and Nova Scotia have disclosed most advantageous reservoir facilities for regulating stream flow, and it is estimated that the two Provinces possess within their respective borders 200,000 and 300,000 commercial horse power. These figures provide for a diversity factor between installed power and consumers' demands.



The Gouin Dam at La Loutre on the St. Maurice. This structure impounds the largest volume of artificially stored water in the world.

A Successful Experiment in Cooperation

"THOSE DAMN CHEMISTS."*

By A. D. WOOD
Champion Fibre Co., Canton, N. C.

First impressions are said to be lasting ones, and when it was suggested that I might present a paper to the Superintendents' Association relative to co-operation between the operative and technical forces in the pulp and paper mill, my mind recalled its first impression of the technical men.

This was about 1890, and sulphite pulp manufacture, a comparatively new industry in this country, had a poor reputation, its best known product at that time being pungent odors.

We were standing at the base of the de-oxidized bronze digesters, and as the boss removed the sponge from his nose (sponges saturated with ammonia were much in vogue at that time) he said, "If they'd keep them damn chemists and engineers out of here we might get something done."

Now, I was only a kid, new in the mill life, and I didn't know anything about chemists and engineers until after he classified them but it seemed to be the unanimous verdict of the crew that Old Joe was right. No one present attempted any rebuttal of his statement. It was evident that they were of a class which deserved condemnation.

I am taking it for granted that there are many here to-day, who like myself, are classed as "ol' timers." Probably a large number of us "quituated" from school instead of being graduated. A lot of us didn't wait for any commencement exercises, we just commenced when we got ready. They wouldn't let us run a school, so we thought we'd try a pulp or paper mill.

And maybe it wasn't all our own choice. Perhaps we were of the legion of youngsters who were absolutely compelled to quit school and go to work to help support mother and the folks. At any rate, we made a startling change in courses and teachers.

During our first few weeks in the mill, we made rapid progress. We learned to chew black plub tobacco. We conquered the art of coloring a short-stemmed Henry Clay pipe. We added to our vocabulary (thanks to the third foreman in the boiler house, who used to sail the lakes). He taught us Boiler House Rhetoric. During the first few months of service, the newest kid on the job used to be the errand boy. We often went to the blacksmith shop, the carpenter shop, the pipefitting or to the machine shop, with minor repair jobs, and while we were waiting we were always learning how things are done. Everywhere we went we heard shop-talk and often the fellow who indulged in the most talking was guilty of the least straight thinking. He wasn't the class of man you'd pick out to-day to act the part of private tutor to your boy. Taking it all in all, it was at best, a one-sided education. Our self-appointed teachers, were often dominated by prejudice, and it was from them that we absorbed the idea that the technical man in the mill was a kind of "fly-cop", a policeman working on a piece rate basis, who made an extra dollar or two for himself everytime he could get a fellow in trouble.

As the years went by, we were promoted from job to job and then we were thrown in direct contact with the technical man, the fellow with the "booklarnin". Many of these men were foreigners, unaccustomed to American ways, others were home grown, but they were not our kind of people. We felt that they felt above us. They didn't know us, we didn't know them, and they didn't invite us to get acquainted. Sometimes, they'd ask us to do things and sometimes we'd do them. Other times, they'd tell us to do things and you remember what happened.

Why They Failed to Get Together.

Let me relate one or two experiences, illustrating the way we failed to get together. I was about twenty-one and a "boss" in the sulphite. A man who said he was a chemist had been sent out in the mill, and instructions were issued to our force to give him all necessary assistance in putting up some apparatus. His claim was that he could bleach sulphite pulp with waste sulphite liquor and we assembled the experimental equipment. He'd been on the job a week or two when one morninf he came to our lead-burner with a cast iron flange and a leather strap and ordered him to solder them together. When he was told it couldn't be done, he lost his temper. Our lead-burner asked him what he was going to do with the flange and trap, thinking he might suggest a method of fastening the two materials together, which would answer the purpose, and he flew into a rage and said, "You have my orders and it makes no difference for what I want it." Along about that time, the sulphite mill crew, boss and all, lost interest in the man and his scheme.

Sometime later, I was visited one morning by a nice old chemist who had been in the laboratory for years. He approached me with the question, "What do you know about differential calculus?" I told him I didn't know anything about it and asked if it was some kind of a breakfast food. He proceeded: "Well, Albert, the recording instruments which I have in mind for use in your department will indicate with absolute accuracy the most infinitesimal increment—." I can't remember the rest of his speech. It wasn't in the vocabulary of my esteemed instructor, the third fireman. Within an hour I was in the "lab" and he was out. A dictionary lay open on the table and I saw it was open at "calculus" and I read that it had to do with the doctrine of infinitesimals and I couldn't help feeling that he'd prepared my course in higher mathematics for me that morning and ran out and served it while it was hot. What was his motive in using that high-brow stuff on me? My only answer was that he wanted to impress me with his own importance and my own inferiority.

In this mill there was also an engineer and he pulled one way, the chemist the other and the mill man was the other corner of the triangle. The engineer has tipped me off more than once as follows: "They're in trouble in the paper mill, and they'll lay it to the sulphite. The chemist has woke up again; you'd better run out in the mill and change something; it don't make any difference what you change, as long as you do something different." Somehow that kind of "dope" didn't increase my respect for either of the two departments.

Another Instance.

One other instance that happened when I was just a kid. I was at work in the wood room and a man who held the position of engineer came down to the wood room boss and told him to have me take a chipper knife and file three inches off the end of it. The wood room boss suggested taking it to the blacksmith and having it

* Paper read at the New York meeting of the American Pulp and Paper Mill Superintendents' Association.

This evidence of unfairness on the part of the working lieutenant: "You have my orders, let the boy file it as it is." The boy went to work and with each stroke he had a rasping thought of that engineer.

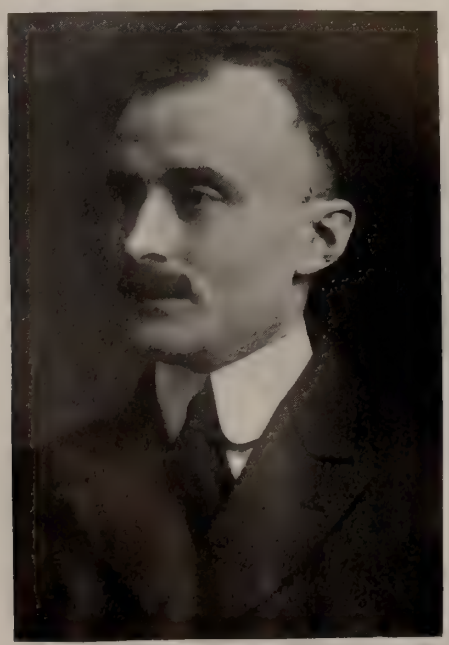
I have cited these instances feeling that many of you have gone through similar experiences and that you have suffered the same reactions. Now let me tell you of another chemist. One morning the manager summoned me to his office and introduced me to a chemist whom he told me would be with us for a time. He said, "I want you fellows to get together and come in with your suggestions. There is always a chance for improvement. Thresh out the things you can't agree upon and then we'll talk things over."

We not only worked together, but we went fishing together, we went to the races together and there we lost the idea that either of us knew anything about what was going to happen It was before the days, of the eighteenth amendment and we actually got—acquainted. Our environment in the early days had been so different that we found that we would interest each other. I found that I wanted to be able to think straight, like he did. There wasn't anything underhanded in anything he did. That is the type of technical men I have been meeting since.

Why This Man Was Welcomed.

In preparing this paper for your consideration, I asked myself the question: What was it that made me welcome this man to the mill? Why did I do everything within my power to further his work? Why did he always listen patiently to my side of the discussions which arose?

One of the correspondence schools, in a course which is termed, "Salesmanship", lays great stress upon the importance of securing "favorable attention," and in answering the above question, I firmly believe that the attitude of the "big boss" toward both of us, securing our "favorable attention" and arousing our interest in the job before us, had much to do with the successful co-operation which followed. He didn't tell the chemist to go down in the mill and "shadow" the "super." He displayed confidence in each of us. He showed us equal respect. It was the attitude of justice and fair play.



OLIVIER ROLLAND,
Manager, Mont Rolland Mill, Rolland Paper Co.

Right here, I would like to make a suggestion to the big boss himself, the manager of the whole works, the one who hires both the "super" and the technical man.

If he happens to be the head of a household, when he's off duty in the mill, I would suggest that he make a survey of his home and satisfy himself that it isn't really scientifically managed, at least that there is room for improvements. Then I would recommend that without saying anything to his wife, who supervises the home, that he employ a few experts to come in and analyze the conditions as they exist, that he place a fuel expert in the kitchen and at the furnace, put a time study man on the trail of the cook and systematize the work of any other servants.

I am not taking the stand that he hasn't a perfect right to do all this and more, but let him try it for a week or two and see if he is inspired during his leisure to write poems about "Home, Sweet Home". He may learn, during the experiment or the working force, something of the way the mill "super" and crew feel under the same conditions.

On the other hand, if he would have a little heart to heart talk with his wife, explaining to her that he's been thinking about improving the home by the installation of labor-saving equipment and the application of better methods, that an electric sewing machine, dishwasher, range, vacuum cleaner, etc., might prove good investments, and suggests bringing a man home with him to look things over, one who is recognized as an expert on these matters, who would confer with her and make his suggestions, the chances are that before he gets a block away from home the next morning she'll be over at the house of a neighbor boasting about what a dear, thoughtful, considerate husband she had and how *we* are going to improve *our* home.

The expert who comes to work under conditions such as these will enjoy to the fullest, the co-operation of the operating department.

Change in Chemists and Engineers.

Doubtless, some of you men here have seen, as I have, a change in the chemists and engineers. Perhaps you have changed yourself as I have. May be you have a son that is a technically trained man, as I have, and as you have watched his development you've been forced to admit that our modern schools and colleges are institutions which teach fair play. It may not be taught under that name, but it is the spirit of the organization, and my sympathy goes out to the young graduate who first enters the pulp mill as a chemist, to be thrown in contact with the pupils of the third fireman referred to in a previous paragraph. Said fireman was a thorough teacher along some lines, but you'll admit, with me, that he was a little lame in his ethics. It is at this time, during the first few days in the mill, that the technical man and the man on the job are apt to arrive at a complete misunderstanding.

I read a few days ago, an article relative to the work of the chemical engineer in the pulp mill, and the author, evidently himself a chemical engineer, was carrying a "first impression" of the operative force in the acid room of the sulphite mill. He relates how the only space available for a "lab" was in a room over the acid plant, and the chemist was there subjected to gas attacks, deliberately made upon him by the acid makers.

force in that particular room of that particular mill was evidently his introduction to the practical men of the mill. The spirit shown was something new to him. He had been brought up in a different atmosphere and he couldn't understand it. Very naturally he assumed that the working force was against him. He formed his opinion of practical men just as I did of the chemists when Old Joe told me about them away back in my boyhood, and now he has written an article, the reading of which will probably lead some manager to believe that his working force is crooked and unfair to the experts he employs. I was wrong in my opinion then and I think he is now. I do not believe there is a superintendent here that would tolerate any such warlike practices in his mill. I do not believe there is a superintendent here but who will meet the technical man half way in any fair and square deal.

Would Endeavor to Get Together.

If I was a technical man about to install some new system of operation in the acid plant, I would endeavor to get the superintendent, foreman and the acid makers together and I would outline the program, telling them exactly what we expected to accomplish. I would probably say something like this: "Boys, when you put on a new pair of shoes they are apt to be uncomfortable for a day or two; when you put on the woolen suit last winter it wasn't as pleasant to your body as the B. V. D's., but you wouldn't have been as well off in the old shoes or the summer clothes. This change we are making in the plant may mean some inconveniences, perhaps you'll be sore, maybe you will be irritated, but we want to carry the thing through as outlined and you will find that the change will be for the best." I would further tell them: "I can't do this without you practical men, you can't do it successfully without a trained chemist; together we can do it."

Some engineers and chemists are doing things like this. The most of them are showing more tact than in former years. Perhaps it isn't exactly tact, it may be good sportsmanship. It isn't sportsmanship for a university graduate to subject the victims of a pulp mill education to ridicule, simply because he has had opportunities the other fellow couldn't afford, so he doesn't do it. It isn't sportsmanship for the man trained in mill details to lead the technical man into blunders and then poke fun at him, so he has cut that out. I believe that the day of these things is past and that the time is here when the operators and technical directors, with mutual understanding and mutual respect for each other, are uniting their forces in the true spirit of service.

At the Champion Fibre Co.'s Plant.

Some of you may ask what is done at the plant of the Champion Fibre Company at Canton, N. C., where I have been for the past eleven years, to encourage co-operation between the technical and operative forces, and how it works, and I do not hesitate in saying that I believe the daily meetings of the heads of departments, as arranged at our plant is a tremendous help in exemplifying our Champion Motto of "Co-operation, Good Fellowship." I might add here that this motto is posted in every room in the office and mill, from the private office of the vice-president to the place where we burn the brimstone. It is even in the "lab" and the engineering department.

When the whistle blows for twelve noon, the executive heads from the president down, go to the "Y" which is located near the mill and office, and there we play tennis, hand-ball, volley-ball, swim, bowl, play billiards or get on the side lines and rest. Play stops at ten minutes before one, giving the players time to take a shower and get to lunch at the main office at one o'clock. This noon-day meal is served at company expense to the "cabinet" or "dinner crowd." The line up is as follows: President, vice-president and general manager, secretary and treasurer, auditor, soda mill superintendent, sulphite mill superintendent, sulphate mill superintendent, board mill superintendent, woodlands superintendent, plant engineer, designing engineer, superintendent of maintenance and construction, superintendent of power, superintendent of extract, chief chemist, service men (safety, etc.,) paymaster and sales manager.

A Round Table Meeting.

At the table, we generally discuss the games played and who lost and why. After lunch, we go to the smoking room and the vice-president and general manager leads the meeting which is a decidedly informal one. Generally he has a list of the matters which he wishes to discuss and after these are disposed of, each one present is free to bring up any subject pertaining to mill matters. Instead of the "super" being compelled to visit various departments in the mill during the forenoon he can jot down matters he wishes to discuss and find his men open to interview at this gathering. Everyone gets an idea of what the other fellows are doing, how one department affects the other. The engineer's plans, the problems of the chemists and the dilemma of the mill can be discussed in the friendliest way. No one resents the suggestion of the other fellow. There is the same spirit of comradeship during the play-hour, the lunch-time and the conference that you would expect to find among a bunch of good fellows off on a fishing trip. The chief chemist is "George," the head of the engineering department is called "Ced" for short, and I answer to the title of "Father." Suppose a man did feel a little grouchy along in the early forenoon, he would hesitate about telling "George" or "Ced" to go plumb to hell, when he knew he would have to eat dinner with him that day.



HON. F. N. McCREA,
Brompton Pulp and Paper Co.

Strengthening the Fraternal Feeling.

Another thing at our plant which puts the technical men on a good footing with the mill men, the room foremen and "key" men is the fact that they teach vocational educational classes which are held at the "Y." Here the key men come to a realization of the fact that the tech man is interested in them, is their best friend, is helping them to prepare for promotion. Here the technical man develops a feeling of brotherly interest, the feeling that we all have when we have rendered real service.

The whole scheme carried on at the "Y", in which the men in the executive class, the men from the office and the men from the mill all play together, let the best man win, strengthens the fraternal feeling. I can think of no better evidence of this than the remark of a pipe fitter, which I overheard one evening last winter down in the shower room. The boys were discussing a game just played and he spoke up: "I'll tell you one thing, them damn chemists and engineers are the best damn fellers in the whole damn bunch."

The practical man is often annoyed by what seems to him to be the theoretical bunk of the college man. The extent of their annoyance is measured by the capacity of each for human tolerance. Tolerance comes from fraternizing, however, more often than fraternizing comes from intolerance.

Herbert Spencer maintained that we must live before we act. Perhaps educated people would hesitate to take issue with Herbert Spencer, but Herbert Spencer never amounted to much in the sulphite mill, and there is no reason why a sulphite graduate shouldn't show him where he is wrong. The fact is that we have to act before we can live. We have to use our muscles before we get them. If we wait till we get muscle before we use it, we won't get any. It's the same with our brains. I don't understand how this is so, but it is so. The only way to learn anything is to do it. We have to swim before we really know how to to swim. We have to make paper before we know how to make paper. And the chemist has to make experiments before he knows how they are made.



W. G. MacNAUGHTON,
Secretary, Technical Association of Pulp and Paper Industry.

It seems to me that much of our failure to co-operate is neither the fault of the technical man or the "super," but comes from the fact that the mill and the school were not doing the same thing. The two ought to be brought together from the start, instead of having their separate graduates find ways of getting together afterwards.

It used to be a pet phrase with us that there is a vast difference between theory and practice. It would be about as sensible to say that there is a vast difference between a horse's neck and horse's hind end. There is a difference, to be sure, but not the sort of difference implied in the statement. If the hind end doesn't synchronize with the front, the horse won't win, even by a neck.

There can be no discrepancy between correct theory and correct practice. No two facts ever contradict each other. If knowledge isn't practical, it isn't knowledge and if practice isn't scientific, it isn't practical.

Where the Trouble Lies.

To the technical men I'd say: The trouble lies not in any conflict between our facts and yours, but in the fact that we had been learning different things. We had been to school, although neither you nor we were aware of it. We had been doing things, therefor we had been learning things. And the things that we learned were just as valid as the things that anybody has learned.

The problem is: How can you get engineering facts to fit in with operative facts? There is only one answer. We must begin to learn together. But because we learn only by doing, that means that we must begin to act together.

The story I told you of the Champion Mills may seem almost childish. I meant it to seem childish in its simplicity, for except as "Ye become as little children ye can in no wise enter into the kingdom of knowledge."

How It Is Figured Out.

We figured it out this way. There are some things at least which we could all do—chemists and engineers and mill "supers" alike. There was one thing we were all good at, so we began there. We could all eat very efficiently. From that we went into more involved processes—like playing tennis and taking a bath. Now we are learning to make paper together and we find it fun. I hope we don't stop there. I hope the mill men and the school men of these United States keep on doing things together. I hope we mill men do our part. I hope we contribute our little discoveries in practical production to the broader knowledge of the scientist, until the school and the college and the university shall be woven more tightly into our national life. And I hope that you technical men shall show us eventually how to transform our factories and mills into institutions of culture, so that every worker shall have the fullest opportunity for mental and spiritual development and we shall learn the ultimate truths of life by DOING them.

India and The Middle East As a Market For Paper.

H. R. POUSSETTE, Director, Commercial Intelligence Service for Canada.

[It should be noted that the nominal value of the rupee is now 2 shillings, or one-tenth of the gold contents of a sovereign. Its actual present value is about 1s. 4d. to 1s. 5d.; just over a year ago it was 2s. 10d. A lac of rupees is 100,000 rupees; a crore equals 100 lacs. In India the rupee is divided into 16 annas, and the annas are further subdivided into 4 pice. In Ceylon the rupee is divided decimally.]

Beaverboard.

Up to the present there has been practically no demand for beaverboard, as very little has been known about it in India, and those who have been familiar with it apparently have been under the impression that it would not withstand either the conditions brought on by the monsoon or the attacks of the white ants and borers. Canadian beaverboard is now being handled by one of the large firms in Calcutta, and it is fully anticipated that, owing to the manner in which it is prepared, it will prove impervious to the ravages of the white ants. If this proves to be correct, there should certainly be an excellent market for beaverboard for use in cheap construction, and the whole of the trade might very well be secured by the Dominion, and indeed should be.

Paper.

The total imports of printing paper into India for the fiscal years 1917-18, 1918-19, and 1919-20 were respectively 189,875 cwt., 194,603 cwt., and 200,684 cwt., and for the month of March, 1920, the imports were 34,338 cwt. In 1919-20 the United Kingdom supplied 48,410 cwt.; United States, 46,960 cwt.; Norway, 74,914 cwt.; and Sweden, 26,239 cwt. These figures showed some changes from the year 1917-18, when Japan imported 27,106 cwt., whereas in 1919-20 her trade had fallen to practically nothing. The United States and the United Kingdom have largely increased their trade, the former from 17,694 cwt. and the latter from 26,253 cwt.The trade of both Sweden and Norway has slightly diminished.

Considering the position which Canada occupies as a manufacturer of paper, she should have no difficulty in capturing the greater part of the trade in newsprint. A certain amount of Canadian paper is now coming into the market, and the agents say that they can find a ready sale for any quantity up to 500 or 600 tons a month. Printing paper is imported both in rolls and in bales, the largest newspapers taking the former. One of the largest houses in India put the importation of paper in rolls for the whole country, including Burma, at from 4,000 to 5,000 tons per annum.

Newsprint.

Newsprint comes out in bales. It is of the same quality as the rolls, and is packed 500 sheets to the ream, basis 18 inches by 22 inches, 8 pounds to the ream. As the statistics show, Scandinavia is still very strong in the paper trade, the business in which is usually done through London, and it is very possible that part of the supplies credited to the United Kingdom originate in Norway and Sweden.

Newsprint is made in India from grass. While anticipations that bamboo may furnish material for supplies have been formed, one of the firms most interested stated that the process is still in the experimental stage. An importer in Bombay, speaking of the Indian newsprint, said that it was very much higher in price than Scandinavian, and that while in August last the latter was quoted 70 shillings per ton c.i.f. Bombay—which works out at about 4¾ annas per pound—one of the largest mills in India quoted him 8 annas per pound Calcutta, which shows a very great difference. In addition to the higher price, the Indian paper would have to pay railage from Calcutta to Bombay.

Unglazed newsprint is employed to quite a large extent for such articles as text books in the vernacular, Bengali almanacs, etc.

Local mills, in addition to ordinary newsprint, make quite a good light-weight unglazed grade of Badami paper, which is a biscuit-colored paper used for such cheap lines as account books, scribbling pads, and theatre programs.

It is very important that newsprint exported to India should be well packed. Complaints have been made as to carelessness shown by some United States exporters.

Stationery.

Imports in stationery amounted in the fiscal year 1919-20 in value to about Rs. 45 lacs; which is a considerable increase over the two previous years; the weight is not given. For the month of May, 1920, the imports were valued at nearly Rs. 7 lacs. The bulk of the stationery was imported from the United Kingdom with over Rs. 23 lacs, while the United States came second with Rs. 13 lacs.

Canadian paper is now known on the Indian market, and it is to be hoped that with the steamship connec-



T. J. STEVENSON,
Riordon Sales Corporation.

tions which have been recently established, this trade will work up into one of great profit; and considering Canada's exceptional position in this industry it will be unfortunate, if she does not take a commanding position within the next five or six years.

The imports of other kinds of paper amounted in 1919-20 to over Rs. 75 lacs, which is Rs. 2 lacs more than the previous year but Rs. 25 lacs less than in 1917-18. The statistics do not show the countries from which these were obtained, but it can be safely assumed that the principal suppliers were the United Kingdom, the United States, and Scandinavia. Inquiries have been made for book paper, bank paper, and wrapping paper from Canada. Book papers are wanted down to 12 pounds per ream. It is necessary to note that paper which has a watermark must show the country of origin—i.e., there must be incorporated in the watermark the words "made in Canada" on each sheet. As with newsprint, care must be taken in the packing of other classes of paper where it is contained in cases, every precaution should be taken when nailing down to avoid damaging the contents. The packing of Scandinavian paper shipped to India bears an excellent reputation—a reputation that is borne out in other parts of the world.

So far as Indian competition is concerned one manufacturer stated that he hardly expected that makers would be able to hold their own in newsprint when once business becomes normal, whenever that might be, or with the highest grade of paper. The product of India is not entirely made from local raw material, but is also manufactured from imported pulp.

Canada at the present time is exporting very large quantities of newsprint and other classes of paper to the United States, of which it is very possible certain quantities are shipped abroad. In view of this, Canadian paper manufacturers might consider carefully whether it would not be to their ultimate advantage to keep this trade in their own hands, rather than that foreign markets should be supplied through the medium of American shippers. This policy would probably in the end be greatly to the advantage of the Canadian manufacturer, would be providing freight for Canadian steamship lines, and have an indirect influence in helping to sell other Canadian products.

The imports of paste boards, mill board, etc, are of considerable importance, amounting to Rs. 30 lacs a year or approximately £300,000.

Packing Paper.

In this market very little superior packing paper is used, the demand of the bazaar being almost entirely for a cheap make of local paper and for Scandinavian nature brown.

Wallpaper.

The demand for wallpaper in India is unimportant, and although this commodity is not shown separately in the trade statistics, the imports so far as can be judged would not amount to more than Rs. 50,000 to Rs. 70,000 a year. The average Indian does not care for wallpaper, and the vast majority could not afford it. In addition, there are these facts to be considered, that in India wallpaper is considered insanitary as it harbors insects, and that during the monsoon period, which is one of extreme humidity, the paper becomes so damp that it peels off the wall.

Old Newspapers.

All over the Middle East old newspapers are in demand as wrapping paper in the bazaar. It is impossible to say what the import amounts to, as it is not mentioned in the customs statistics, but judging from inquiries it would probably run to a fair amount.—Trade and Commerce Weekly Bulletin.

"He who takes no interest in the general weal and gives no thought for those who are trodden underfoot, save now and then to bestow alms, is not a good citizen."—Henry George.

Yesterday is a memory; to-morrow a hope; to-day is a fact. But tell me would the fact be what it is without the memory and the hope. Are not all these equally real?—Van Dyke.



A raft of British Columbia logs on the way to the mill.

Canadian Trades Routes

By GUY TOMBS, General Traffic Manager, Canadian Export Paper Co., Limited, etc., Montreal.

"And the earth was without form, and void; and darkness was upon the face of the deep."

We do not actually know how life began, but it is evident from sacred writings and fossilized remains, that it originated in the waters. Doubtless millions of years elapsed before we find Man as we know him, and the first record of water transportation was the command to Noah to build an ark of gopher wood with lower, second and third stories for the preservation of the race. It has been computed that the gross tonnage of the "Ark" was 15,000 tons, or a little larger than the well-known "Empress of Britain."

Man's ingenuity has always been active on forms of transportation, and our systems and methods of to-day are the direct results of hundreds, yes thousands, of years of growth and unconquerable resolve.

The origin of ancient forms of carriage is lost in the darkness of prehistoric time, and was probably accidental. Floating logs of driftwood suggested the canoe, rudely hollowed with fire, afterwards with stone implements, while a limb, which in time became an oar, served to propel and guide. The sail followed, but long afterwards, and even in the time of the Phoenicians, the rudder had not been invented.

(Our forces in Mesopotamia found the same wash basin type of fragile boat made of willow or cane and buoyed upon inflated skins, as used for carrying down the great blocks of stone used for constructing the palaces of Nineveh and other Assyrian cities).

Prior to the civilized era, trade was comparatively light and travel infrequent, and the first great common carrier was the Phoenician sailor, travelling on land being unsafe except in strong detachments.

Records show that some of the early Egyptian ships were 420 feet long and carried 400 soldiers, 4,000 rowers (4-6 banks of oars) and 300 sailors, but these seem large figures. There are also records of rowboats in India as long ago as 2500 B.C.

The Mediterranean became the home of hardy sailors—the Bible refers to the ships of Tyre. (It might be said that the rude raft of the South Seas, manned by the native savage, represents the origin of water carriage all over the world.)

Canada, no doubt, received earlier Overseas visitors than the hardy Norsemen, followed centuries later by the Cabots, Basque fishermen, Jacques Cartier, Champlain and French fur traders, but no outline of the origin of Canada's trade routes would be complete without some reference to the part played by the Hudson's Bay Company. On May 2nd, 1670, Charles II. granted a charter to "The Governor and Company of Adventurers of England trading into Hudson's Bay," one of the obligations being a search for the "Northwest Passage".

The King's cousin, Prince Rupert, was the first Governor, followed by the Duke of York, afterwards James II. The venture had actually started two years previous, when the small 50-ton ketch "Nonsuch" left the Thames on June 3rd, 1668, reaching James Bay September 29th. The voyagers spent a long and dreary winter at the mouth of the "Rupert" river, returning to England in the summer of 1669 loaded to the waterline with a rich cargo of furs. These privileges, however, did not long remain exclusive; the aggressive French traders continuously endeavored to tap the region by way of the Great Lakes and on several occasions the Company forts on Hudson Bay were captured and held by French fleets, the last time being 1782, or 23 years after the fall of Quebec.

Practically all the explorations and discoveries in the Northwest were made by employees of the Hudson's Bay Company or its later rival, The North-West Company, which was operated by very keen and efficient Montreal Scots—the two companies amalgamating in 1821.



Mr. Guy Tombs.

In August, 1914, France was not organized to provide the enormous supplies required by the War. The Hudson's Bay Company was appointed Purchasing Agent for all goods which the French military administration might require from Canada, United States, Great Britain and elsewhere. This agreement was afterwards enlarged to include grain, flour and foodstuffs provided by the French Government for civilian needs. During the five years between 1915 and 1919 the Company transported safely on this account more than 13,000,000 tons, operating at one time over one million tons of ocean tonnage. A fleet of grain carriers, etc., left Montreal every week. In this period munitions from France to Russia and Roumania were also transported under the Company's flag. The Company service is now back to normal, with occasional ice-scarred supply ships for Labrador and Hudson Bay. It is confidently hoped by the



Railway tracks and warehouse at the Montreal wharves.

West that a stream of grain will reach Great Britain through Hudson Bay as soon as the railway to Port Nelson is completed.

Our trade routes, as we know them, developed from regular sailings in 1819 between the Clyde and Canada by the small Allan Line brig "Jean". The regular connection maintained for so many years began with the brig "Favourite", commanded by Captain Alexander Allan in 1825. This vessel was followed by many more small, full-rigged ships, famous in their day, such as the "Britannia", "Albian", "Canada" and "Caledonia". The first two steamers were built in 1852, the "Canadian" and "Indian", and the second two in 1855, the "Anglo-Saxon" and the "North American". On this date the first mail contract was entered into. Many sailing ships were built and run subsequent to this date, the last being in service up to the early 'nineties. Some of the Allan boats were the finest crossing the Atlantic, notably the old "Parisian". (The Allan Line was absorbed by the Canadian Pacific Railway on January 1st, 1916.)

The best days of the sailing ships were in the 'fifties, 'sixties and the early years of the 'seventies, the days of the China tea clippers and the Australian wool clippers, such marvellous vessels as "Ariel", "Tae-Ping", Cutty Sark" and "Thermopylae". The death blow to sail as the premier method of propulsion on the ocean came with the opening of the Suez Canal in 1869 and the general adoption of the compound engine in 1870. (At the present time but 6 per cent. of the ocean going tonnage of the world is sail.)

The first ship to cross the Atlantic wholly propelled by steam was the good ship "Royal William", the hull of which was built in Quebec and the engines in Montreal. This vessel was launched at Quebec on April 27th, 1831, and was intended for the run between between Quebec and Halifax, with freight, passengers and mails, but the service did not pay and the boat was sent over to England on August 5th, 1833, laden with 300 tons of bunker coal and seven passengers, who paid twenty pounds sterling each for the privilege. Owing to one of the engines becoming disabled, it took twenty-five days to go from Quebec to London. This ship was also the first to be equipped with water-tight compartments.

The "Royal William" had an eventful history. Shortly after its arrival in London it was chartered by the Portuguese Government, and a year later by the Spanish Government and converted into a man-of-war named Isabella II. In 1840 the hull was sold to France, the engines being removed and installed in a new Isabella II., which ten years later was lost on the Algerian Coast. A brass tablet on the wall of the corridor leading to the Parliamentary Library, bears this inscription:—

> "In honor of the men by whose enterprise, courage and skill, the 'Royal William'—the first vessel to cross the Atlantic by steam power—was wholly constructed in Canada and navigated to England in 1833. The pioneer of those mighty fleets of ocean steamers by which passengers and merchandise of all nations are now conveyed on every sea throughout the world."

Canada's steamship connections kept pace with her expansions. The present Thomson line commenced with small sailings in the early 'seventies, from Continental ports, taking home grain or general cargo for whatever port could be secured. This trade was continued by sailing ships until 1880, then by small steamers classed about 2500 tons dead weight. This line was acquired by the Cunard interests in 1911, who added five new passenger ships between Montreal and London, and later three freight boats between Montreal and Bristol (Avonmouth). Unfortunately all of these ships were lost in the War. There is now a weekly freight service between Montreal and London in the summer, and to and from London and Portland, Me., in the winter eight new passenger ships are under construction.

The present White Star-Dominion Line commenced business under the chartered name of The Mississippi & Dominion Steamship Company. The first sailings were from Liverpool to Montreal in 1871, the fleet consisting of the steamers "St. Louis", "Vicksburg", "Memphis", "Mississippi" and "Texas", Boston and Baltimore being the winter ports. A few years later Portland, Me., became the winter port, the passenger vessels calling at Halifax. The fleet was steadily



An upper floor on the newest type of transit shed, Montreal



Vessels near the entrance to the Lachine Canal, Montreal.

added to and comprised such popular ships as the SS. "Vancouver" in 1884 and the "Labrador" in 1891.

In 1909 the White Star Line became associated with the Dominion Line, and these companies maintain regular weekly sailings between Montreal and Liverpool in summer and Portland in winter, and a fortnightly freight service between Montreal and Avonmouth. Three large passenger ships are under construction for the Montreal-Quebec-Liverpool run, and the former freight service to the Continent, known as the Canada Line, is being restored.

The Donaldson Line was inaugurated with an occasional steamer in 1875, and in 1878 a regular fortnightly service was started between Montreal and Glasgow. The bulk of the export trade being in the hands of Scottish Canadians, the steamship services naturally favored the Scottish ports. Many of the Donaldson ships were lost during the War, but they are being replaced and a splendid Glasgow service is being maintained.

In 1917 Donaldsons amalgamated with the Anchor Line under the name of the Anchor-Donaldson Line. (Anchor Line boats came to Montreal some sixty years previously.)

An important year for Canada was 1877, the Pacific Ocean connection of the Canadian Pacific Railway being established with three chartered steamers. The first three Empresses were completed and placed in service in 1891, the first trip from Vancouver and Victoria to the Orient being made by the "Empress of India". The Canadian Pacific entered the Atlantic trade in 1903, and as stated previously, acquired the Allan Line in 1916. The C. P. R. holds a dominant position on both oceans, the speed record between Canada and the United Kingdom, and also far eclipses anything afloat on the Pacific. Fifteen passenger ships and eight cargo vessels are operated on the Atlantic, five passenger ships and two cargo boats on the Pacific, and three new passenger vessels are on the ways for the Atlantic and one passenger boat for the Pacific. With these additions, the total gross tonnage will be 379,458 tons. During the War the C.P.R. handled and transported all munitions and supplies from Canada on behalf of the British Admiralty.

In 1886 regular sailings were established between Canada, Belfast and Dublin by the Head and Lord Lines, which Irish service has recently been augmented by the addition of a Continental service, namely Rotterdam and Hamburg. The Head and Lord Lines operate at present seventeen first-class freight ships, of which twelve were built since 1915, and five additional boats are on the stocks.

Elder Dempster & Company, who now run to African ports only, handled many tramp vessels between Canada and the United Kingdom from 1891 to 1895, in which year they established regular lines from Montreal to London and Bristol. In 1899 the Canada Shipping Company (Beaver Line) was acquired, which added a service between Montreal and Liverpool. However, in 1903 their entire North Atlantic fleet, consisting of fourteen steamers, was sold to the Canadian Pacific Railway. A joint South African service was inaugurated in 1902, with monthly boats, and the broad-minded policy of this Company has been of great benefit in extending Canada's trade. (On account of no return-cargo offering from South Africa to Canada, these boats return via England.)

Furness, Withy & Company, Ltd., the well-known British steamship operators, opened an office in Canada in 1893, with a line of steamships from Halifax to Liverpool and London via St. Johns, Nfld. In 1898 a line was established between Montreal and Antwerp and in the same year the Manchester Liners, Ltd., inaugurated their freight route between the St. Lawrence and Manchester. These sailings were followed by participation in a service to South Africa, which has since been discontinued. At present there are fortnightly boats to London and Hull and ten-day sailings to Manchester from Montreal and Quebec in the summer and St. John, Halifax and Portland in the winter.

The New Zealand Shipping Company, Ltd., commenced their service between Montreal and New Zealand and Australian ports in May, 1910, with a monthly service from Montreal in the summer and St. John in the winter, the C.P.R. acting as agents for the first year. As there is not sufficient cargo offering to load these ships back direct to Canada, after the steamers discharge their Canadian cargo in Australia they load for England, and sometimes do not return to Canada for six months. Steamers use the Panama Canal, and the usual itinerary of ports of call are Auckland, Wellington, Lyttelton, Dunedin, Melbourne and Sydney, with occasional calls at Brisbane or Adelaide.

The Canada Steamship Lines have been in the ocean business from their inception if one includes the Que-



Bird's eye view of part of Montreeal Harbor.



The view of the Harbour at Quebec showing grain elevators and Louise Basin.

bec Steamship Company (recently acquired by Furness interests), operating from New York to Bermuda and the West Indies, which was started by citizens of Quebec as a result of the American Civil War. Shortly after the outbreak of the Great War, owing to a serious shortage of ocean tonnage, they fitted out and equipped several ocean services, utilizing twenty-six lake vessels as well as acquiring six large ocean freight carriers. In 1919 they organized La Compagnie Canadienne Trans-Atlantique, commonly known as the Fracanda Line, between Montreal, Havre and Bordeaux, with two ships, and recently the Inter-Continental Transports, Ltd., has been established, with fortnightly freight service to and from Montreal, London and Liverpool. In the winter these ships use West St. John, N. B. The Canada Steamship Lines also maintain a fortnightly service between Montreal, Charlottetown and St. Johns, Nfld.

The Houston Line, operating in conjunction with the Clan Line, started their freight service from Montreal to Brazil and the River Plate on the opening of navigation of 1919, and in 1920 this was added to by a service to India and the Far East, connecting Canada with the principal ports of India, Ceylon, Straits Settlements and the Dutch East Indies.

The Ellerman-Bucknall Steamship Company, Ltd., iaugurated a monthly service in August, 1920, from Canada to India, Strait Settlements and Java, from Montreal in the summer and St. John in the winter. The ports of call vary according to cargo offered, but the usual run is Port Said, Port Sudan, Aden, Bombay, Colombo, Karachi, Calcutta, Rangoon, Singapore, Batavia, Soerabaya and Samarang. Ships are also operated by the same company from Montreal to Oran Algiers, Tunis, Alexandria, Piraeus, Smyrna, Constantinople, Braila, Constanza and Galatz, according to freight offering.

The Canadian Government Merchant Marine, Ltd., consisting of Canadian-built, Canadian-owned and Canadian-manned ships, was a direct outcome of the world shortage of tonnage caused by the War, and became a great factor in relieving the existing congestion and in extending Canadian trade. The first sailing was the SS. "Canadian Voyageur" from Halifax, February 27th, 1919, for the West Indies. (This boat performed the unprecedented feat of steaming from Quebec to Halifax in midwinter.) The next boat was the SS. "Canadian Pioneer", from Montreal to Buenos Aires on May 22nd of the same year.

There are now fifty-eight vessels in service under the direction of the Canadian National Railways, whose present Executive had operated for some five years the fast passenger ships "Royal Edward" and "Royal George" between Montreal and Avonmouth in the summer, and Halifax in the winter—the first sailing of these Canadian Northern ships being May, 1910. The "Royal Edward" was later torpedoed in the Dardanelles, the "George" and three cargo vessels being acquired by Cunards shortly before the ar mistice.

By the end of 1919 the Canadian Government had nineteen ships afloat, aggregating 99,680 tons, operating services from Montreal and Atlantic ports to London, Liverpool, South America, Barbados, Trinidad, Demerara, Cuba, Jamaica, St. John's, Nfld., and Charlottetown, P.E.I. During the year ending December 31st, 1920, twenty-five ships were delivered, aggregating 147,747 tons, thus giving forty-four ships with a tonnage of 247,427 tons in operation on the following services: From Atlantic ports to London, Liverpool, Glasgow, Cardiff and Swansea in the British trade; in the British West Indies trade to Barbados, Trinidad and Demerara, serving the eastern group of islands, and to Bahamas, Jamaica and British Honduras, serving the western group; in the Cuban trade to Havana; in the South American trade to Brazil, Uruguay and Argentine; in the Indian and Far East trade to India, Ceylon, Straits Settlement,



Upper part of the historic harbor of Halifax.

and to Australia and New Zealand; from Pacific ports, to Australia and New Zealad, to India and Straits Settlement, to China and Japan. Fourteen ships were delivered during the first eight months of 1921, bringing the total number of the fleet to fifty-eight, and capacity to 320,000 tons, and when all deliveries have been completed the total fleet will number sixty-six ships, with a tonnage of over 380,000 tons. The Atlantic ships sail from Montreal in the summer, calling at Three Rivers and Quebec if sufficient cargo offers; in the winter the sailings are divided between St. John and Halifax.

That our Canadian ports are nearer Europe than any other ports on this Continent is demonstrated by the following distances to Liverpool:—

From:	Nautical Miles
Halifax, N. S.	2431
Quebec, P. Q.	2625
St. John, N. B.	2674
Three Rivers, P. Q.	2681
Montreal, P. Q.	2760
Portland, Me.	2783
Boston, Mass.	2861
New York, N. Y.	3043
Philadelphia, Pa.	3179
Baltimore, Md.	3335
New Orleans, La.	4532
Galveston, Tex.	4726

MONTREAL is the furthest inland port in the world, being situated 1000 miles from the sea, at the interchange point between ocean and inland navigation, approached by a ship canal with a minimum depth of 30 feet at low water, which is being increased to 35 feet, and linked with a canal and lake system of 1600 miles of inland navigation, extending into the heart of the North American Continent.

The harbor of Montreal has eight miles of completed wharfage, with room for 100 vessels, and over the wharves of this port pass annually about one-third of the entire imports and exports of the Dominion of Canada. In fact, the commerce of Montreal is second only in value to the port of New York among the ports of the North American Continent, although open only seven months of the year, the average season of ocean navigation being from May to November. (In 1921 March 29 to December 14.)

Montreal is also the greatest grain-exporting seaport in the world, with an elevator storage capacity of 11½ million bushels, and this is to be increased. (138 million bushels were handled here in 1921). There are 24 large, well-lighted, double-story, concrete transit sheds, averaging about 500 feet long by 100 feet wide each, also a large ten-story public warehouse and cold storage plant. The port is equipped with three dry-docks; two of them are small graving docks and the third a large floating dry-dock with an elevating capacity of 25,000 tons. There are three shipyards at Montreal, the largest being capable of building any vessel from a dreadnought to a full-sized merchant ship. Montreal harbor has 65 miles of railway tracks, five coal towers, a floating crane and, like all Canadian ports, requires no lighterage. Freight rates to Montreal from the Middle West are lower than to New York and many U. S. shippers use Montreal so as to avoid delays and also get the benefit of paying their ocean charges in Canadian funds.



The commodious and beautiful harbour of St. John, N. B.

The St. Lawrence ship canal has a width of from 450 to 470 feet, is well marked by range lines and lighted buoys, and provides a safe and easy route for vessels up to 20,000 tons, and the lighting and buoying of the channel is such that vessels enter and leave at any time of the day or night, for which the country is greatly indebted to the efficient work of the Department of Marine and Fisheries.

THREE RIVERS (Trois Rivieres) was founded by the French shortly after Quebec. This port is on the north shore of the River St. Lawrence, at its junction with the St. Maurice, and is about half way between Montreal and Quebec. Formerly a lumber centre, it is regaining importance through its proximity to the hydro-electric power developments on the St. Maurice and the big exporting pulp and paper mills of the district. There are two large wharves with 40 feet of water, coal towers, a couple of miles of shore-front, two shipyards, and railway tracks along the wharves. Vessels from Montreal occasionally call to complete loading, and cargoes of coal and sulphur are landed for the paper mills.

QUEBEC occupies one of the most picturesque sites of any city on this continent. Founded in 1608, it was the cradle of New France and of the civilization which now extends from the Atlantic to the Pacific.

Quebec has thirty miles of water frontage, and wharf accommodation for 22 large, ocean-going vessels and countless smaller ships. The average navigation season is from April 1st to December 31st. The average depth of water at the docks is 40 feet. It has also an enclosed wet dock, containing 40 acres water surface, in which the general depth is 25 feet. The harbor possesses two graving docks, one 600 feet long, by 62 feet wide at entrance, and the other 1150 feet long, by 122 feet wide at entrance, with the necessary work shops; two grain elevators have a capacity of 2¼ million bushels. There are two shipyards at Quebec, and the port is equipped with five coal towers, and a new modern bunkering plant is in the course of construction. There are 16 miles of tracks on the harbor, controlled and operated by the Quebec Harbor Commissioners.

The Quebec docks have a surface of about 56 acres and are provided with modern freight sheds, with a floor area of 542,500 square feet. Quebec is endowed with great natural advantages, was Canada's chief port for a great many years, and was the leading timber port of North America when that traffic was at its height. The Canadian Pacific Railway operates three fast passenger ships between Quebec and Southampton, and cargo boats to and from Montreal stop at Quebec for loading or unloading, as traffic warrants. Quebec is also the nearest eastern port to the Canadian West.

ST. JOHN was visited in 1604 by Champlain, but its foundation and progress as a British city was due entirely to the United Empire Loyalists, who came from the New England States in 1783 and founded the city on the Bay of Fundy, at the mouth of the great River St. John.

St. John, always a large lumber-shipping point, came into prominence in the winter of 1897-8, when the Canadian Pacific Railway adopted and developed it for a winter port. In point of volume of traffic, it is the second ocean port of the Dominion, being also our nearest commercial all-year-round Atlantic port. In 1900 the value of exports were barely 10 million dollars, the peak being reached in 1918, when goods to the value of over 200 million dollars were handled.

The port has fifteen ocean berths, three grain elevators with a capacity of 2¼ million bushels, 411,900 square feet of warehouse, four cold-storage plants, and coal bunkering facilities. A dry-dock, 1150 feet long, is under construction. The entrance channel to the main harbor has a depth of 32 feet at low tide



Vancouver Harbour, showing R. N. S. S. "Niagara" and "Empress of Asia" at the C. P. R. Docks.

and 58 feet at high water. Various harbor improvements are under way, the facilities of the port being pressed to the uttermost every winter by the twenty or more lines of steamships operating out of St. John. The port is well served by the C. N. Rys and the C.P.R., and takes the same freight rates generally from Western Canada and the States as New York.

HALIFAX is the nearest equipped port on this continent to the United Kingdom. (During the war the SS. "Olympic" on more than one occasion made the run from Liverpool to Halifax in less than four days.) Originally known as Chebucto, the city of Halifax was founded in 1749, although trading posts must have been established at this point at least one hundred years earlier. The naval experts of those days proclaimed to the British Admiralty that the harbor of Halifax was the finest in the world, and it has always been a great military and naval port. In May, 1758, a fleet of 157 vessels left Halifax to besiege Louisbourg; during the American Revolution troops and warships crowded the streets and harbor; again, in 1812-15, the harbor was the centre of naval activities; and during the War, Halifax was the examination port for all trans-Atlantic shipping, and as many as one hundred large ocean-going vessels could be see in the harbor at one time. Over 350,000 soldiers embarked for overseas at Halifax.

The harbor is only thirty-one minutes' steaming from the open ocean, the rise and fall of tide runs from four to six feet, the depth of water at entrance 33 feet, depth at piers 45 feet, maximum depth in harbor 120 feet, length of harbor 5¼ miles, average width 1¼ miles, shore line 23 miles. At present there are 51 piers and wharves along the water front, of which many are privately owned, but these are exclusive of what are called "Halifax Ocean Terminals," for which the Federal Government has an appropriation of thirty millions, of which some sixteen million dollars have been expended in the construction of magnificent concrete piers and sheds, which will provide accommodation for twenty-seven of the largest steamships afloat. The port is equipped with all modern facilities, has a half-million bushel grain elevator, modern shipyards, and repair plants. The dry-dock has a working length of 560 feet, a width of 102 feet on the coping level and a depth of water below sills of 30 feet.

For many years the principal business on the water front was that of fish, apples, and potatoes, which are shipped from Halifax to the West Indies, Brazil and the Continent, and in the winter Halifax is a great mail port, most of the New York-Liverpool ships making it a port of call.

While on the subject of Halifax, a few words must be said about the part played in ocean navigation by one of its citizens. The Cunard Steamship Company was founded by Samuel Cunard, a native of Halifax, who had a mail service between Halifax, Boston, Newfoundland and Bermuda. A contract was afterwards arranged with the British Government to furnish a mail service between Liverpool and Halifax and Boston, twice a month durinf eight months of the year, and once a month in winter, for which he received an annual subsidy of 60,000 pounds sterling. The original name of the company was the British & North American Mail & Steam Packet Company, later changed to the Cunard Steamship Company. The service was inaugurated by the sailing of the SS. "Britannia" from Liverpool to North America on the 4th of July, 1840, reaching Boston, after calling at Halifax, on the 19th of July. So great was the enthusiasm in Boston, it is said, that Mr.. Cunard, who came out on the "Britannia," received 1800 invitations to din-



A view of the Harbour at Prince Rupert, B.C.

ner during the first twenty-four hours of his stay in the city. The original fleet consisted of four side-wheel vessels 207 feet long, 34 1-3 feet beam and 22½ feet deep, and superseded, as mail carriers the ten-gun sailing brigs of earlier days. The second contract with the British Government for weekly sailings called for a much larger fleet, and four more steamers were built in 1848, of a length of 251 feet. From that time until now the service has been maintained with wonderful regularity, and the line has an unqualified reputation for safety. The contrast between the first steamer, the "Britannia," a side wheeler about the size of one of our river boats, with the mighty "Berengaria" of a gross tonnage of 52,117 tons, length 919 ft., breadth 98 ft., and 62,000 H.P., is very great. (The latter steamer has now been fitted to burn oil instead of coal.) For many years New York has been the America port, but many of the great Cunard ships touch at Halifax on the westbound voyage.

Halifax has always done a big trade with the West Indies. The firm of Pickford & Black was formed in 1875, and in 1888 they went into the steamship business with a service from Halifax to Jamaica, calling at Bermuda. In 1890 they inaugurated a service to the Windward Islands, Barbados, Trinidad and Demerara, and today a fortnightly service is carried on by the Royal Mail Steam Packet Company, with four 5000-ton steamers. The recent trade compact between Canada and the West Indies, by which mutual preferential duties were granted, will lead to considerable expansion of business. Many Canadians spend their winters in the West Indies, whilst numbers of West Indian people like to come to Canada for the summer months.

Turning now to our main Pacific port: VANCOUVER has a magnificent natural harbor embracing 80 miles of water frontage and 40 miles of anchorage, is practically land-locked, and has neither reefs nor shoals. The port has dockage accommodation for 25 vessels, deep sea and coasting; one grain elevator; does a tremendous Oriental business, and ships British Columbia fir all over the world.

The development of Vancouver, like St. John, was due originally to the Canadian Pacific Railway, and until recently that road had the shipping trade, both trans-Pacific and coastwise, largely in its possession, but today many lines are competing for this growing business.

The Canadian Robert Dollar Company established its headquarters in Vancouver a few years ago, and is prominent in Oriental trade. The Canadian Government Merchant Marine is operating services out of Vancouver to Australia, India, the Orient and elsewhere. The Blue Funnel and the Harrison Direct Lines have increased their services from Great Britain to British Columbia, via the Panama Canal, the completion of which has been a great factor in the development of Vancouver as a port, reducing the distance to Liverpool over 6000 miles and the voyage to less than a month. The Royal Mail Steam Packet Company has recently opened an office in Vancouver to take charge of its new service between Vancouver and European ports. The Canadian-Australian Line is adding to its fleet, and the Isthmian Line and the Williams Line are increasing their coast services between New York and Vancouver. A recent survey of the regular liners entering the port of Vancouver states there are nine lines with connections to the Orient, four to Australia, two to British India, ten to United Kingdom and Europe via the Panama canal, three to the United States Atlantic Coast and eight to the Pacific Coast ports of North and South America.

Vancouver has aggressive competitors a few miles south in the ports of Seattle, Tacoma and Portland, and many of the Seattle boats call at Vancouver and Victoria for passengers and cargo. Vancouver is also the headquarters for C.P.R., G.T.P., C.G.M.M. and other coastwise services.

During the War, shipbuilding was established on a



Bristol, England.—View of the Avonmouth Docks.

large scale, and two large shipyards are still being operated successfully.

The climate and location of Vancouver are such that Coast prophets declare it will eventually become the second largest city in the Dominion. With a population of 150,000 people and a metropolitan development in only thirty-six years, it has a pretty good start. Several large wharves are under construction.

The beautiful city of VICTORIA, on Vancouver Island, is principally a mail and passenger port, and Prince Rupert, near the Alaskan boundary, while 480 miles nearer the Orient than the southern ports, still confines its trade to coastwise and fishing.

Nature has been very kind to Canada—her coasts are honeycombed with potential harbors, there are magnificent waterways, we are on the world's main highway and control the nearest ports to Europe on the one hand and the Orient on the other. The North is ours, and Halifax is nearer to the Southern Hemisphere than is New York.

Many other natural and improved ocean ports exist in the East, such as Sorel, Levis, Riviere du Loup, Tadousac, Chicoutimi, Ha Ha Bay, Rimouski, Seven Islands, Gaspe Basin, Campbellton, Bathurst, Chatham, Pointe du Chene, Summerside, Charlottetown, Pictou, the Sydneys, Louisbourg, Lunenburg, Bridgewater, Liverpool, Lockeport, Shelburne, Yarmouth, etc.; and on the Pacific, Powell River, Ocean Falls, Swanson Bay, Port Alice, Anyox, Nanaimo, and Esquimalt, etc.

It has been said that Commerce is the basis of a country's wealth, and the various Governments of Canada have done a great deal towards the development of overseas trade, in which they have been ably seconded by the big Canadian railroads and the shipping companies. To the Federal authorities we owe the splendid facilities at Montreal, Quebec and Halifax, while the Canadian Pacific Railway built most of the docks at St. John and Vancouver. The St. Lawrence Ship Channel and aids to general navigation are Federal controlled. The exports of grain, butter and cheese, etc., have also been greatly encouraged, and Canadian Trade Commissioners are maintained in different parts of the globe; approximately one million dollars in subsidies per year are paid out to steamship companies to offset to some extent the empty inbound voyages. (If Canadians would purchase more abroad these subsidies could be reduced, and, considering the value of the Canadian dollar and the low import freight rates, it is surprising more of this is not done.)

The Canadian railways, prior to the War, devoted a large effort to increasing exports from and through Canadian ports, and are gradually giving this more attention, but if Canadian manufacturers are to stay in the world's markets lower transportation rates are required on their raw materials and the finished article, cannot pay any higher freight to seaboard than similar industries pay in competing countries. Similarly our shipping companies will have to go further towards keeping us on a competitive footing with European exporters. Today we find pulp and paper landing in New York from Gothenburg at a rate of $6.00 per gross ton. (Newsprint has been brought over from Hamburg to New York as low as $4.00 per ton.) Although in the reverse direction the rate from Canadian or United States ports to the United Kingdom is $16.80 per gross ton on newsprint, and no takers. Canadian exporters are further handicapped by being obliged to pay higher insurance premiums than their competitors; for example, the rates from St. Lawrence ports run from 40 to 100 per cent. higher than rates out of New York—the insurance rates on hulls averaging about 15 per cent. higher.

In 1890 Canada's exports of pulp and paper totalled $120,000. By 1912 they had grown to $14,600,000. By 1917 they had nearly quadrupled to $52,000,000. For fiscal year 1918-1919 they ran close to $100,000,000, nearly double what they were two years before. The export figures for fiscal year ended March, 1920, were $113,091,704. For the fiscal year ended March, 1921, they amounted to $163,655,344.



Number	Port	Country.
1	Montreal	Canada
2	Three Rivers	do.
3	Quebec	do.
4	Chicoutimi	do.
5	Vancouver	do.
6	St. John	do.
7	Halifax	do.
8	Victoria, BC	do.
9	Portland	U. S. A.
10	Boston	do.
11	New York	do.
12	Baltimore	do.
13	San Franscisco	do.
14	San Diego	do.
15	Los Angeles	do.
16	Portland	do.
17	Seattle	do.
18	Philadelphia	do.
19	Charleston	do.
20	Norfolk	do.
21	Georgetown, Brit. Guiana	South America
22	Rio de Janeiro	do.
23	Santos	do.
24	Montevideo	do.
25	Buenos Aires	do.
26	Bahia Blanca	do.
27	Nassau	Bahamas
28	Kingston	Jamaica
29	Port of Spain Trinidad	British West Indies
30	Belize	British Honduras
31	Aukland	New Zealand
32	Wellington	do.
33	Lyttelton	do.
34	Dunedin	do.
35	Brisbane	Australia
36	Sydney	do.
37	Melbourne	do.
38	Adelaide	do.
39	Freemantle	do.
40	Honolulu	Hawaiian Islands
41	Capetown	South Africa
42	Algoa Bay	do.
43	East London	do.
44	Durban	do.
45	Delagoa Bay	do.
46	Dakar	West Africa
47	Bathurst	do.
48	Freetown	do.
49	Sekondi	do.
50	Cape Coast Castle	do.
51	Saltpond	do.
52	Winnebah	do.
53	Akra	do.
54	Lome	do.
55	Kotonou	do.
56	Lagos	do.
57	Burutu	do.
58	Port Harcourt	do.
59	Calabar	do.
60	Duala	do.
61	Port Said	Egypt
62	Port Sudan	do.
63	Alexandria	do.
64	Cork	Ireland
65	Dublin	do.
66	Belfast	do.
67	Londonderry	do.



Number	Port	Country
68	London	England
69	Southampton	do.
70	Bristol	do.
71	Liverpool	do.
72	Manchester	do.
73	Hull	do.
74	Cardiff	Wales
75	Leith	Scotland
76	Glasgow	do.
77	New Castle	England
78	St. Nazaire	France
79	Havre	do.
80	Bordeaux	do.
81	Marseilles	do.
82	St. Johns	Newfoundland
83	Karachi	India
84	Bombay	do.
85	Calcutta	do.
86	Madras	do.
87	Rangoon	do.
88	Colombo	Ceylon
89	Singapore	Straits Settlements
90	Batavia	Java
91	Samarang	do.
92	Surabaya	do.
93	Aden	Arabia
94	Oran	Algeria
95	Algiers	do.
96	Tunis	Tunis
97	Piraeus	Greece
98	Smyrna	do.
99	Constantinople	Turkey
100	Yokohama	Japan
101	Tokio	do.
102	Kobe	do.
103	Nagasaki	do.
104	Noji	do.
105	Taku	China
106	Shanghai	do.
107	Hong Kong	do.
108	Dairien	do.
109	Manilla	Philipine Islands
110	Antwerp	Belgium
111	Rotterdam	Holland
112	Hamburg	Germany
113	Danzig	do.
114	Bergen	Norway
115	Stavanger	do.
116	Christiania	do.
117	Gothenburg	Sweden
118	Stockholm	do.
119	Helsingfors	Finland
120	Copenhagen	Denmark
121	Naples	Italy
122	Genoa	do.
123	Trieste	Austria
124	Callao	Peru
125	Mollendo	do.
126	Arica	Chile
127	Iquique	do.
128	Valparaiso	do.
129	Vera Cruz	Mexico
130	Tampico	do.
131	Matamoras	do.

STEAMSHIP SERVICE FROM CANADIAN PORTS, 1921.

LIVERPOOL						
Canadian Government Merchant Marine Limited	Summer	Montreal	Fortnightly	12	days'	voyage
	Winter	St. John	"	14	"	"
Canadian Pacific Steamships Limited	Summer	Quebec	Tri-monthly	6	"	"
	"	Montreal	Weekly	8	"	"
	Winter	St. John	6 per month	7	"	"
Intercontinental Transports Limited	Summer	Montreal	Fortnightly	9	"	"
	Winter	St. John	"	9	"	"
White Star-Dominion Line	Summer	Montreal	Tri-monthly	8	"	"
	Winter	Portland	"	8	"	"
Furness Line	All year	Halifax	Fortnightly	10	"	"
LONDON						
Canadian Government Merchant Marine Limited	Summer	Montreal	Fortnightly	12	"	"
	Winter	St. John	"	14	"	"
Canadian Pacific Steamships Limited	Summer	Montreal	Weekly	12	"	"
	Winter	St. John	"	12	"	"
Cunard Line	Summer	Montreal	"	12	"	"
	Winter	Portland	"	11	"	"
Furness Line	Summer	Montreal	Fortnightly	12	"	"
	Winter	St. John	"	12	"	"
Intercontinental Transports Limited	Summer	Montreal	"	11	"	"
	Winter	St. John	"	11	"	"
GLASGOW						
Canadian Government Merchant Marine Limited	Summer	Montreal	Every 3 weeks	14	"	"
	Winter	St. John	" " "	15	"	"
Canadian Pacific Steamships Limited	Summer	Montreal	Fortnightly	10	"	"
	Winter	St. John	"	10	"	"
Anchor-Donaldson Line	Summer	Montreal	"	9	"	"
	Winter	Portland	"	9	"	"
AVONMOUTH (Bristol)						
Canadian Pacific Steamships Services Limited	Summer	Montreal	Monthly	12	"	"
	Winter	St. John	"	12	"	"
Cunard Line	Summer	Montreal	Fortnightly	12	"	"
	Winter	St. John	"	12	"	"
White Star-Dominion Line	Summer	Montreal	Fortnightly	11	"	"
	Winter	Portland	"	11	"	"
HULL						
Furness Line (Via London)	Summer	Montreal	Fortnightly	17	"	"
(Direct)	Winter	Portland	"	12	"	"
MANCHESTER						
Manchester Liners Limited	Summer	Montreal	Tri-monthly	10	"	"
	Winter	St. John	"	10	"	"
LEITH AND NEWCASTLE						
Thomson Line	Summer	Montreal	Weekly	11	"	"
	Winter	Portland	"	11	"	"
DUBLIN AND CORK						
Head Line	Summer	Montreal	Fortnightly	12	"	"
	Winter	St. John	"	12	"	"
BELFAST AND LONDONDERRY						
Head Line	Summer	Montreal	Tri-monthly	12	"	"
	Winter	St. John	"	12	"	"
CARDIFF AND SWANSEA						
Canadian Government Merchant Marine Limited	Summer	Montreal	Monthly	12	"	"
	Winter	St. John	"	14	"	"

SOUTHAMPTON						
Canadian Pacific Steamships Limited	Summer	Montreal	Fortnightly	9	"	"
	Winter	St. John	"	9	"	"
GOTHENBURG, COPENHAGEN AND STOCKHOLM						
Sprague Line	Summer	Montreal	Fortnightly	17 to 23	"	"
	Winter	Portland	"	17 to 23	"	"
CHRISTIANIA, STAVENGER AND BERGEN						
Norwegian-American Line	Summer	Montreal	Monthly	14 to 19	"	"
	Winter	St. John	"	14 to 19	"	"
NAPLES, GENOA AND TRIESTE						
Canadian Pacific Steamships Limited	Summer	Montreal	Monthly			
	Winter	St. John	"			
HAMBURG						
Head Line	Summer	Montreal	Fortnightly	12	"	"
	Winter	St. John	"	12	"	"
Roger and Webb Line	Summer	Montreal	Fortnightly	15	"	"
	Winter	Portland	"	15	"	"
Canada Line	Summer	Montreal	Every 3 weeks	13	"	"
	Winter	Portland	" " "	13	"	"
ROTTERDAM						
Rogers and Webb Line	Summer	Montreal	Tri-monthly	14	"	"
	Winter	Portland	" "	14	"	"
Head Line	Summer	Montreal	Fortnightly	12	"	"
	Winter	St. John	"	12	"	"
ANTWERP						
Canadian Pacific Steamships Limited	Summer	Montreal	Fortnightly	9	"	"
	Winter	St. John	"	9	"	"
Rogers and Webb Line	Summer	Montreal	"	13	"	"
	Winter	Portland	"	13	"	"
HAVRE						
Canadian Pacific Steamships Limited	Summer	Montreal	Fortnightly	9	"	"
	Winter	St. John	"	9	"	"
Intercontinental Transports Limited	Summer	Montreal	Fortnightly	14	"	"
	Winter	St. John	"	14	"	"
Fracanda Line	Summer	Montreal	Fortnightly	14	"	"
	Winter	St. John	"	14	"	"
BORDEAUX						
Fracanda Line	Summer	Montreal	Fortnightly	14	"	"
	Winter	St. John	"	14	"	"
SOUTH AFRICA						
Elder Dempster and Company Limited	Summer	Montreal	Monthly	30 to 40	"	"
	Winter	St. John	"	30 to 40	"	"
Canadian Government Merchant Marine Limited	All Year	Vancouver	Every 2 Months	40 to 50	"	"
WEST AFRICA						
Elder Dempster and Company Limited	Summer	Montreal	Monthly	21 to 30	"	"
	Winter	St. John	"	21 to 30	"	"
AUSTRALIA AND NEW ZEALAND						
Canadian Government Merchant Marine Limited	Summer	Montreal	Monthly	50 to 75	"	"
	Winter	Halifax	"	45 to 70	"	"
	All year	Vancouver	"	35 to 50	"	"
Canadian Australasian Royal Mail Steamship Company	All year	Vancouver	Fortnightly	21 to 24	"	"
New Zealand Shipping Company	Summer	Montreal	Monthly	40 to 65	"	"
	Winter	St. John	"	40 to 65	"	"
Yamashita Kisen Kaisha Line	All year	Vancouver	Monhtly	35 to 50	"	"

RIO SANTOS, MONTEVIDEO AND BUENOS AIRES						
Canadian Government Merchant Marine Limited	Summer	Montreal	Monthly	25 to 35	"	"
	Winter	Halifax	"	20 to 30	"	"
Houston Line	Summer	Montreal	Monthly	25 to 30	"	"
	Winter	St. John	"	25 to 30	"	"
SOUTH AMERICA (WEST COAST)						
Latin American Line		Vancouver	Monthly	15	"	"
BARBADOS, TRINIDAD AND DEMERARA						
Canadian Government Merchant Marine Limited	Summer	Montreal	Fortnightly	18 to 23	"	"
	Winter	Halifax	"	15 to 20	"	"
WEST INDIES AND DEMERARA						
Royal Mail Steam Packet Company	All year	St. John and Halifax	Fortnightly	3 to 17	"	"
NASSAU, KINGSTON AND BELIZE						
Canadian Government Merchant Marine Limited	Summer	Montreal	Every 3 weeks	9 to 16	"	"
	Winter	Halifax	" "	6 to 13	"	"
KINGSTON, JAMAICA						
Pickford and Black Limited	All year	Halifax	Monthly	10	"	"
HAVANA						
Canadian Government Merchant Marine Limited	Summer	Montreal	Fortnightly	14	"	"
	Winter	Halifax or St. John	"	11	"	"
Canadian Pacific Steamships Limited	Summer	Montreal	Monthly	9	"	"
	Winter	St. John	"	7	"	"
SANTIAGO DE CUBA						
Pickford and Black Limited	All year	Halifax	Monthly	10	"	"
INDIA AND FAR EAST						
Canadian Government Merchant Marine Limited	Summer	Montreal	Monthly	30 to 45	"	"
	Winter	St. John	"	30 to 45	"	"
	All year	Vancouver	Every 2 months	40	"	"
Ellerman Bucknall Line	Summer	Montreal	Monthly	40 to 55	"	"
	Winter	St. John	"	40 to 55	"	"
Houston Line	Summer	Montreal	Monthly	40 to 55	"	"
	Winter	St. John	"	40 to 55	"	"
Canadian Robert Dollar Line	All year	Vancouver	Monthly	40 to 55	"	"
MEDITERRANEAN AND BLACK SEA PORTS						
Ellerman Bucknall Line	Summer	Montreal	Monthly	20 to —	"	"
	Winter	St. John	"	20 to —	"	"
ST. JOHNS, NEWFOUNDLAND						
Canada Steamship Lines	Summer	Montreal	Every 10 days	5	"	"
	Winter	St. John	" " "	5	"	"
Canadian Government Merchant Marine Limited	Summer	Montreal	Every 3 weeks.	7	"	"
	Winter	Halifax	Fortnightly	3	"	"
JAPAN AND CHINA						
Canadian Pacific Steamships Limited	All year	Vancouver	Fortnightly	10 to 21	"	"
Canadian Government Merchant Marine Limited	" "	"	Monthly	20 to 27	"	"
Blue Funnel Line	" "	"	"	18 to 30	"	"
Canadian Robert Dollar Line	" "	"	"	18 to 30	"	"
Osaka Shosen Kaisha Line	" "	"	Weekly	18 to 30	"	"
Nippon Yusen Kaisha Line	" "	"	"	18 to 30	"	"
Admiral Line	" "	"	"	18 to 30	"	"
Frank Waterhouse & Co.	" "	"	Monthly	27	"	"
Furness Whithy & Company	" "	Vancouver	Monthly	16 to 30	"	"
Yamashita Kisem Kaisha	" "	"	"	18 to 30	"	"
A. M. Gillespie Inc	" "	"	"	18 to 30	"	"

HAWAIIAN AND FIJI ISLANDS

Canadian Australasian Royal Mail Steamship Company	All year	Vancouver	Fortnightly	7 to 16	"	"

ADDITIONAL SERVICES FROM VANCOUVER VIA PANAMA CANAL

UNITED KINGDOM

Blue Funnel Line	Fortnightly sailings		30 to 40	days'	voyage
Harrison Direct Line	"	"	30 to 45	"	"
Isthmian Line	Monthly	"	30 to 45	"	"
Johnson Line	"	"	30 to 45	"	"
Holland American Line	Every three weeks		30 to 40	"	"
Royal Mail Steam Packet Line	Monthly		30 to 40	"	"
Unitee American Line	Vancouver Monlhly		30 to 40	"	"

EUROPEAN PORTS (As Cargo Offers)

European Pacific Company	Monthly sailings		30 to 45	"	"
Johnson Line	"	"	30 to 45	"	"
Holland American Line	Every three weeks		30 to 45	"	"
Danish East Asiatic Company	Monthly sailings		30 to 45	"	"
Societe General Transports Maritimes a Vapeur	"	"	30 to 45	"	"
Norway Pacific Line	Occasional sailings		40 to 50	"	"



The end of the journey — Unloading ships at London. (Interchange title on page 85.)



The Laurentide Club House.
This large newsprint mill encourages outdoor recreation.



Provision is made for hearty appetites at the mill by maintaining a well equipped cafeteria, supplied largely by the Laurentide farm and dairy.

Silicate of Soda in Paper Making.[1]

By JAMES G. VAIL, Philadelphia Quartz Co.

Silicate of soda is a material which finds application in a great many branches of industry. Probably no heavy chemical has a wider range of uses. In its diversified applications it has touched the experience of almost every one. Most paper makers are aware that it is used in the manufacture of paper, and that it is added to the beater and precipitated with alum in the same manner as rosin size is precipitated, but only a small number know definitely the properties which its use imparts to paper. Some confusion is found also as to the respective functions of silicate of soda and rosin size in paper. Rosin size is necessary to give water resistance, but, as has been pointed out by Klemm and others, resistance to printers' ink is produced with silicate of soda. A good deal of work has been done in the laboratory to show the nature of the precipitate which is formed from silicate of soda and the conditions under which this precipitate separates from the water in the beater and is retained among the fibres of the paper, modifying the character of the finished sheet.

The observations which are to be here reported are based also on practical experience on large quantities of paper. These have led to a better understanding of the behaviour of silicate of soda in the beater and on the paper machine, and have given a basis for better judgment of the conditions for its successful use.

What Silicate of Soda Is.

Before considering details of handling of silicate of soda, it is necessary to make plain what we mean by this term. Silicate of soda is not the name of a definite salt, but rather the general name for an indefinite number of products composed of silicate (SiO_2) and soda (Na_2O) in varying proportions. Different ratios of silica and soda, along with different concentrations of the solutions give varying properties, both chemical and physical. It is this ability to modify the properties of silicate of soda which accounts for its great variety of uses. Adhesives, plastic cements, quick setting cements, sizings, gels, water softeners, detergents, paints and cements for digester lining are all included in its scope of usefulness. As drawn from the furnace, silicate of soda looks like glass. Like glass, the proportions of its ingredients may be varied within wide limits without much change in appearance. It differs from glass, in that it may be dissolved in water. It comes upon the market in concentrated solution. Much misunderstanding of results harks back to the assumption that silicate of soda is a definite thing, and many published articles report results which it is impossible to confirm or disprove without knowing just what grade of silicate of soda was used. Because two samples of silicate of soda look alike, it does not follow that they are alike. Solutions ranging from 34 to 54 per cent. total solids may have identical viscosity. The body of silicate is no index to the amount of solids present. To avoid confusion, all manufacturers have established certain brands which represent definite compositions of silicate.

To precipitate silicate of soda in paper stock the soda is neutralized with alum. Hence, a silicate with the smallest possible amount of soda should be chosen for reasons of economy. The lowest alkalinity which is practical from a commercial viewpoint is represented by a solution containing 7 per cent. total alkali as Na_2O and a ratio of soda to silica approximating 1:4. A product of lower relative alkalinity is too nearly insoluble to be of commercial use. Failure to completely neutralize the soda will result in an imperfect precipitation on the one hand and injury to the rosin sizing of the paper on the other. A silicate of 1:2 ratio requires twice as much alum to produce a given effect on the paper.

A solution of the 1:4 ratio is a jelly at 37° B. corresponding to 34 per cent total solids. When this is diluted to the concentration corresponding to that which obtains in the beater and a solution of alum is slowly added, the solution becomes more and more turbid until when the solution tests acid a precipitate separates from the solution. Other precipitating agents, such as nitre cake, calcium sulphate or even hard water, will precipitate silicate of soda and when these are used the amount of alum added for the silicate can be proportionately reduced. This is a large factor in some mills. The precipitate is very bulky and light and readily becomes entangled with the fibres, assisting in their retention on the wire and cementing them together. If an insufficient amount of alum be added, no precipitation will occur and without precipitation the advantage of using silicate is lost. It is, therefore, of first importance to see that a sufficient amount of alum is used to give an acid reaction. The



An unusual use for paper. Strips of tan-saturated paper laid over young sugar cane or pineapple shoots are pierced by the sharp plant spike, but weeds are smothered and moisture is conserved.

[1] A paper prepared for presentation at the meeting (cancelled) of the Technical Association of the Pulp and Paper Industry at Washington, October, 1921.

Note: The Pulp and Paper Magazine is indebted to the Harbor Commissioners of Montreal for the use of several cuts in the article on Canadian Trade Routes, pages 77-99.

precipitate contains the elements of an aluminum silicate. It probably contains along with the aluminum silicate both aluminum hydroxide and hydrated silica. Silicate of soda thus differs from rosin size, which begins to precipitate when the first small quantity of alum is added.

The texture of a silicate precipitate depends on the dilution of the silicate and the alum. Under the conditions occuring in the beater a light flocculent product, well adapted to harden and increase the strength of the paper, is produced, but if the chemicals were mixed in a relatively concentrated condition the material thrown out would be granular, sandy or lumpy, just as would be the case if dry alum were mixed with a strong solution of rosin size. When the light flocculent precipitate is dried, it hardens to a horny consistency, too hard to be easily crushed by the hand. In this hard condition, it still retains a considerable amount of water, which contributes largely to its toughness. The apparently dry precipitate always contains at least 25 per cent of water under the conditions of drying paper.

Effects on Paper Quality.

The effects of retaining this material in the substance of paper is shown first of all by an increase in the ash of the paper. A study, involving 550 tons of paper and an examination of 1200 samples gave an average of 15 per cent increase in ash with an average addition of 3.48 per cent liquid silicate based on dry fiber. The amount of dry alum necessary for the precipitation of the silicate was 25 per cent of the weight of the silicate solution. The average retention was 66 per cent of the total silica in the silicate plus the Al_2O_3 of the alum. There is good reason to suppose that the use of larger proportions of silicate, as reported by Blasweiler[2] would not only produce more marked effects on the paper but would be accompanied by a higher percentage retention. Amounts as high as 10 per cent of the dry fiber will make the stock appreciably slower on the wire but this effect was not observed at 5 per cent or below.

The hardness and the finish of the paper were determined by the combined judgment of several experienced paper makers, as we know of no method of reducing these qualities to a numerical standard. From comparison of sheets, which differed only by the silicate content and the alum requisite for its precipitation, the statement is warranted that the use of silicate in every case produced a harder and a smoother sheet. The Mullen tests of the papers in this series when averaged show a gain of 12 per cent in favor of the papers containing silicate. Ink resistance was studied in four different grades of paper by the floating method with standard ink. In three of these grades the papers containing silicate showed better ink resistance than those which contained none, This may be attributed to the increased retention of rosin in the paper, there being no reason to believe that silicate can of itself increase the resistance of paper to water or to an aqueous ink.

In studying the effect of the addition of silicate to the beater, it was observed that the increment of ash increased over a period of several hours, sometimes reaching its maximum as late as seven hours after stock containing silicate came on the machine. This is interpreted to mean that a larger precipitation of the silicate and better retention develops as the white waters from which the silicate has been precipitated are returned to the machine and to the beaters.

Silicate, like rosin size, should be handled in such a way that its alkalinity does not adversely effect the colors used in the paper. Where the silicate is added first and is completely precipitated with alum before the addition of the color no interference with the color has ever been experienced, but it is not safe to add the necessary quantity of alum and then a color sensitive to alkali before the silicate, because when the silicate is added it is certain to be for a short time locally in excess and the full strength of some coloring materials is not restored by the alum. Due to better retention some papers show an improvement in color when silicate is used and when handled with proper regard to its alkaline nature satisfactory coloring is always practicable in papers containing silicate.

From the point of view of maximum retention, the experiments poin to the following order of additions to the beater as the most satisfactory:

1. Silicate.
2. Alum for the silicate.
3. Rosin size.
4. Clay or other fillers.
5. Alum for the rosin size.

Many variation are possible without destroying the effect of the silicate, this being simply the preferred practice.

The grades of paper which have been considered in careful tests include cover, envelope, papeterie, book, writing, kraft, tissue and box board. It would not be reasonable to say that silicate of soda should be used in every mill or even in every mill that requires the properties in which the use of silicate tends to impart, but it has been found possible in some cases to make a paper of acceptable quality with a less expensive furnish and in other cases to secure a grade of hardness and finish not otherwise obtainable. In mills where the trim from combining machines using silicate as an adhesive is furnished to the beaters the resulting paper may be improved by precipitating the silicate with alum. Silicate of soda is always helpful in Bristol boards, because of the cementing action on the fibers which tend to stand up as a fuzz or beard on the surface. This characteristic is also very useful in certain furnishes for wrapping paper and the cheaper grades

[2] Papier Fabrikant 1921, 33, p. 875.



Esprit de corps is a big factor, not only in commercial success, but also in the happiness of a community. East Angus, Que., is noted as the home of the Brompton Pulp & Paper Co., and of the Brompton Club, the live organization that gets up the good times we read about in Brompton News. The picture shows the Club House.

of writing. All paper that is judged by its rattle and snap can be improved by the judicious use of silicate.

As pointed out by Wrede,[3] papers intended for printing may be sized with silicate of soda or with silicate of soda and starch in such a way as to provide all the qualities required in printing and with the added advantage that they are not subejct to discoloration on long exposure to light, as are all papers which have been sized with rosin size. Printing ink is an oily substance and it is possible to produce a paper which gives perfect satisfaction in offset printing without showing much resistance to water. The more general recognition of a distinction between water resistance and oil resistance wll do much to extend the usefulness of silicate of soda in the paper industry.

Silicate of soda is a cheap commodity available in unlimited quantities. It is sterile and odorless and remains so. It is manufactured in a variety of grades, but under precise control, so that a result once secured need not be in jeopardy due to variations in the composition. The addition which it makes to the paper is not susceptible to the influence of light. It helps to retain and cement short fibers in the sheet. Its properties should be investigated in connection with every paper in which hardness and smoothness should be investigated in connection with every paper in which hardness and smoothness of finish is an asset.

To summarize:

Silicate of soda as it appears in commerce is of a number of different types.

The correct type for the paper industry has a ratio of alkali Na_2O to silica SiO_2 approximating 1:4.

It is precipitated by alum and produces hardness and snap, smoother finish and usually a small gain in strength.

Printing papers may be made with silicate without the use of rosin and other papers can be improved by using silicate and rosin size together. Silicate properly applied does not interfere with color. It remains colorless on exposure to light.

It is available and cheap. Practical experimentation is needed to secure its benefits.

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3 Wrede. Wochbl. Papierfabr. 1913. 10, p. 835.

PULP AND PAPER PERSONALITIES.



MR. C. HOWARD SMITH.

Mr. C. Howard Smith, President, Howard Smith Paper Mills, Limited, is one of the outstanding figures in the pulp and paper industry in Canada. He was born in St. John's, Quebec, and was educated in the public schools of that place. In 1895 Mr. Smith served as lieutenant, 6th Fusiliers. Besides being President of the Howard Smith Paper Mills, he is also President of the New Brunswick Sulphate Fibre Company, director of the Federal Paper Company, Montreal, Chairman of the Montreal Branch of the Canadian Manufacturers' Association. He is a Past-President of the Canadian Pulp and Paper Association. Mr. Smith is a member of several leading clubs of Montreal.



A row of attractive cottages at Donnacona, Que.

Manufacture All Kinds of Boards.

The Canadian Paperboard Company Limited with a capacity of over 125 tons of board per day can now boast of being the largest manufacturers of paperboards in Canada.

This Company was formed in 1920 with a Dominion Charter to take over the assets and business of The Northumberland Paper & Electric Company Limited of Campbellford, Ont., and the assets and business of the Canada Box Board Company Limited, at Frankford, Ont., and Montreal, P.Q., and now owns and operates



A prize for anybody to be proud of.

mills at Frankford, Ont., Campbellford Ont., and Montreal, P.Q., together with a Groundwood Pulp Mill at Frankford, Ont. Head Office of the Company is at 2 Seigneurs Street, Montreal, P. Q.

Dried Boards in the Sun.

The Northumberland Paper & Electric Company Limited at Campbellford was one of the first board mills in Canada, and dates back to the days when the board was made on wet machines, the sheets then being spread out in the field and dried by the sun. In those days should the weather man decide to send rain, all the help was immediately rushed out of the mill to assist in gathering in the sheets of board under shelter until the rain subsided. This mill has been improved from time to time until now it is one of the most modern and best equipped board mills in Canada, having a capacity of 35 tons of board per day. It was entirely re-built and modernized in 1917 after a serious fire which totally destroyed the old structures. The product of this mill has always been highly considered and at an exhibition held in Toronto in 1886, more than 35 years ago, had the distinction of being awarded a bronze medal for its excellent board exhibit.

The Frankford Mill was formerly owned by the Trent River Paper Company, which Company in 1916 sold out its business to the Canada Boxboard Company Limited. This mill has been greatly improved, and enlarged, and is now equipped to turn out daily about 50 tons of all grades of paperboards. It is also equipped with an up-to-date pasting machine for the manufacture of Container Board, the demand for which is rapidly increasing. During the year 1920 the Company completed a most modern Pulp Mill at Frankford with a daily capacity of 20 tons of Groundwood Pulp. This



Groundwood pulp mill of the Canadian Paperboard Co., at Frankford.

mill is capable of supplying the Company with sufficient groundwood for use in all its board mills. Provisions have been made so that it can be greatly enlarged and its output doubled at such time as the future demands warrant such extension.

The Montreal mill was originally started in 1914 by the Montreal Boxboard Company Limited and was taken



Plant of the Canadian Paperboard Co., Campbelford, Ont.

over in 1916 by the Canada Boxboard Company Limited. Extensive improvements have been made in this mill and at the present time it has a capacity of over 40 tons of board per day. This mill is specially equipped to make all kinds of board specialties including White Patent Coated Board.

The aim and object of Canadian Paperboard Company Limited is to satisfy its many customers and the Company spares no effort to turn out a superior quality of board. The success with which their efforts have been appreciated is evidenced by the fact that more than 25 per cent. of the total quantity of board manufactured in Canada is produced in this Company's mills.

The Company's Officers.

President, John G. C. Kerry; Vice-President, J. R. Walker; General Manager, David F. Robertson; Secretary-Treasurer, Chas. E. Whitten.

Mr. J. A. O'Brien of M. J. O'Brien Limited, Ottawa, and Honourable E. D. Smith of Winona are also Directors of the Company.

FARREL ROLLS USED FOR TWO GENERATIONS.

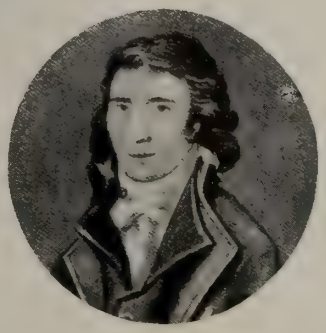
Farrel Foundry & Machine Co., established 1848 have all facilities at Ansonia Conn. for handling pulp and paper makers' orders for the following items: rolls, calenders and roll grinders. For finishing chilled iron rolls they have a shop devoted to this purpose alone of 63,500 square feet of floor space. In this shop are a large number of various machines used in this work, roughing and finishing lathes and a great number of roll grinders both for straight work and for putting a crown on the chilled rolls. These roll grinders are the same which they sell on the market and are applicable for any rolls.

These roll grinders are made in the machine shop and erected by men who have been doing this line of work for a great number of years and before shipment are closely inspected by the roll department who use the same machines in the roll shop.

Patterns for roll grinders and the many other lines of machinery which they build are kept in a pattern storehouse which has an area of 81,000 square feet. This department covers 13 acres.

In the roll department there are lathes, grinders and boring lathes for handling rolls up to 48'' in diameter and 230'' face. In the machine shop there is all the necessary equipment of a machine shop for heavy machinery. The largest planer is 10' x 26' which means that a casting 10' x 10' x 26' can be handled.

There are in the foundry four 30 ton cranes, normal quite a few 30 ton castings are handled. They also have handled in the past a number of 40 ton castings, as the 32'' x 226'' bottom rolls which were built for several calender stacks weigh, in the rough, about 40 tons.



LOUIS ROBERT,
Inventor of the paper machine.

Farrel Foundry and Machine Co., have a branch plant at Buffalo, N. Y. This Buffalo plant has in the machine shop and roll departments together about 3-4 the capacity of the Ansonia plant.

The officials of the Farrel Foundry and Machine Co., are: Roll Department, Charles F. Bliss, President; Machinery Department, Franklin Farrel, Jr., 1st Vice-President; Foundry Department, Walter Perry, 2nd Vice-President; Engineering Department, D. R. Bowen, Chief Engineer. Those best known in the Canadian Pulp and Paper field are Mr. Bliss, Mr. N. W. Pickering, Mr. N. P. Knight and Mr. A.G. Kessler General Manager of the Buffalo plant.

In 1914 an erecting shop which doubled the capacity of the machine shop, and in 1917 an addition to the roll department which increased the capacity of that department by 50 p.c. were made. There is also a special branch of this department which does nothing but engineering work on the chilled rolls. Last year 1300 men were employed by Farrel Foundry and Machine Co.



The picturesque situation of the Canadian Paperboard Co., at Frankford, Ont.

Remarkable Developments In 1921

In spite of all that has been truly said of the unfortunate and extensive business depression, which, being world-wide, has naturally affected the Dominion, the past year has seen some of the most remarkable developments in the history of pulp and paper making. In these respects, the Canadian Pulp and Paper Industry, with the cooperation of Canadian, British, and American machinery builders, has set a number of world's records. During the past year Canadian mills have installed both the two widest and the two fastest paper machines in the world, and what is probably also the widest Harper fourdrinier. Canadian makers built the last three. Canada, furthermore, leads the world in the number of machines operated by sectional electric drives, with five news machines, one writing and one tissue machine so driven, and four electric driven machines erecting. The year has also seen a number of new groundwood mills and several plant extensions. Two features of this development are, the prominence of the magazine grinder and the establishment of the 4-pocket, hand-fed grinder. In this connection, a new type of magazine grinder developed at a Canadian machinery plant is now in operation.

Some of the developments during the interval since the last International Number of the Pulp and Paper Magazine have been described in regular issues. Some of the others will now be referred to, and as extensively as data is available.

Laurentide Attains the Speed Goal.

The first of these accomplishments to be attained was the installation by the Laurentide Company at Grand'Mere, Que., of two 166 inch newsprint machines, built by the Dominion Engineering Works at Lachine, Que., and equipped with the Harland patent interlock sectional electric drive. They were built and erected in record time and with exceptional freedom from delay, were brought up to speed within two months of erection —a most creditable performance, considering the many unknown factors in the proposition. The result is a lasting monument to the courage and foresight of the Laurentide Company and to the ability of the builders. One of these machines has made good paper at 1,047 feet per minute; both run day after day at 997-1010 feet with scarcely a break, turning out, together, more than 150 tons of standard news every 24 hours.

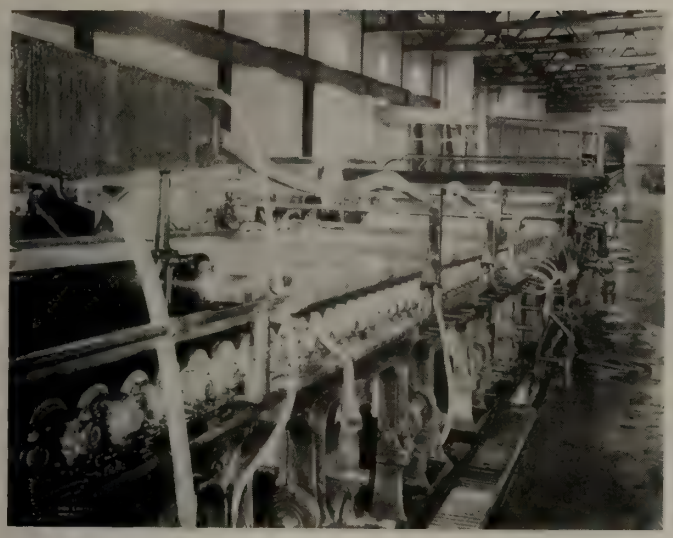
The new machines are housed in the finest machine room that could be imagined. The quietness, cleanliness, ventilation and illumination are particularly noticeable features.

In order to provide pulp for these machines, an extension to the groundwood department was necessary and a number of motor driven magazine grinders with screens, pumps, etc., were installed. Additional electric power was also provided for.

Some of the features of the new machines will now be given.



The fastest newsprint machines in the world. The Laurentide Company at Grand'Mere has two of these monsters, each 166 in. wide making newsprint regularly at more than 1000 feet per minute.



View showing ball-bearings on table rolls, sectional frame, and enclosure for dryers on new Laurentide machines.

Some Features of the Laurentide Machines.

Not long ago, it was thought that paper machines could be built only by firms with considerable experience in this highly specialized industry. But that such a view was false, has been clearly demonstrated by the achievement of the Dominion Engineering Works under the able leadership of Mr. George D. Kilberry. This Company with a new organization, and in a plant not previously used for this class of work, stepped straight into the front rank of high speed paper machine builders by virtue of two 166 inch fast news machines constructed for the Laurentide Company at Grand'Mere, Que.

No little credit attaches itself to the Laurentide Company for its broadness of vision in thus affording an untried Canadian company an opportunity of proving that this Country will not take second place even in paper machine building. And the confidence of the Laurentide directors has been amply justified, for the new machines were completely erected without the use of shims at any point. Moreover these machines are turning out newsprint steadily and successfully at the rate of over 1,000 feet per minute, and it is expected that this speed will be raised to 1,200 feet per minute. A notable feature of the achievement is that the machines were designed, built, erected, and in operation in a little over a year, all told.

Some unique features of construction will be noted in the following brief description:

The table is non shaking, and the wire 166'' wide by 103.5 ft. long with a downward slope of 30'' from breast roll to couch roll. The usual Fourdrinier rail construction is eliminated, and the breast, table, and wire carrying rolls are supported on a rigid cast iron frame which is built in four sections. Each section is strongly braced across the machine and forms a unit in itself. The design of each section is such that it may be moved out to the centre aisle of the machine room on special trucks equipped with SKF ball bearings, without disturbing the table or other rolls. All the table rolls, wire rolls, guide rolls, and breast roll are mounted on SKF ball bearings with specially designed housings. This considerably decreases the pull on the wire, thus lengthening its life and making possible a much higher speed than could otherwise be obtained.

The Millspaugh patent suction type couch roll is 30 in. in diameter, making it the largest roll of this type ever constructed. Each machine has four sets of presses; the first press being of the Millspaugh suction press type and the other three, standard with polished granite top rolls, and rubber covered bottom rolls. The felt arrangement on the presses is very simple, each felt having only one loop. This is accomplished by allowing the felts to pass down through the pit into the basement where the automatic take-ups are located. The presses are all forward presses, that is, the paper passes straight down through them to the dryers.

The dryer section consists of a small leading dryer 36 in. in diameter, and forty 72 in. main dryer cylinders, arranged in two tiers. The bottom dryers are carried directly on the machine base plates. Felt dryers are dispensed with as the felts are fully exposed to the drying effect of the hot air. One top and one bottom felt is used, each being equipped with two long range automatic take-ups, two hand guides, and two automatic guides. The calender is of the usual design with bottom roll 30'' in diameter and all upper rolls 16'' in diameter.

From couch roll to calender the paper is handled and passed through automatically.From the couch roll and through the presses the paper is passed by means of compressed air jets. Through the dryers, a ''Sheahan'' patented rope carrier is used. This consists of a pair of endless ropes, running side by side on sheaves bolted to the front end of the dryer shells and almost equal in diameter. The ropes separate at the last top dryer thus releasing the paper tail, and return over suitable sheaves to the first dryer where they again unite, forming a bight to receive the paper tail from the last press, when it is necessary to thread it through. A novel arrangement is used to pass the paper from the dryers to the calender. A series of air jets below the paper, which is



A ball bearing housing at the wet end of one of the new Laurentide machines. The extensive use of ball bearings is an important factor in successful running at high speed.

about 10'' or 12'' wide, from the doctor on the last top dryer to the desired nip on the calender by means of guiding guards, so located that the sheet is blown between them to the nip.Should a break occur between dryers and calender a second ingenious device is used to pass the full width of sheet through the calenders. Its action is similar to that of the squirt used for cutting the sheet off the wet end, with the difference that a needle coming in contact with the dryer is used in place of the jet of water. This arrangement makes the passing of paper at the stack a very simple matter, whereas otherwise considerable skill would be reqnired.

Both machines are driven by the Harland Engineering Company's electric drive with patented speed inter-lock and individual motors on each unit. The mechanical inter-lock is completely equipped with SKF ball bearings.

Neat in appearance and installed in a well built and nicely lighted machine room, these machines form a lasting record to Canadian engineering ability, of which both the Laurentide Company and the Dominion Engineering works may well be proud. A speed of 1,000 feet per minute has long been the aim of paper machinery builders and the honor of attaining it goes to a Canadian firm and a Canadian concern with Canadian workmen as both these machines are running regularly at better than this speed.

Abitibi as the Widest Machines.

The latter half of the year 1920 and the year 1921 was a period of great expansion at the mills of the Abitibi Power & Paper Company at Iroquois Falls.

During this time the addition to the mill at Iroquois Falls, Ont., was completed. Three new paper machines were installed, raising the capacity of the paper mill from 250 tons a day to 500 tons a day. Three additional beaters and fourteen deckers were installed to look after the needs of the new machines. The building for the new wrapper machine was completed, and the machine is now being installed. It will be running early in the new year, and will have a capacity of 35 tons of wrapping paper daily.

Another big feature of the year's development was the completion of the power plant at Twin Falls and the installation of four large generators, with a capacity of 6,000 horse power each. This gives 24,000 available electric horse power, with space to install another generator of the same size when required.

Other new installations during this period were 21 new grinders in the Groundwood Mill, two transformers houses in connection with the bringing in of the current from Twin Falls, a new Stores Department, a woodworking shop, additional savealls and groundwood screens, and wet room pumps.

In addition to this new work there was a large amount of improvement in the old mill, which added considerably to the convenience of operation and efficiency.



View from the wet end of one of the huge 232 in. Walmsley machines at the Abitibi Power and Paper Co.

Paper Capacity Doubled.

The great event of the year for the Company was the erection and start up of the three new paper machines, which combined turn out 250 tons of newsprint a day, doubling the capacity of the mill, and making a total production of newsprint of 500 tons daily.

Number 5 machine was built and erected by Pusey-Jones Company, a record being made in time of erection. It took just twenty-eight days from the time erection was started until the machine was first turned over.

This machine increases the output of the Company by sixty tons a day. The feature of the machine is that it is one of the paper machines in this country equipped with sectional electric drives, in fact the first to be driven by the individual sectionalized motor drive of the Westinghouse Electric and Manufacturing Co. The maximum speed is 800 ft. per minute.

The fourdrinier part has a wire 158''wide and 80 ft. long. The press part has three presses, designed for 65 ft. felts. There are thirty 5 ft. dryers, a 10 roll calender, a uniform speed reel, geared type unwinder and two drum, high speed winder.

The drive will be described elsewhere in this issue.

Biggest Machines in the World.

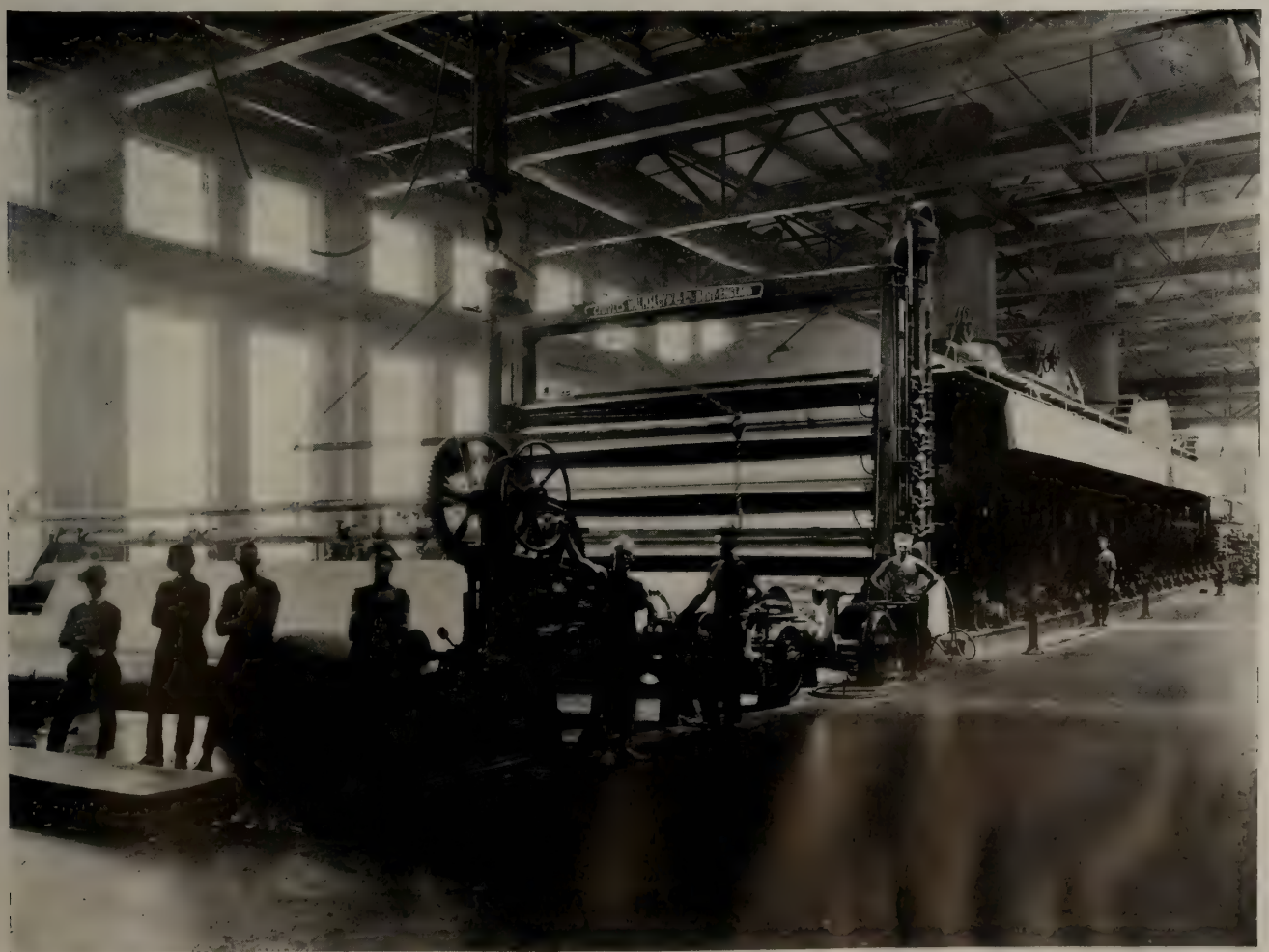
Machines No. 6 and No. 7 are the two largest paper machines in the world. They were built by Chas. Walmsley & Co., Limited, of Bury, Lancashire, England. The wire width is 80 ft. long and 232'' making a sheet 221'' in width. Number 6 is driven by a 500 horse power electric motor, and No. 7 is driven by a 500 horse power Belliss and Morcom Vertical Engine manufactured at Birmingham, England. The power is transmitted by belt and rope trains.

They are twin machines, one right and one left hand and are truly majestic. These three machines are housed in the same machine room.

The shake supports at the breast roll are made on an improved principle specially designed for high speed running machines and arranged to give a parallel shake (if required) without any loss of motion and to felt the fibres equally on the wire.

The breast roll is of special design and is made of a hard brass shell, perfectly balanced, having wrought gudgeon journals, which work in improved phosphor bronze bearings. The couch rolls are made from a hard cast brass shell, special design, mounted on strong cast iron rollers with mild steel centres. Owing to the excessive width of these machines, considerable thought has been given to the design. The couch framing is so arranged that a wire can be put on with very little labor, the rolls being carried with geared swinging arms for lifting each end of the top roll, and also arranged to give a variation of couching pressure.

There are eight vacuum boxes built entirely of brass with expanding heads and maple covers. There are



The dry end of one of the largest machines in the world at the Abitibi Power and Paper Company's Plant, Iroquois Falls, Ont.



Mr. F. H. ANSON,
President, Abitibi Power & Paper Co.

three presses and all the rolls are made of special design and so constructed as to eliminate deflection. The top press roll journals are carried in the latest type radial arms with screws, wheels, etc., for adjusting same, and also arranged to give a variation of couch.

There are 30 cast iron dryers rollers 5' diameter, here again a great amount of study was given in order to eliminate deflection. They are cast from a special mixture of metal, which gives a tensile strength of from 10 to 15 tons per square inch. All drying cylinders are fitted with special water lifter. The framing is of good strong section, of special design.

The cylinder pedestals are fitted with bored and turned phosphor bronze steps and made self-lubricating with positive rings.

The all-steel dry felt rolls are machined all over the body and ends and are also perfectly balanced.

The finishing calender is fitted with 10 rolls, the bottom roll being 32 in. diameter, being carried in swiveled pedestals with anti-friction metal self-oiling bearings. The upper rolls are carried in cast iron self oiling sliding blocks, with phosphor bronze bearings.All these bearings are made self-lubricating. It is also equipped with suitable hydraulic lifts. The gearing is of the Lloyd & Hutchison patent drive, on the basement principle, working without gear wheels or friction clutches. This drive is undoubtedly the finest of its kind.

The machines started up with the least possible trouble; a typical operating efficiency record at hand reads: Making paper slightly under 32 lbs. and allowing half an hour a day for washing, the operating efficiencies were, for 9 consecutive days in September and October, as follows: 93.0 p.c.; 90.3 p.c.; 95.0 p.c.; 91.0 p.c.; 96.3 p.c.; 91.4 p.c.; 94.0 p.c.; 93.8 p.c.; 96.4 p.c. The manufacturer said, in a letter to the Editor, "We have no hesitation in saying that with such an organization as the one at Abitibi Co., Iroquois Falls, so ably governed by Mr. R. A. McInnis, we are perfectly certain that before very long greater results will be achieved."

The machines when running at 700 ft. per minute will produce 85 tons per day; in fact, actual figures show that, when running at 587 ft. per minute, they produced 75 and 76 tons respectively. It may be added that work on designing these machines was begun about six years ago.

In order to look after the wants of the new machine room two Noble & Wood beaters were installed with a battery of 14 Sherbrooke deckers.

The Wet Room equipment was also increased by five Sherbrooke centrifugal groundwood screens and five Sherbrooke savealls, and the necessary pumping capacity to handle the stock.

Stock pumps for the delivery of stock to the deckers in the new mill were installed; white water pumps for shower water to the screens, and sliver pumps to handle rejected stock, to the refining system.

Twin Falls Power House.

One of the most important events in connection with the development of the Abitibi Power & Paper Company was the construction of the demand power house at Twin Falls. It was a work of very great magnitude, and was carried through successfully in spite of unforeseen difficulties, until on March 21st, 1921 construction was so far completed that the installation of the first generator was begun. By June 23 this generator was in running order, and the juice was turned on for use in the mill at Iroquois Falls. The second generator was put in commission on July 2, and the third and fourth on July 11th and 25th.

In addition to being an absolutely up-to-date and complete power house, considerable attention was given to architecture with the result that the power house at Twin is one of the handsomest industrial buildings in the country.

In connection with the bringing of the Twin Falls power into the plant, two sub-stations were erected. Sub-station No. 1 contains three 1,750 K.V.A. transformers supplying power to the new Lyn motor power house driving five 1,250 K.V.A. Lyn motors directly connected to grinder lines of three stones each.

Sub-station No. 2 contains three 5,000 K.V.A. transformers supplying power for the pulp and paper mill.



Mr. R. A. McINNIS,
Mill Manager, Abitibi Power & Paper Co.

Twenty-one New Grinders.

In the old mill there were ten rows of three grinders each—thirty stones in all. As soon as the new building was completed twenty-one additional machines were put in, and the mill now has seventeen sets of three stones each, or fifty-one stones in all. This gives a total capacity of groundwood of about 450 tons.

In connection with the installation of the new grinders, a record piece of work was done. Number 4 generator of the old mill was taken down and moved into the new extension in one day, to provide room for an extra row of grinders in the old mill. The generator is being used as a motor in the extension. The work of taking down, moving and setting up No. 4 generator looked like a two-day job, but after close figuring by the engineers and foremen, it was decided that it could be done on a Sunday by starting early and working straight through till the job was completed. The men started at eight o'clock Sunday morning when the mill shut down for the week end, and by six o'clock before the men came in for the Monday morning start everything was in order to go right ahead.

In the Finishing Room an automatic roll header has been installed, which handles the product from Machines Nos. 5, 6 and 7. The heads are pasted to the wrappers and pressed into positon till firmly stuck, before the roll is up-ended.

Steam Plant Additions.

A considerable addition had to be made to the Steam Plant. Five retort Taylor automatic furnaces were put in and six 478 horse power water tube Babcock and Wilcox boilers.

Three Sturtevant economizers were installed, also Bailey recording boiler meters, a Cope's feed water regulator, and Bayer Soot Blower on each furnace. A complete recording equipment has been devised for the heating balance of the steam plant operation.

New Mill Stores.

The new Mill Stores contains three floors and basement, all floors and walls being of concrete and the racks for materials are of the adjustable iron kind which permit of easy classification of the multitude of small stores which it is necessary to carry for repairs.

Each floor is 126 ft. by 155 ft. The Stores Department Office is in one corner of the main floor of the stores building, and the three floors have elevator accommodation which permits of the movement of articles called for with the least loss of time. The receiving entry is at the rear of the building and is arranged both for wagon and car delivery.

In connection with the Stores a new grinder stone store-room has been built, where a year's supply of stones can be kept. The moisture and temperature are under control, so that the stones will be thoroughly matured before they are put on the grinders.

Wood Working Shop.

Up till 1920 there had been no wood-working shop and the work was done under certain difficulties. With the doubled capacity of the mill and the consequent increase in this class of work, it was thought advisable to install a properly equipped wood-working shop. This room is 163 ft. by 51 ft. and is situated next to the machine repair shop. The entire equipment is not yet installed, but it will shortly be complete with the latest wood-working machinery, so that this part of the maintenance work can be done with the greatest speed and efficiency.

Additions to Old Mill.

The above covers most of the installation in the new mill. In addition, however, there was considerable addition and re-arrangement of equipment in the old mill, of which the following items constitute the principal additions:

Increase in coolng surface for relief liquor and gas in Sulphite Mill.

Installation of turpentine separating equipment in digester relief coolers.

Installation of six Toledo dial scales in the Finishing Room.

Two additional Howard ball mill refiners.

One additional knotter.

Three Sherbrooke centrifugal sulphite screens.

New acid tank and complete absorption piping.

Acetylene gas generator for welding.

Water tight stiffened wooden apron at draft tubes.

Twenty-inch incline belt coal conveyor from crushers to bunkers.



The new paper machine of the Howard Smith Paper Mills at Beauharnois, Que.

Howard Smith Mills Moved Ahead.

In line with the progressive spirit which has characterized the pulp and paper industry, the Howard Smith Paper Mills, Limited, have carried out extensive improvements at their mills at Beauharnois, Crabtree Mills, and Cornwall. This policy was partly inspired by a desire to secure the most economical production, and partly with a view to making other lines, one or two of which had not previously been manufactured in Canada. This is notably so in the case of Blotting Paper, which has met with a very gratifying demand. The extensions already made and in course of construction enormously increase the manufacturing facilities of the Company, and of course place the Company in a better position to handle the various products. In some instances, parts of the plant have been scrapped, and new equipment installed.

At Beauharnois, where bonds, ledgers and writings are made, a new machine for the manufacture of Loft-dried Papers has been installed, together with new beating and finishing machinery. The latter is located in a new finishing room, to which part of the old machinery has been removed. New lofts have also been constructed. The finishing room was completed in June, 1920. The machine, supplied by the Dominion Engineering Company, Limited, Lachine, has a maximum trim of 73½ inches and a maximum production of seven tons per day of the highest quality paper.

An additional machine has also been installed at Crabtree Mills, where the Company turn out sulphite bonds and book papers. This machine has a maximum trim of 80 inches, with a maximum production of from 15 to 18 tons, according to the grade made. It is equipped with the Harland electrical sectional drive, of English manufacture, and supplied by the Harland Engineering Company, Montreal. The D. C. current is generated by a Bellis and Morcom engine, direct connected to a generator, of 90 Kilowatts capacity. The motors consist of three of 30 HP each, and three of 15 HP each. The extensions at the mill include a new raw material storage warehouse, of reinforced concrete, situated about 100 feet from the mill, but connected by means of an enclosed passageway.

The boiler capacity of the mill has been increased by installing a 300 H.P. Babcock and Wilcox water tube boiler, and by extending the boiler house. This was rendered necessary owing to the additional power required for the new machine.



The comfortable and well equipped club house at Crabtree Mills. Membership in the Beaver S Club is much prized.

The Company are starting on a small new groundwood mill, which will produce high grade mechanical pulp, for the Company's own use.

In order to increase the precautions against fire, an extra water tower 60 feet high has been erected, and the fire sprinkler system extended.



Social Room, Beaver S Club, Crabtree Mills.

The Company have for a long time adopted the policy of providing house accommodation for the employees, and also of providing a boarding house. The houses are let at a nominal rent. The policy has been found, both here and elsewhere, of great value in retaining help. Large companies are, as a rule, desirous of keeping their trained employees, and satisfactory housing conditions have proved to be an important factor in this connection.

The most extensive improvements have been carried out at Cornwall, Ont., where the Company secured control of the mill of the Toronto Paper Manufacturing Company. This division of the Company's operations manufactures sulphite, bonds, book papers, blotting, cover papers and Bristol boards. The old sulphite mill has been scrapped, and an entirely new plant constructed. This has a capacity of 65 tons of bleached sulphite per day. It is constructed of steel, reinforced concrete, and brick, and is as fireproof as it is possible to make a building. It is a first class structure in every respect — and is equipped with the latest machinery and accessories. An electrolytic bleach plant is being installed in connection with the mill. The process has proved to be economical by reason of the by-products, for which there is a good market. The plant is from designs by the Samuel M. Green Company, Springfield, Mass., with Nelson electrolytic cells by the Warner Chemical Company, Carteret, N.J. The latter concern sublet a part of the contract to Canadian firms.

A new boiler plant has been completed. Formerly steam was supplied from three boiler houses, scattered over the property. These have been discarded, and a first class boiler house, of steel, brick and concrete, erected, thus effecting a considerable saving in operating cost. Six Goldie & McCullough water tube boilers are installed, their total normal rated capacity being 1878 H.P.; with a permissible full load of 3,000 H.P. They are fitted with Coxe Automatic chain grate stokers, Jeffrey coal conveyors, and Greene economizers. The stack, 200 ft. high, was constructed by the Canadian Custodis Company.

These extensions necessitated additional filter capacity and when the program of improvements was laid out the Norwood Engineering Company was instructed to construct new filters.

The Company take no chances with regard to fire, and consequently additional precautions have been taken. Besides laying new pumps and hydrants, and extending the sprinklers, three towers, with monitor nozzles, are being erected at points around the wood pile.



Bowling alleys at the Beaver S Club.

Some changes have also been made in the paper machines. No. 4 machine has been converted from the Fourdrinier to the cylinder type. This was done by substituting three cylinder moulds, with stuff chests, pumps, etc., for the fourdrinier parts, with the object of making Bristol boards. An additional cylinder mould, and extra dryers will be added in the near future. The trim of the machine is 72 inches, and the capacity twelve tons. No. 2 machine is being re-built, increasing the capacity from twelve to twenty tons per day.

Spanish River Pulp and Paper Mills.

During the past year the Spanish River Pulp and Paper Mills completed the extensions to their plants at Sault Ste. Marie, Espanola and Sturgeon Falls, Ont., which had been in progress for some time. These developments involved a great deal of expense, but their accomplishment has put the Company in excellent physical condition for efficient operation and gives this concern the largest total production of any Canadian company. The most prominent feature of the plant development was the installation of a Pusey & Jones paper machine, equipped with a General Electric sectionalized electric drive, at the Sturgeon Falls Mill.

This machine has a Fourdrinier part for a wire 152 inches wide by 80 feet long. There are three wet presses, using 65 foot felts. In the dryer part are 32 dryers 60 inches in diameter. At the dry end are—a 10 roll calender stock, uniform speed reel, geared type of unwinder, and a two drum, high speed winder. The maximum speed is 800 feet per minute.

The company now has 14 paper machines, as follows:

Espanola: two 120-inch, and four 164-inch Fourdrinier news machines.

Sault Ste. Marie: two 156-inch, one 186-inch and one 198-inch Fourdriniers, and one 106-inch board machine.

Sturgeon Falls; two 120-inch and one 152-inch Fourdrinier machines.

Interlake Tissue Extends.

The fact that Canada is not entirely a newsprint country is emphasized by the recent addition of a new machine by the Interlake Tissue Mills, at Merritton, Ont. It is very encouraging to see other lines in such demand as to warrant developments of this kind—Canada gets double credit because the new machine was built in Canada by the Dominion Engineering Works, and is the largest Harper machine ever installed. Furthermore, it is driven by a Harland sectionalized electric drive, which makes it unique in this respect. The machine is 148 inches wide, but in most other respects is of the usual type. Although the machine has been running with great satisfaction, both as to speed and quality and quantity of output, it is understood that, in view of the class of papers the machine is to be used for, the Company has decided to turn the wire part about and convert is into a straight Fourdrinier with a special felt attachment.

At Shawinigan Falls.

The first change to note at Shawinigan Falls, Que. is that the Belgo Canadian Co. is now the Belgian Industrial Co. Ltd. The same management is in charge. During the year an extension was built to the Groundwood Mill. In this extension there are installed and in operation four magazine grinders; there is room provided in the building for one additional unit giving space for six magazine grinders in all with an ultimate capacity of 120 tons pulp per day. The present production of the units in operation is approximately 80 tons per 24 hours.

In conjunction with this grinder room extension there was also built a transformer house and switch room where the necessary electrical apparatus has been installed to provide current for operating the magazine grinders; the current is received from the Shawinigan Water and Power Co. at 60,000 volts, 60 cycle and is then transformed to 2,200 and 550 volts respectively for use on motors throughout the plant.

The Company also constructed a coal storage consisting of an elevated trestle with concrete tunnel beneath the coal storage. This storage provides room up to 30,000 tons of coal and the arrangement is such that cars can be unloaded rapidly by merely dumping from the trestle. Numerous other improvements were carried out but principally refer to operating control and efficiency such as the slush pulp mixing system in the paper mill.



A raft of pulpwood for the Port Arthur Pulp & Paper Co.

The Kraft Mills.

The Dryden Pulp and Paper Co. is no more; it is now the Dryden Paper Co. Ltd. When the change was made, in October 1920, the company planned to provide the necessary construction and equipment for more power, a groundwood mill,and the production of pulp board. Then came the slump and the question of the U. S. tariff on boards. Instead of making these extensions, attention and money was put on extensions and improvements to the sulphate pulp and paper plant, with the result that production has been increased 50 per cent, and costs of production greatly reduced.

The case of the Brompton Pulp and Paper Co. is somewhat similar. This company has achieved a marked increase in production of kraft pulp without installing any new equipment. A new groundwood mill has been put in operation which greatly strengthens the company's position as producers of newsprint and boards.

The only new kraft pulp mill is that of Clarke Bros. at Bear River, N.S. This is a development of the lumber business of the firm and makes use of their location on tide water, adjacent to supplies of timber. It is a modern plant in every way, from wood preparing department to the steam plant with its oil-burning boilers. There are 3 digesters, with a capacity of 50 tons daily. In connection with the pulp mill, the Company intends to operate a conversion plant at St. John for the manufacture of box boards.

In kraft paper, we find an increase in the capacity of the Wayagamack Co. through the installation of new Bentley & Jackson paper machines, which brings the production up to 200 tons per day and makes the mill the largest plant in the world exclusively for the manufacture of kraft pulp and paper.

New Mills.

The depression of the past year has had a marked effect in retarding construction of the new mills for which plans have been made. The largest development that has gone ahead is the plant of the St. Maurice Lumber Co. (subsidiary of the International Paper Co.) at Three Rivers, Que. The plant has an excellent location, with both railway and deep water shipping facilities. The sulphite mill has been in operation for some time, turning out about 55 tons of pulp daily, which is shipped to the company's mills in New York State, until the new paper mill is ready. The wood barking plant, with three drums, furnished by the Canadian Ingersoll Rand Co. is of the most modern type. The boiler plant uses oil fuel, which is stored in a huge subterranean concrete tank holding 160,000 barrels.

The groundwood plant is practically complete as is the paper mill, in which are located the four Bagley and Sewall 164'' high speed news machines. These machines are equipped with the General Electric Company's sectionalized electric drive.

This mill was described in the Pulp and Paper Magazine June, 1921.

Several new mechanical pulp mills have been constructed. The largest is that of the Fort William Paper Co., which is described elsewhere in this issue.

At Nipigon, Ont., about 60 miles from Port Arthur, is the new groundwood mill of the Nipigon Fibre and Paper Mills, Ltd. with a capacity of 70 tons of pulp daily.

The Kaministiqua Pulp and Paper Co. at Port Arthur also began operating during the year a groundwood pulp mill with a capacity of 35 tons daily.

The buildings for a mill to have a capacity of about 30 tons of groundwood has been erected near Haileybury, Ont. by the Temiskaming Pulp and Paper Co.

The mill proposed by the Quebec Lumber Company has not yet been built and apparently nothing tangible has been done toward building the Dansereau mill at Sorel, P.Q.

A two machine news mill at Three Rivers, for the Three Rivers Pulp and Paper Co. is hanging fire, with prospects of a start on the construction when the building season opens.

It is generally understood that work is to go ahead on at least the sulphite mill of the Metabetchuan Pulp & Paper Co., near Lake St. John, Quebec.

Nothing has been announced recently with regard to the Manouan Pulp and Paper Co., which is credited with having an excellent mill and power site on the Transcontinental Railway near the confluence of the Manouan and St. Maurice rivers.

Work was begun on the sulphite plant of the Spruce Falls Pulp and Paper Co. at Kapuskasing, Ont., but this was interrupted by the depression in business last summer.

Two large propositions are in sight for British Columbia. It is understood that the Prince Rupert Pulp and Paper Co. has plans perfected and is ready to proceed at once with their sulphite department as soon as improved business conditions warrant the step, to be followed with a groundwood plant and news mill, involving, of course, a rather extensive hydro-electric development.

Prince George seems the probable site of the other mill and the principals, among whom are Mr. Angus McLean of the Bathurst Lumber Co. and Mr. F. P. Jones of the Canada Cement Co., are now endeavouring to arrive at an agreement with the provincial government relative to assurances of sufficient timber to warrant an investment estimated at something like four million dollars.

At Cornwall, Ont., a plant has been acquired, and put in operation by the Cornwall Pulp & Paper Co. and machinery installed for the production of mechanical pulp.

The acquisition of power rights and timber limits in the English River district by the Backus interest puts them under obligation to erect a pulp and paper mill (probably news) at Kenora, Ont. Nothing active has yet been done.

About the same situation exists with regard to J. D. MacArthur and others in connection with the Winnipeg Pulp and Paper Co.

Winnipeg is also the location of the Red River Paper Co., organized to make boards and gray wrappings from waste paper.

The biggest development that is likely to occur in next few years is probably the new town of Saguenay with the six machine mill planned by Price Brothers & Co. This huge project is suspended for the time being, but it is confidently expected that the work will eventually proceed.

Announcement has been made that the Provincial Paper Mills will add a paper mill in the near future to their excellent pulp mill at Port Arthur, Ont.

Altogether there is something like fifty million dollars worth of new mills that should be underway within, we should say, the next two years. Besides this probably ten millions will be spent in extensions and improvements in Canada.

Educational Work in the Pulp & Paper Industry

There are few, if any, industries on this continent entitled to greater praise for their educational efforts than is due to the Pulp and Paper Industry. Several years ago it became evident that the demand for night schools and other educational opportunities in pulp and paper centres could not be satisfactorily met without having an authentic text book on which to base the work. The organizations of the technical men in the industry in Canada and the United States appointed a Joint Executive Committee which immediately drew up plans for the preparation of a suitable text and estimated what appeared to be an adequate amount for defraying the cost of preparing the manuscript. Experts in each of the principal phases of the industry were engaged to write the section dealing with their particular department and the necessary editorial staff was engaged for putting the manuscripts in uniform style, in language properly prepared for the printer, and re-written where necessary in order to present the information in the clearest po sible manner, which is a vital factor in the success of a text book, particularly one intended for correspondence instruction.

The whole scheme was something without precedent and on this account, and because the number of necessary illustrations and the work required to prepare them properly was somewhat under-estimated, the original fund of $30,000 which was quite promptly forthcoming from the industry, proved somewhat insufficient. This discrepancy was partly due also to the very marked rise in all values since the preparation of the books was begun. Additional funds are now being raised to complete the work.

Volume 1 was finished in January last and Volume 2 appeared in the spring. Volume 3 is now practically complete and will be available very early in the new year. A large amount of work has been done on Volume 4 and considerable has been accomplished in the preparation of Volume 5. A brief description of the contents will be of interest to all of those connected in any way with the industry and a few words will be added in regard to the manner in which several communities are making use of this text in their educational work.

What the Books Contain.

Volume 1 contains the following sections: Arithmetic, Mathematical Applications, How to Read Drawings, and Elementary Physics. Volume 2 deals with Mechanics and Hydraulics, Elementary Electricity and Elements of Chemistry. It will be seen that these volumes cover the requirements in fundamental mathematics and science on which any successful development of the course of instruction in pulp and paper manufacturing processes must be based. The reason for beginning the series with these subjects is that the committee set out to prepare a complete course of instruction and appreciate the absolute necessity of a proper understanding of these subjects before a study of manufacturing operations can be successfully undertaken. One of the chief handicaps of the rank and file of pulp and paper mill workers is that they have not had a satisfactory grounding in these fundamental subjects, and, therefore, are not in a position to grasp and develop ideas which would advance the industry and improve their own standing and earning power. These subjects have been treated very clearly and as comprehensively as necessary to give the required foundation for further study. Illustrations and examples, wherever possible, are based on actual mill experience. This immediately connects up these subjects with the mill and makes the study not only more valuable, but more interesting.

The Manufacture of Pulp is taken up in Volume 3 and is covered in a more comprehensive manner than has yet been undertaken. An important feature of the volumes is the wealth and the excellence of the illustrations. This is particularly shown in the first section, which deals with the Properties of Pulpwoods, a subject which, heretofore, has not been given the attention it deserves in books written for pulp makers and pulp users. It is particularly necessary for men



J. N. STEPHENSON
Editor of the Industry's text books.

who would understand manufacturing processes to have a pretty clear notion of the character of the principal raw material. In this section both the physical structure and chemical properties of wood are carefully explained. Another feature of this volume is the section on Wood Preparation. This takes up the various methods of barking, chipping, and screening of pulpwood, and includes information on fire protection and the growth of fungi.

In the other sections on manufacture, the production of mechanical, sulphite, soda, and sulphate pulps is described clearly and with a large number of illustrations of the usual equipment, with full explanation of the operation of each machine. These illustrations are not pictures used for ornament, but carefully prepared line drawings, with parts properly designated. entitled to greater praise for their educational efforts The Treatment of Pulp is a section which has to do with operations common to every kind of pulp, such

There are few, if any, industries on this continent Part one describes the principal types of refiners with their object and their result. Part two covers accepted methods for sampling and testing of pulp for moisture and describes methods for testing purity, cleanliness, strength, bleaching quality, etc. Bleaching of Pulp covers the preparation of bleach solution from bleaching powder and by electrolysis, describes the different types of electrolytic cells and discusses the chemical principles involved and the bleaching operation.

Volumes 4 and 5 take up the Manufacture of Paper and here, as in Volume 3, each section has been written by the person particularly qualified from his training and experience with the subject assigned him. Paper mill operations are assumed to begin with the preparation of rags and such other fibres as receive their initial treatment in the paper mill. The necessary equipment is fully described and the cooking and washing processes explained. The treatment of waste papers has assumed a position of great importance in recent years and the subject is adequately covered in this



Mr. T. L. CROSSLEY,
Chairman, Committee on Education for the Technical Section of the Canadian Pulp and Paper Association and Member of the Joint Executive Committee.

section. The section on Beating and Mixing covers the discussion of the principles, the apparatus, and the processes encountered in the preparation of the material for the paper machines. Furthermore, operations such as Engine Sizing, Coloring, and Loading are treated in separate sections where these important considerations are thoroughly explained.

The section dealing with paper making machines is without doubt the most comprehensive treatment of this subject which has ever been published. The screening of stock is the first matter included and from there the author comes to the explanation of the principles involved in paper making by machine with descriptions of, we believe, every type of paper making machine. Considerable attention is given to the actual operation of the machine, with explanation of the function of each part and including figures on the various factors which influence paper machine efficiency and, of course, including descriptions of the recently developed electric drives.

The manufacture of paper is continued in Volume 5. This volume contains a description of particular merit of the process of making Handmade Paper and with illustrations which cannot possibly be surpassed. This is followed by a discussion of Tub Sizing of paper, both in the form of sheets and in the web. The next section is on Finishing Operations, which includes the handling of paper from the machine to the warehouse and deals with calendars, cutters, etc. There is included a section on Coated and Other Treated Papers, such as vegetable parchment, since in a number of cases these processes are carried on in conjunction with the manufacture of the paper, and the quality of the paper furthermore, is important to their success. The section on the Manufacture of Special Papers, Boards, etc., will contain information with regard to some of the special factors or special conduct of regular mill operation required to produce the desired results. Paper Testing is a subject that deals not only with the methods of testing paper for the more important qualities, but incidentally furnishes considerable information on the characters and constituents of various kinds of paper. A chapter on Mill Organization is planned for in order that a person desiring to become acquainted with the industry can be informed as to the various departments of the mill and their interrelation. This is particularly valuable in giving the novice a knowledge and an appreciation of the extent to which the success of the operations in one department depend upon the care with which members of the other departments carry on their work. Under General Mill Equipment we find treated a number of features which contribute largely to the handling of materials, transmission of power, steam, etc. Provision is being made for a chapter on Water and for a section on Laboratory Practice and the Analysis of (the more important) Raw Materials. This volume concludes with a Dictionary of Papers, Useful Tables, and the like. Certain of the sections in Volume 5 are purposely made somewhat flexible as to scope in order to vary them where necessary in order to keep the size of the volume within the limits planned and provided for by the committee and the publishers.

A feature of the books is that they are not only available as bound volumes but they also have been prepared in the form of study papers containing about 50 pages each, for greater convenience to the man who does not want to risk damage or loss of his bound copy and who may want to slip a study paper in his pocket to study at odd moments and to have handy in attending classes. This feature is especially designed also to facilitate instruction by correspondence.

Organization of Instruction.

At least five paper mill towns in Canada are conducting or planning classes in which these text books will be used, and there is at least one community in the Uited States where the first two volumes are already in use. The method of conducting the work and the manner in which the text books serve the purpose vary with the locality. In Canada books are sold in sets and in several cases the companies are assisting the men in purchasing them on the installment plan. The books can be purchased either bound or in pamphlet form and it is possible for a mill to assist the men in purchasing pamphlets where they desire to own them or to purchase the pamphlets for the mill and as screening, de-watering, pressing, drying, etc. The Refining and Testing of Pulp is a section in two parts.

distribute the appropriate study papers to the men attending the corresponding classes. This practice will doubtless prove helpful, especially at plants where several classes are being conducted simultaneously. It is hardly possible for a man working in the mill to attend more than two classes at the same time, so that the purchase and distribution of the study papers by the mill would relieve the student of having an accumulation of papers which might be lost before his school work had progressed to the point where they would all be required. On the other hand, the pamphlets are punched and can be provided with binders so that a man can equip himself with the whole treatise and take out for immediate use only such parts as his class is covering. The experience of the present winter will provide some interesting and valuable information with regard to the best methods of organization of classes and conducting the educational work.

Sales of the first two volumes are progressing very favorably and there is no doubt but that the excellence of the books and particularly the treatment of the manufacturing processes, will create a demand that will require an early appearance of a second edition. In view of this the committee invites prompt criticism of the work and suggestions for improvement, particularly correction of any error that may possibly have crept into the work.

The distribution of the text is carried on by the Pulp and Paper Magazine, acting for the Canadian Pulp and Paper Association in Canada, and by the Technical Association of the Pulp and Paper Industry, 18 East 41st Street, New York City, for the paper industry in the United States and, in other fields, by the McGraw-Hill Book Company, who are the publishers.

PULP AND PAPER PERSONALITIES.

Mr. George Carruthers.

George Carruthers was born at Avening, Ontario, in the year 1869. He attended public school and worked on his father's farm probably on the part time education plan which he now advocates. George quit the farm and went to Buffalo where he attended Buffalo as apprentice machinist with the E. and B. Homes Machinery Company for three years, then as machinist for one year. By reason of his diligence and study he was made general foreman and held the position for three years. After one and a half years with the Snow Steam Works he became cashier at the Buffalo office of the International Correspondence School for a year and superintendent of I. C. S. Agencies in Canada for fourteen years.

Mr. Carruthers became interested in the pulp and paper industry and founded the Interlake Tissue Mills Limited at Merritton, Ontario, and since then he has been president and general manager of this concern with his head office at 54 to 56 University Ave., Toronto. He is interested in other papermaking propositions and takes a keen interest in educational affairs. He is one of the foremost men in Canada in advancing the cause of educating the blind and is chairman of the Joint International Committee on Education for the pulp and paper industry, which is preparing a set of text books on this subject. Mr. Carruthers is one of the most popular men in the industry.

THE EDITOR'S QUALIFICATIONS.

It has been suggested by several persons connected with the industry that some information be published as to the qualifications of the editor of the text books on the Manufacture of Pulp and Paper for the important work of supervising the preparation of the material to be included in them. The case may be stated briefly as follows:

From the time he was sixteen year of age, which is twenty-three years ago, J. N. Stephenson has been interested in even when not employed by the paper industry. During the first two years after graduating from high school, employment in the Stanley (Electrical) Instrument Co., brought contact with machine-tools, electrical apparatus, and plant management; then came two years experience in the mills of the B. D. Rising Paper Co., with exceptional opportunities for work and observation in every department of this well-managed paper mill. After that came four years at the Massachusetts Institute of Technology, studying Chemical Engineering, with occasional visits and conferences at paper mills. Following graduation, Mr. Stephenson taught Mathematics and Drawing and tutored in Science at a large boys' school, thus laying a foundation for work included in the elementary subjects included in the Textbooks.

While teaching at the Rose Polytechnic Institute, Mr. Stephenson had access to the strawboard mill of the Terre Haute Paper Co. During the three years in this position he studied, at first hand, many chemical and metallurgical industries. Some people are wont to disparage the college professor's knowledge of an industry because of his not having had extensive practical experience. Let such people try to teach a subject so fundamental to the pulp and paper industry as for example even an outline of the chemistry of cellulose and their attitude would change to one of appreciation of the college man's contribution to the advancement of the industry.

In 1913, Mr. Stephenson went to the University of Maine, where he continued to teach Elementary Chemistry and Industrial Chemistry, and organized and taught the various classes in paper making. Incidentally, a small plant for making hand-made papers was laid out and installed by him for the University. This work continued for nearly four years, during which time, the operation and problems of pulp and paper mills making a great variety of kinds and grades were studied by frequent visits and summer employment in the mills on the Penobscot River.

Mr. Stephenson became editor of the Pulp and Paper Magazine of Canada in 1916, a work which not only requires constant study of new developments but also affords opportunities for intimate association with the men in the mills who are able to write with authority on the various phases of the industry. The editor has visited more than a hundred mills in Canada and the United States and has had the benefit of personal explanation by the resident chemist, engineer, or manager, of many practical and new features of method and equipment.

The Committee feels that it would be difficult to find anyone better qualified than the person selected as editor as regards educational training, teaching, and editorial work, all of which are needed in the preparation of the manuscript and illustrations for the Textbooks on the Manufacture of Pulp and Paper.

The Canadian Pulp and Paper Association.

The Canadian Pulp and Paper Association was organized at a meeting held in Toronto on March 8th, 1913, brought about by the Pulp and Paper Magazine, in which articles had been published pointing out the advantages offered by such an organization.

The Association now comprises within its membership most of the large producing companies engaged in the pulp and paper industry, and has as auxiliary members, many of the technical executives and experts employed by these companies. It comprises the general association, an Executive Council and a number of "Sections" each devoted exclusively to some special branch of the industry. There are the technical Section, the Woodlands Section, the Newsprint Section, the Chemical Pulp Section, the Book and Writing Section, the Mechanical Pulp Section, the Board Section, the Wrapping Paper Section, the Felt Section, and the Coated Paper Section, each having distinct activities apart from those of the parent organization.

The general association meets in convention once a year in January; the Executive Council, upon the call of the President, and the Section at various intervals as may meet the needs of their special undertakings.

Headquarters are maintained at 701-703 Drummond Building, Montreal. Mr. E. Beck, is the Managing-Secretary in charge, with a staff of assistants. Any information desired concerning the industry is readily supplied upon request.

The objects of the association as set forth in its constitution are: "The consideration of matters of general interest to the pulp and paper industry, the promotion of its welfare, and the encouragement of social intercourse among its members."

Mr. Carl Riordon, of the Riordon Pulp and Paper Company, Limited, of Montreal, was the Association's first president, and had a great deal to do with successfully bringing it through its initial stages. Succeeding presidents have been Mr. I. H. Weldon, of the Provincial Pulp and Paper Mills, Limited, Toronto. Mr. John H. A. Acer, of Montreal; Mr. C. Howard Smith, of the Howard Smith Paper Company, Limited, Montreal; Mr. F. J. Campbell of the Canada Paper Company, Limited, Windsor Mills, Que.; Mr. J. A. Bothwell of the Brompton Pulp and Paper Company, Limited, East Angus, Que.; Mr. George Chahoon, Jr., of the Laurentide Company, Limited, Grand'Mere, Que., and Mr. Percy B. Wilson, the present incumbent.



MR. GEO. M. McKEE,
Vice-President C. P. and P. A.



MR. EDWARD BECK,
Secretary of the Association.



MR. F. J. CAMPBELL,
Chairman, Wrapping Paper Section.



MR. GEORGE CARRUTHERS,
Chairman, Technical Section and Tissue Section.

The Executive Council is made up of Mr. P. B. Wilson, President; Mr. Geo. M. McKee, Vice-President; and Messrs. F. J. Campbell, George Chahoon, jr., E. L. Crocker, C.R. Whitehead, L.R. Wilson, H.F.E. Kent, John F. Taylor, Geo. Carruthers, W. Earle Walker.

The principal business of the Association is the gathering together, compiling and distribution of authentic statistics relating to the industry; the standardization of manufacturing methods; the improvement of the technical side of the industry; the protection and perpetuating of the forests from which the raw material



MR. JOHN F. TAYLOR,
Chairman, Board Section.

is obtained; the study of freight tariffs and the most economical means of transportation; the encouragement of technical education and the promotion of efficiency; the surveying of imports and exports and other conditions tending to affect the industry's welfare; advertising, and the promotion of the foreign and domestic use of Canadian-made pulp and paper products.



MR. S. L. DE CARTERET,
Chairman, Woodlands Section.

The Association, in collaboration with American pulp and paper manufacturers, is now engaged in producing a series of technical text-books, covering all branches of the industry, and is also engaged in assisting in the training of young men who desire to make paper-making their vocation. Considerable sums of money have been devoted by the Association to these purposes. The Association also assists under-graduates of Canadian schools and colleges in finding opportunities for employing their vocations in paper mills in order to acquire a practical knowledge of paper-making and offers prizes



MR. GEORGE CHAHOON, Jr.
Chairman, Newsprint Section.

to those making the greatest progress. It contributes extensively to the literature of the industry and maintains a bureau for the purpose of supplying information, when desired, and in keeping the interests of the industry prominently before the public. An efficient Transportation Department is in charge of Mr. G. P. Rinckbie.



MR. W. E. WALKER,
Chairman, Felt Section.

Some Industrial Uses For Silica Gel.

By the Engineering Staff of the Silica Gel Corporation, Baltimore.

Editor's note: The pulp and paper industry has shown a sensible inclination to let the results of research guide the progress of the future. The peculiar properties of *Silica Gel* suggest a line of investigation which may bring information of great value. It will be seen in reading the following abstract of Bulletin No. 2, of the Silica Gel Corporation, Baltimore, Md., that the recovery of SO_2 in smelter fume, and from digester relief, the drying of air for various parts of the mill, the cooling of condenser water, and the purification of gases from sulphate mills, are problems which Silica Gel might help to solve.

Raw Materials Used in Manufacture.

The product known as *Silica Gel* is made by a patented process from water glass and either sulphuric acid or hydrochloric acid. Water glass is made from sand and soda ash and is material that is used at present in large tonnage. The raw materials which enter into the manufacture of *Silica Gel* are, therefore, obtainable in practically unlimited quantities.

The uses of *Silica Gel* may be grouped under four heads:

1.—Adsorption from the gas phase.
2.—Adsorption from the liquid phase.
3.—As a catalyst.
4.—As a "carrier" for catalytic materials.

While these various uses depend upon the same physical and chemical properties of *Silica Gel*, they are in reality quite independent. Hence this product has very wide application in a great variety of large industries, which would appear otherwise as wholly unrelated to each other.

I. Adsorption from the Gas Phase.

When air, or other similar gas, containing large or small quantities of the vapor of a volatile liquid, such as water, ether, alcohol, sulphur dioxide, etc., comes in contact with *Silica Gel*, the vapor of the liquid is selectively taken up, or adsorbed, by the *Silica Gel*, while the air, from which the vapors have been removed, passes on through unchanged. The adsorbed material may subsequently be driven out of the *Silica Gel* readily and cheaply, and, if desired, may be recovered in pure condition. The *Silica Gel*, having been freed from its adsorbed material, is then in condition to be used over again. Being chemically inert and very stable physically, it undergoes no alteration with use and thus has a practically indefinite life.

These properties give *Silica Gel* a wide application in a number of important industries.

Dry Blast for Iron Furnaces.—Gayley and others working independently over a period of years, showed that by partially drying the air entering the blast furnace, they were able very materially to increase the output of pig iron and at the same time effect a considerable saving in coke. In one experiment extending over several months, Gayley reported an increase in pig iron of 20 per cent, and a saving in coke of 5 per cent. Practical blast furnace operators today figure that working with a dry blast (0.7 grain of moisture per cubic foot) the output may be increased approximately 10 per cent, with a 10 per cent. reduction in coke consumption. Up to the present time the only practicable means of obtaining dry blast has been refrigeration, but notwithstanding the large margin indicated above, the cost of obtaining dry blast has more than offset the savings accomplished. *Silica Gel* offers a means of obtaining a drier blast than can be obtained practically by refrigeration, and at a much smaller cost.

In addition to dry air for the blast furnace, there are numerous other processes which require dry or partially dried air. These uses are quite varied and include furnishing dry air for drying materials of all kinds, regulation of the humidity of air entering factories, office buildings, etc. Air conditioning has grown into a business of large proportions and *Silica Gel* will find an extensive use in this field.

Manufacture of Ice.—Nearly all artificial ice is made today by the application of a very simple principle, which consists in rapidly evaporating a volatile liquid, such as ammonia or sulphur dioxide, in such a way that the large amount of heat necessary to accomplish this evaporation is abstracted from the water to be frozen.

The vacuum ice process is simpler than the ammonia process. Water is sprayed into a chamber in which a high vacuum is maintained. The rapid evaporation of a part of the water itself freezes the remainder. The high vacuum is maintained by means of a sulphuric acid absorber for the water vapor and a pump to carry away the small amount of air introduced with the water. After the acid has absorbed a certain amount of water, it loses its efficiency and must be replaced by fresh or concentrated acid. A complete vacuum plant must, therefore, include a concentrator for concentrating the dilute acid which is being continuously produced.

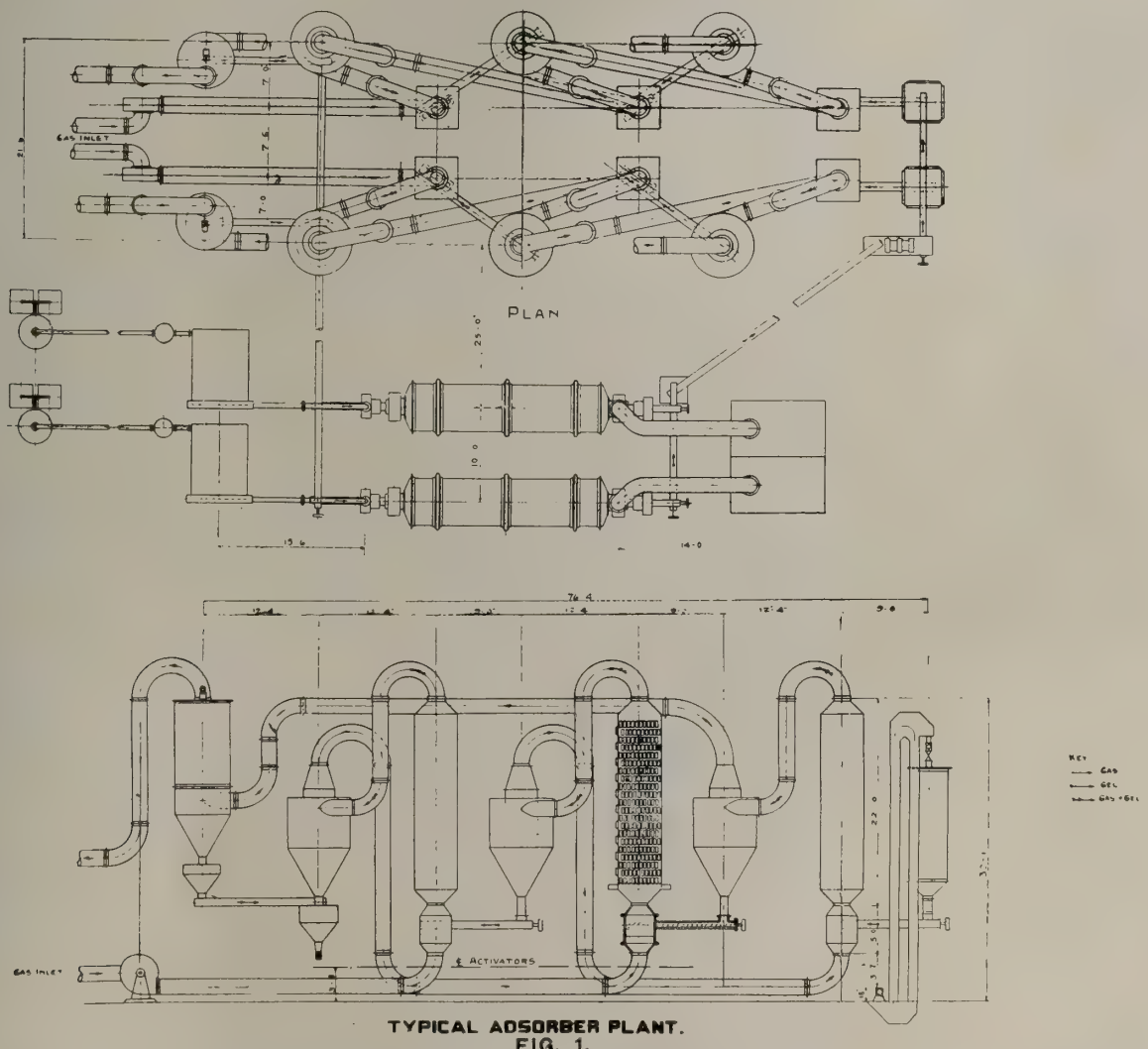
Several plants in the United States have been making ice commercially by the vacuum process for a number of years and the cost is less than that of the ammonia process. The one feature of the process which has prevented more extensive adoption has been the difficulty and expense of concentrating sulphuric acid. While this is not considered a very difficult thing to do by acid manufacturers, it requires a different type of operators than those usually employed in an ice plant.

The affinity of *Silica Gel* for water is comparable to that of sulphuric acid, and the water once having been taken up by the *Silica Gel* may be liberated from it far more easily and cheaply than from sulphuric acid. It has been conclusively shown that this material may be substituted for sulphuric acid in the vacuum process, thereby eliminating the only troublesome feature in a process which is essentially simpler, more hygienic and more economical than the ammonia process. Moreover, the *Silica Gel* vacuum process lends itself most readily to the design of a simple equipment for small household units.

The manufacture of ice presents a most attractive industrial application of *Silica Gel* because of the marked saving in installation and operating costs and the extensive outlet in this field.

Concentration of Sulphur Dioxide-Air Mixtures.

Silica Gel is destined to play an important part in the manufacture of sulphuric acid by both the lead chamber and contact processes, and also in the manufacture of liquid sulphur dioxide, a large and growing industry. The use of *Silica Gel* in the contact process for making sulphuric acid will be discussed later on when this material is considered as a carrier for catalysts. We shall accordingly confine ourselves here to a consideration of the application of *Silica Gel* in the lead chamber process and in the manufacture of liquid sulphur dioxide, and, incidentally, to the abatement of certain nuisances. (The application to the lead chamber process is omitted.—Ed.)



TYPICAL ADSORBER PLANT.
FIG. 1.

Manufacture of Liquid Sulphur Dioxide.

The manufacture of liquid sulphur dioxide is a large and rapidly growing industry. At present this material has an extensive use in a number of large chemical operations, notably in the paper and textile industries, in the metallurgy of copper, as a substitute for ammonia for refrigeration in small household plants and in many others. When a sufficiently cheap process of manufacture becomes available, it can be used in certain localities in the manufacture of sulphuric acid by both the lead chamber and contact processes. Inasmuch as there are now practically unlimited supplies of sulphur dioxide in the waste gases from various water will, it is obvious that with a proper mechanical metallurgical processes, there will be no raw material cost to speak of, and the entire cost of manufacture will be operating costs.

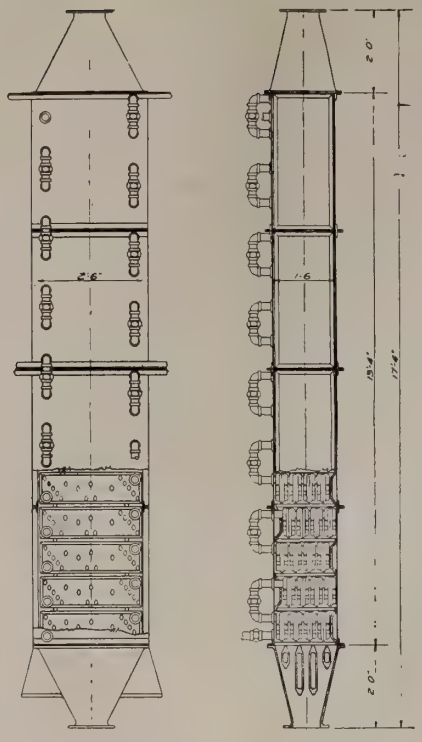
The present process by which liquid sulphur dioxide is made, starts with a mixture of air and sulphur dioxide gas containing from 4 per cent. to 8 per cent. sulphur dioxide. Cold water is then saturated with this mixture and the sulphur dioxide is liberated from the water solution under the influence of heat and vacuum. The resulting gas is dried and liquified by compression at a low temperature.

The *Silica Gel* process simply substitutes *Silica Gel* for water. When we consider that the specific heat of *Silica Gel* is about one-fifth that of water and that, weight for weight, the *Silica Gel* will take up under like conditions, about five times as much sulphur dioxide as water will, it is obvious that with a proper mechanical equipment for handling *Silica Gel* in process the *Silica Gel* method will prove much cheaper than the water absorption method.

Apparatus Required.

Before leaving the subject of adsorption from the gas phase, it may be said that, with the possible exception of the recovery of nitre gases, essentially the same mechanical equipment will be required for all the applications discussed above, with slight modifications in the case of the manufacture of ice.

For the past three years the Research and Engineering Departments of The Davison Chemical Company have been engaged upon an exhaustive study of the



TYPICAL ADSORBER
CAPACITY 700 C.F.M.
FIG. 2.

5. The refining of lubricating oil.

(Details are omitted.—Ed.)

Plants for Adsorption of Gases and Vapors.

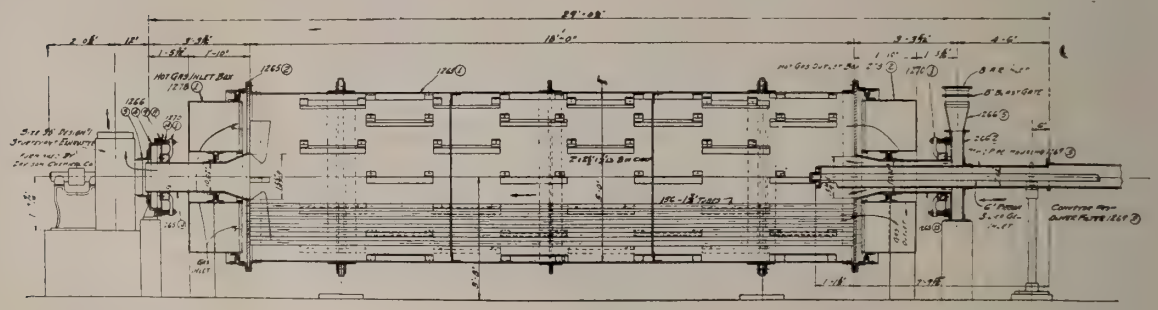
There are two general types of recovery plants, the "Dust Type" using pulverized *Silica Gel* and the "Bed Type" using granular *Silica Gel.*

Dust Type Adsorber Plants.

Figure 1 shows an adsorber plant of commercial size. It consists of three adsorbers in series, each with a dust separator and screw feeder to provide for a countercurrent passage of pulverized *Silica Gel* through the system, the *Silica Gel* becoming saturated at the left or gas inlet end of the system and the gas being thoroughly stripped of recoverable vapors by the time it is discharged at the right end where the activated *Silica Gel* enters. The process is controlled by the feeders and the inter-stage fans so that nowhere in the system is the velocity excessive or the pressure more than a few inches water column.

The *Silica Gel* in proper proportion is mixed with the gas and blown through the adsorbing system.

Figure 2 shows the construction of an adsorber. It is simply a vertical, enlarged gas flue containing standard cast-iron heat absorbers in which cold water is circulated. The mixed gas and *Silica Gel* are blown between the coolers which carry off the heat generated by the adsorbing process. The coolers are staggered and so spaced that the gas will have a low, but ample velocity to carry the *Silica Gel* and insure complete contact between *Silica Gel,* vapor, gas and heat transfer surfaces. All parts and accessories of the adsorbing equipment are of simple standard types.



GEL ACTIVATOR.
FIG. 3.

The saturated *Silica Gel* is separated in final cyclone and automatic bag type separators from the treated gas and goes next to the activator.

The *Silica Gel* activator, Figure 3, is a horizontal rotating steel cylinder with multiple flues and a flue box at either end. It is provided with axial feed and discharge for *Silica Gel* and evolved gases, and tumbling shelves on the walls to insure ample contact of the *Silica Gel* with the heating flues. The rotating flue boxes connect by flexible diaphragms to a fixed combustion chamber or waste heat source at one end and to a dust separator and condenser, or chimney at the other, depending on whether the evolved gas is to be recovered or wasted. All difficulties of alignment and leaky stuffing boxes are thus avoided.

The activator is designed to provide sufficient time and heating surface to activate the *Silica Gel,* which is then delivered to a cooling and storage hopper and automatically returned to the cycle.

comparative merits of various types of mechanical equipment for handling *Silica Gel* in process. The design, construction and testing of these various possible types has been a long and tedious process. Carrying out a policy early adopted, the Company has steadfastly refused to attempt a commercial installation until thoroughly satisfied that the essential features of the ultimate type of apparatus had been embodied. While this has meant considerable delay in making a first installation, it is felt that the policy which was followed has been amply justified. Now that this process of elimination is over, the Company is ready to prepare specifications for a complete *Silica Gel* installation which can be adapted, with only slight modifications, to any one of the applications discussed above. The type of equipment adopted is simple in construction and efficient and economical in operation.

II. Adsorption from the Liquid Phase.

The most important applications of *Silica Gel* under this head, as appears at present, are:

1. The refining of gasoline.
2. The refining of kerosene.
3. The refining of by-product benzol (light oil).
4. The refining of paraffin wax.

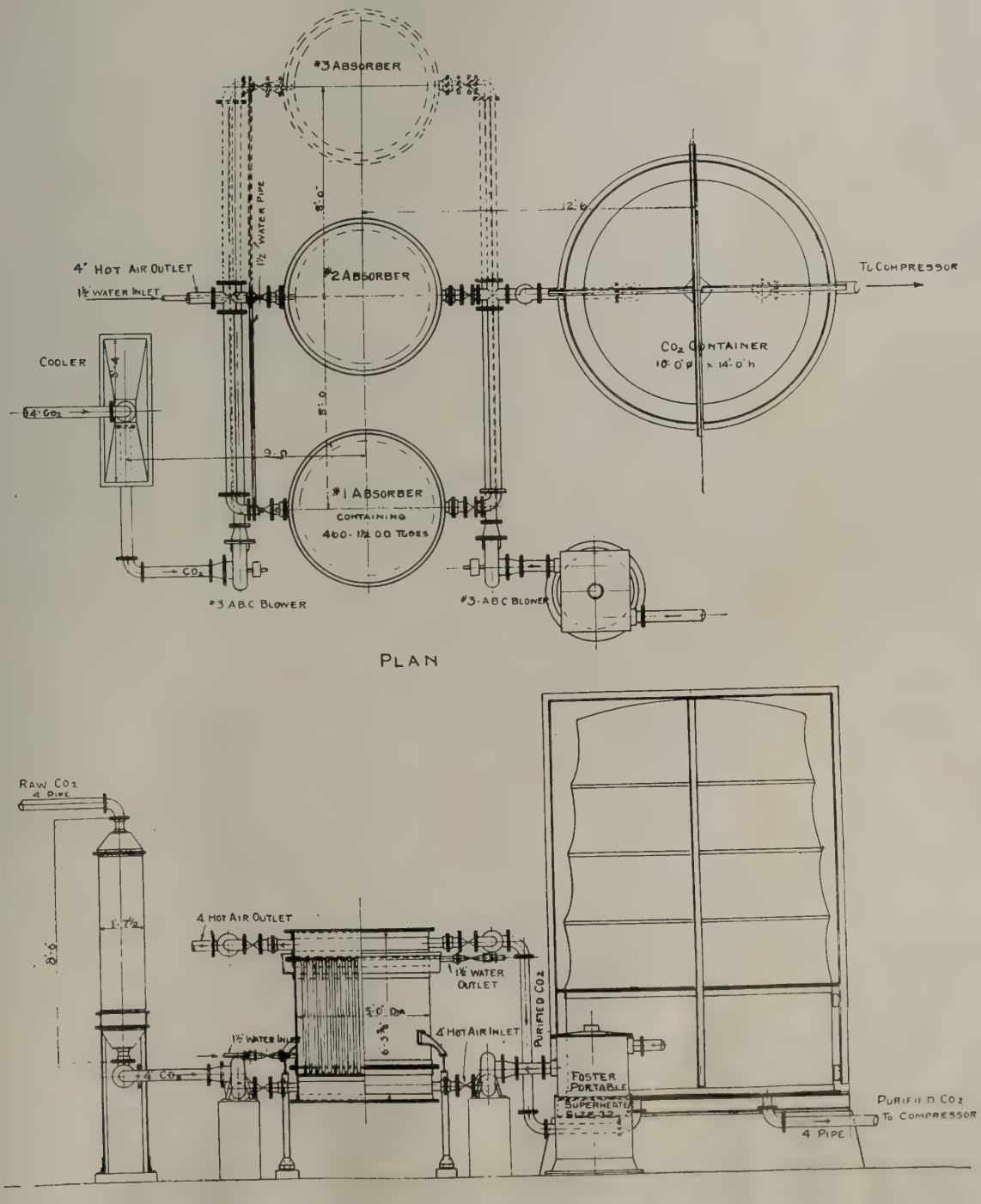
Bed Type Plants.

These are used for small scale applications of *Silica Gel*, such as the recovery of volatile vapors, or where it is desirable that there be no moving parts. The bed adsorber consists of a number of tubes filled with granular *Silica Gel* through which the gas or vapor to be treated is filtered, the tubes being surrounded by a flow of cooling water to carry off the heat of adsorption and maintain the maximum *Silica Gel* efficiency.

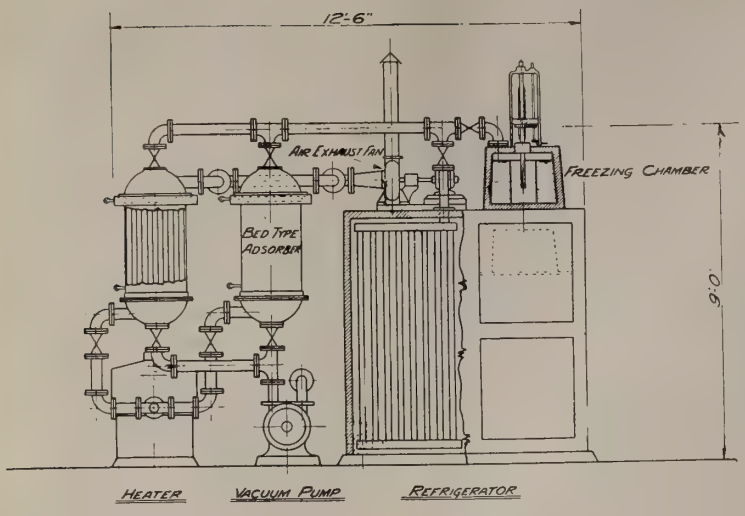
When one adsorber is saturated to the "break point" a second one is put in circuit until it, in turn, becomes saturated, the interval during which number one is out of circuit being utilized for the recovery of vapors previously adsorbed and for the activation of the *Silica Gel*. The latter is in some cases accomplished by blowing through the *Silica Gel* bed a sufficient volume of preheated air. In cases where the adsorbed material is also valuable, the *Silica Gel* is activated by direct steam or external superheat and the valuable vapors are secured in concentrated form.

After activation the adsorber is ready to return in circuit when another reaches the "break point". The effluent gas is thus constantly maintained at any desired degree of purity. For continuous operation the plant must consist of two or more adsorbers. The entire equipment is compact and simple.

Figure 4 shows such a plant for refining CO_2 gas from fermentation vats. It has a capacity of approxim-



CO² PURIFICATION PLANT.
FIG. 4



SILICA GEL REFRIGERATING PLANT

FIG. 5.

ately 30,000 pounds of CO_2 gas per 24 hours and removes moisture, alcohol and objectionable odor and taste from the gas. This CO_2 may then be liquefied and used for carbonating drinking waters, soft drinks, etc.

Refrigeration.

Figure 5 illustrates a *Silica Gel* refrigeration plant arranged to cool a refrigerator box and also make ice by the vacuum process. A bed type adsorber connected to the vacuum line maintains a high vacuum by its instantaneous adsorption of the evaporating water. There are two adsorbers for continuous service and a simple heater for alternately reactivating them. The plant shown has a capacity of 500 pounds of ice per 24 hours. It can be operated intermittently with economy as there is no volume of water or refrigerating brine to be precooled.

PAPER PRODUCTS MADE IN CANADA.

The following is but an incomplete list of the pulp, paper and allied products made in Canada:

Bags, blanks (plain white, coated, and colored), blotting, bond, book, boxboards, bristols, builders' boards, boards, building paper.

Calendar, carpet felt (plain and pleated), cartridge, catalogue, chipboard, coated boards, covers and crepe papers.

Drug, dry, dryproof, duplex waterproof.

Envelope papers.

Fibres, fibre boards, flat gummed, folding board, French folio.

Glassine, greaseproof, greys, groundwood pulp.

Hardware, hosiery.

Insulating paper.

Jute board.

Kraft pulp, kraft paper (wrapping and tissue).

Leather boards, ledger and lithograph papers.

Manila rope, mill boards, minerograph, M.F. and S.C. coated.

News board, newsprint paper.

Parchment (genuine and imitation), pasted, poster, program.

Roofing papers.

Sulphate pulp, sulphite fibre.

Tag manila, ticket board, tissue, tympan manila.

Wood boards (pure and filled), waxed and writing papers.

Paper Products.

Bags, boxes.

Cardboards, cartons for butter, eggs, meat, corrugated boxes, cores, cups.

Gummed sealing tapes.

Indurated fibreware (pails, scrub-boards, tubs).

Labels.

Napkins.

Roofing.

Sheating, shirt-front boards, shore-making boards, stair pads, suit and skirt boxes.



Picturesque Plant of the Alaska Pulp and Paper Co. (Courtesy Newsprint Service Bureau.)

Some Random Notes on The Pulp and Paper Trade

By G. R. HALL CAINE, C.B.E.

It is with some timidity that I venture to comply with the request of the Editor, that I should write a short article for the International Number of the Pulp and Paper Magazine.

Literary talent is by no means hereditary, and the fact that I possess a distinguished literary parent does not excuse the Editor for inflicting his readers with an article from my pen. However, this is his risk, so here goes!



MR. G. R. HALL CAINE.

In the first place, it is only fair to explain to those with the courage to read these notes that though I have been connected with the paper business all my life. (I am told that at the early age of two years I started testing the strength and fibre in my Father's M.S. by tearing up his new novel), yet my close study of matters Canadian, began only on my visit to this country in 1920, and have continued intermittently till now.

Therefore, as is the case with all things in life, knowing, as will be seen, very little about the subject, I am one of the best persons to criticize and speak with some degree of authority.

Our trade of pulp and paper has been through some troublesome times and a very severe test these last few years, in Canada no less than elsewhere.

A Financier once discovered (in recent years) that Sometimes Some Money was to be made out of the manufacture of woodpulp and paper, and the trade has ever since suffered from the consequences of this discovery.

To-day the Canadian pulp and paper companies, and other pulp and paper companies through the world, are suffering to an acute extent from an attack of too much Financier and too many Theorists.

When as a boy I gained my first real knowledge of the manufacture of paper, the best paper in the world was manufactured in Scotland (and still is, I venture to suggest, Mr. Editor). The old Scotch papermaker had learned to make his paper from the hard school of time and experience. To-day we have young boys, fresh from college, to tell us how to make paper—theoretically!

We have Theorists in the mill, Theorists in the forest, Theorists in the sales department—in fact we are full of theory, and we are passing through the worst time ever known in the pulp and paper industry. Still we must not entirely blame the Theorist for our unfortunate position.

There is our old Columbus friend the Financier who has a lot to answer for to the pulp and paper trade.

We have had two kinds of financing in our trade, good and bad, but most of our financing has been like the curate's egg — "Good in places". Likewise we have met two sorts of Financier, the good old solid kind and those I will call the "In and Out" variety. From the latter type of gentleman, we have suffered much in England.

The result is we are most of us like Atlas, trying to carry the world on our backs, in the way of Bond Interest, Sinking Fund Payments and Shameful Over-Capitalization.

Is it to be wondered at that pulp and paper mills find it difficult to make profits at to-day's market prices?

After all we must mostly blame ourselves for the present position. We were tempted by the Financier and we fell to his brandishments. We were overawed by the scintillating shimmer of the Theorist.

We have had our experience of both these gentlemen. Let us hope that now some of the old school will get road from the ditch into which it has been driven by read from the ditch into which it has been driven by these gentlemen, who out-Munchausen the celebrated Baron.

If this is done I have the greatest faith in the future of the pulp and paper trade. But of our late associates, we have had enough! May we in future say, like the raven—

"NEVER AGAIN."



Canadian paper going abroad.

Kinleith Paper Mills, Ltd.

By A. R. R. JONES

In and around the delightful town of St. Catharine's, Ont., there are grouped an extraordinarily large number of paper mills. Indeed, it may well be doubted whether anywhere else in the Dominion in an area of similar size there are to be found as many paper mills as are to be found in St. Catharine's and its immediate neighborhood. For the fact that this district is so favorite a location with manufacturers of paper, there are probably two main reasons. In the first place, it is very close to the source of supply of coal. And its contiguity to this source of supply has probably been a determining factor in its favor with more than one concern seeking a location for a paper mill. In the second place, it is blessed with an abundance of cheap water power. These two advantages are inestimable in a location, as all paper manufacturers will agree, and, in combination, they have resulted in St. Catharine's and district becoming a regular "happy hunting ground" for paper making concerns.



The Kinleith Mill is well placed and well equipped for making high grade papers.

Among the paper mills located in this territory, that of the Kinleith Paper Mills, Ltd., which is situated in St. Catharine's itself, just by the High Level Bridge, admittedly takes high place. Not only are the products of these mills far-famed for their high quality, as to which a word or two will be said presently, but the plant itself is remarkable for the excellence alike of its construction and of its equipment.

Fine Plant and Equipment.

The plant itself was originally built in 1900, and, at that time, was regarded as the last word in paper mill construction. In the years that have elapsed since then, it has constantly been enlarged and improved. In fact, by today it may be said to have been practically rebuilt. It is of brick, stone, and steel, throughout, and the various manufacturing units are arranged with that due regard to convenience and economy of time and effort so essential in a modern paper mill. In the important matters of heating, lighting, fire protection and ventilation, the plant is quite admirable. The same thing may be said of the general conditions under which the employees work.

The present equipment of the plant includes the following: Three 900-lb., two 1000-lb., four 1200-lb., three 1300-lb., and two 1800-lb. beating, and three refining engines; one 76-inch Fourdrinier, and one 96-inch Fourdrinier. The widest trimmed sheets turned out are 68-inch and 87-inch. The width of the super-calenders is 75, 56, and 42. Since 1916 the capacity of the plant has been doubled. Just the other day a considerable addition thereto was made by lengthening the wire of No. 2 machine, putting on an extra press, and adding twelve more dryers.

Concern's Officers and Output.

The officers of the concern are: Mr. H. F. E. Kent, president and managing director; Mr. H. H. Love, vice-president; Mr. A. G. Parker, treasurer; Mr. G. H. Jefferson, secretary; Mr. W. A. Anderson, plant superintendent, and Mr. L. A. Vance, sales manager. It has been mentioned that the mills at St. Catharine's were built in 1900. In 1905, the concern was taken over by W. J. Gage and Company, Ltd., and the late Sir William Gage was its president until his death, early this year. The offices are located at St. Catharine's, but the salesrooms are at 82-94 Spadina Avenue, Toronto, in the same building as the offices of W. J. Gage and Company, Ltd., and the Educational Book Company, Ltd. In fact, the three concerns have the same executives, but each company is independent of the others.

The capacity of the mills at St. Catharine's is one

of 60,000 lbs. every twenty-four hours. The output consists of book, bond, writing and lithograph papers. Most of this output is disposed of in Ontario, and a large part of it in the city of Toronto, but the reputation of the concern for the high quality of its products is Dominion-wide. Indeed, its reputation in this respect is very far from being confined to the Dominion. For it does an export business, which is not only considerable normally, but is also capable of almost indefinite expansion in the not remote future. Normally, it exports from five to ten per cent. of its products, according to conditions. The export field for the grades of papers manufactured by the Kinleith Paper Mills, Ltd., is a very wide one. Its products are exported, for example, to New Zealand, Australia and Japan, and to many other countries as well. The products are really the staples in those particular lines, and can be regarded as standard.

The Outlook for Business.

The demand for the specialties which the Company manufactures—namely lithograph papers, envelope papers and sulphite bonds—may be regarded as a very good general barometer of the condition of industry and commerce in general. For it stands to reason that when business is dull, commercial houses use considerably less of such commodities than they do when it is brisk. It is, therefore, encouraging from the point of view of the business situation generally, to learn that it is the experience of the Kinleith Paper Mills, Ltd., that business is improving month by month.. It seems that people are beginning to realize that prices in the lines manufactured have got down to rock bottom, and the realization of this fact is resulting in an increasing willingness to replenish depleted stocks. In fact, a period of progressive trade betterment from that the Company is working in there is, obviously, now on looks to be ahead. Along the lines of papers an immense field in both domestic and export trade.

Greatest Paper Producing Country.

It is plain from a talk which the writer had with Mr. Kent, the Company's president and managing director, that the latter is a firm believer in Canada's great future eminence in the paper industry. "Canada," he said, "is going to be the greatest paper producing country in the world. That is, provided that we take proper care of our forest resources in the way of pulpwoods. In this connection, one may mention that the Government of the Province of Quebec has shown itself alive for some time to the necessity of conserving her forest resources, and it is gratifying to see that the Ontario Government is now taking up the matter very seriously. The main handicap under which the Canadian paper industry is laboring—as is the paper industry in the United States to an even greater degree—is that of foreign competition of an abnormal kind. In many lines, paper manufactured in European countries is being sold on this side at a lower figure than that at which it can be manufactured in Canada. This, however, is a condition of things which is part of the aftermath of the war, and is, most likely, a temporary one."

Very naturally, with a business that has won for itself so enviable a name in the paper industry, the Kinleith Paper Mills, Ltd., has a very admirable administration. It is its efficiency of organization as well as its efficiency of manufacture, which is largely accountable for its success. In all industries, it is, of course, of the highest importance that the executive officers should be men of sound business training and judgment as well as versed in the technique of the particular industry. But especially, perhaps, is this essential in the various industries. There is no need to go into the reasons for this. Conditions in the industry in Canada have obviously been such, of recent months, that good judgment in executive officers has been invaluable to those concerns fortunate enough to possess such.

As has been said, the Kinleith Paper Mill Co., Ltd., is to be congratulated on its executive. Mr. H. F. E. Kent, the president and managing director is a prominent member of the Canadian Pulp and Paper Association, and has been chairman of the Book and Writing section of that organization. For twenty-seven years Mr. Kent has been connected with W. J. Gage and Company, and in 1916 he became general manager of the Kinleith Paper Mills, recently succeeding the late Sir William Gage as president of the concern. Mr. H. H. Love, vice-president, and Mr. A. G. Parker, the treasurer, of the Kinleith Paper Mills , Ltd., have both been connected with the Gage interests for many years. Mr. George H. Jefferson, the secretary of the Company, is well versed in the practical end of the paper-making. An Old Countryman by birth, he learned the business of paper-making with the Willis Paper Company of Belfast. He came to Canada some eighteen years ago, and until the year 1906 he was connected with the publishing business of W. J. Gage and Company. In the year last named, he accepted a position with the Kinleith Paper Mills, Ltd., and is now the secretary of that Company.



MR. GEO. H. JEFFERSON.

Other religions have risen out of man's search for God, but Christianity is God's search for man. And we have received it only to pass it on. It has made us what we are, and from us it must go to others.

The Forest Products Laboratorie Of Canada.

The Forest Products Laboratories of Canada, Montreal, are conducting, in their Division of Pulp and Paper, investigations of considerable importance to the Pulp and Paper Industry and have also some further lines of research in view which are expected to yield most useful results.

An interesting investigation recently completed relates to the value of "hemp hurds" as a paper making material. Hemp hurds are the waste stalks of hemp from which the fibre has been removed. Large quantities of this material, hitherto a mere waste product, are available in Canada. Some attention has been given to this subject in the United States where experiments have been made in which the soda process was used. The work at the Laboratories however, has been directed towards the application of the sulphite process. The results so far obtained indicate that while the material lends itself to sulphite cooking the resultant products has an extremely short fibre and is somewhat hard to bleach. The yield however, is large and the pulp might advantageously be used as a filler with longer fibered pulps.



MR. R. H. CAMPBELL,
Director of the Forestry Branch, Department of the Interior, and Head of the Laboratories.

Another investigation, dealing with the effect on groundwood pulp of storage under water, is rapidly approaching completion. The result of this research will be embodied in a paper to be given at the next meeting of the Technical Section of the Canadian Pulp and Paper Association.

The testing of pulps for strength is also receiving much attention at the Laboratories. In this connection a small hand sheet machine, after the pattern described by Wilen at the last annual meeting of the Technical Section, has been installed. A few minor changes have been made in the machine and we understand that it is now giving thorough satisfaction. This machine might well be thoroughly investigated by the Technical Section's Committee on Chemical and Physical Standards with a view to adopting it as a standard apparatus for making test sheets. The strength tests already carried out have been made on sulphite pulp the methods used being those recommended by the Committee on Testing Sulphite Pulp of the T.A.P.P.I. and E. Sutermeister. The results show that the method of beating adopted by the former gives the maximum strength for the stated duration of beating although it is not so convenient in practice as Sutermeister's method. The most feasible method of obtaining consistency of stock is that adopted by most of the Canadian mills rather than the cumbersome one of the U.S. Committee. The former is the forming of pats from definite weights of the stock, drying by pressing with a hot iron between cotton cloths until steam ceases to be driven off and then placing in a drying oven for 10 or 15 minutes, cooling and weighing.

The work outlined at the Laboratories for the immediate future includes the determination of the pulping qualities of Jack Pine by the sulphite process and a study of the resin troubles from this species. The cooking of Aspen Poplar by the sulphite process with a view to obtaining a cheap substitute for aspen soda-pulp is also receiving attention.

The Laboratories have for several years devoted attention to the analysis of papers, fibre boards, etc. This work involves a study of the methods of both chemical and fibre analyses, the latter requiring a knowledge of the structure of the various paper-making fibres. Any samples of papers, boards, etc., submitted will gladly be examined without charge. Full particulars concerning each sample should be furnished.

A comprehensive reference library is an indispensable adjunct to any research laboratory and, as the result of eight years work on the part of the technical staff, a very valuable collection of technical literature and references has been built up at the Forest Products Laboratories of Canada. Such a library cannot fail to be of the greatest value to the Pulp and Paper Industry.



MR. CLYDE LEAVITT,
Chief Forester, Railway Commission.

The Home of The Canadian Ingersoll-Rand Company.

One of the largest metal working industries in Canada.

The real history of compressed air as a factor in the industrial transmission of power dates from the year 1871. In that year the two pioneer concerns later united in the firms now comprised in the Ingersoll-Rand and Canadian Ingersoll-Rand Companies, were established. Starting with the rock drill and the need for compressing machinery which its invention brought about, the Company has been identified with practically every important development in the production and use of compressed air during the past half century.

The history of the Ingersoll-Rand Company is therefore synonymous with that of compressed air and of modern machine mining which the development of the air-operated rock drill made possible.

The Canadian Ingersoll-Rand Company, or Canadian Rand Drill Company as it was then called, was established in Sherbrooke in 1889, with a total staff of some twenty men, using small rented premises (about 40 x 60 feet) in a building on the Magog River, owned by the Jenckes Machine Company.

Increased volume of business required larger quarters, and both Companies moved later to a large plant on the banks of the St. Francis River. The Rand Interests used the Jencke's foundry and power and occupied a space of about 30 x 160 feet, at this time. The business expanded rapidly and about 1900, the Company finally moved to the present site in the upper part of the town and built its own plant.

The close association of the Canadian Ingersoll-Rand and Jenckes Machine Companies finally led to the taking over of the latter Company's plants, patents, drawings, patterns, fixtures, good will, etc., in January 1918, since which time the majority of the lines formerly manufactured by the Jenckes Machine Company, have been produced under the registered trade name "CIRCO."

"Jenckes Plant."

The property secured from the Jenckes Machine Company, included a well equipped grey iron foundry, pattern shop, structural shop, two machine shops, a centrally located power house and numerous storage buildings of modern construction.

The Jenckes Plant was operated continuously until May 1921, when it was decided to move some of the machine for equipment to the Upper Town Plant, so as to centralize manufacturing processes of the same class, as much as possible.

Paulson Barking Drums, and Bark Presses, Steel Frame Chip Screens, etc., are products of the structural shop located at this plant, and the largest shop, known as number "15" is equipped with a very large engine lathe, roll turning lathe, Lobdell Grinder, Roll Grooving Planer and other equipment for the rapid and accurate production and refinishing of chilled iron rolls, such as are used in rubber mills, paper mills, etc.

Sidings enter the yards and various buildings, providing excellent shipping facilities.

Site and Layout of "Rand Plant."

The "Rand" or main plant-occupying 23 acres—is located on slightly sloping ground, separated from the Magog River by the Station and Yards of the Canadian Pacific Railway, from which five parallel sidings enter the yards and buildings. Iron, coke and heavy foundry supplies, are received in the upper yard at the cupola level, and the finished product is shipped from the lower levels. Sherbrooke has the advantage of being served by four railways, being on the main line of the Canadian Pacific Railway from Montreal to St. John, the Montreal-Portland main line of the Grand Trunk, in addition to being the Northern Terminus of the Boston and Maine, and the headquarters of the Quebec Central Railway.

Inter-switching facilities are good, and good relations between the Company and the Railways, make possible much more prompt railway services than can be obtained in large centres. Electric power is cheap, and abundant.

Pattern Shop and Pattern Storage.

The Pattern Shop of any plant should be in close connection with the foundry, and in the case of the plant of the Canadian Ingersoll-Rand Company, the pattern shop is placed between the foundry and main office, so that it is easy of access both to the Engineering Department and foundry foreman.

The building is of brick construction, single-story, measuring 60 x 100 feet, well lighted all round, the natural lighting being helped by the fact that none of the neighboring buildings are close enough to obstruct the windows. The equipment is complete, including swing cut-off saws, band-saws, nip saws, buzz planers, sanders, emery discs, cylinder sanders, wood-turning lathes, etc.

A special feature of the layout is that the benches are arranged cross-wise to the windows; this arrangement has advantages both for lighting and for general convenience. Iron tables, with surface planed flat and edges straight and square, are in use for lay-out work, and have proved of very great value.

There are four pattern storage buildings. All patterns are stored on shelves and are easily located by means of a simple numbering system. Both patterns and shelves are numbered.

Foundry.

As previously mentioned, the sloping character of the site of the plant has been used to advantage in the placing of the various buildings. Thus the foundry is on the higher level, and all materials used in the cupolas are received in the upper foundry yard on the cupola level, so that no hoisting of materials is necessary. Sand for cores and moulds is mixed on an upper floor and supplied to the core department and moulding floor by means of chutes. The upper floor extends the whole length of the building and is used for storage of all kinds of lighter foundry supplies and equipment.

The Foundry measures 102 x 242 feet, has two cupolas and is equipped with a Mumford Jolt Ramming Machine, which when installed, was the largest in Canada. The equipment of special flasks is particularly thorough, which permits of making all moulds for regular lines on a manufacturing basis. There are also smaller jolt ramming machines for core work; Tabor Roll-Over Machines for side floor work and a full equipment of pneumatic sand-rammers for bench and floor use.

The ovens for baking dry sand molds and cores, are a special feature there being three large ovens, twenty-five feet square and two smaller ovens. The foundry is served by two cranes of fifteen and ten tons capacity and there are also jib cranes with pneumatic motor hoists in the bays and in the cleaning department.

The sandblast room used a combination of Pangborn, Sly and Ingersoll-Rand systems. This is essential, as some of the Company's Products require sandblast finishing. The cleaning department also makes use of pneumatic chippers and grinders. In addition to the Product of its own foundry, the Company uses large quantities of brass, bronze, malleable iron and steel castings, which are made to its specifications and analysis.

Foundry Yard.

Between the foundry and the compressor shop lies the foundry yard, in which are stored flasks and castings. The principal feature of this yard is that it is spanned by a 10-ton travelling crane, which is, of course, very much more convenient than a series of jib cranes.

"Number 2" Shop.

From this building came the largest production in Canada, of 8 inch shells, the second largest of 18 pr. shrapnel, in addition to thousands of 6 inch and 75 m.m. shells. Following the armistice, the shell machines were cleared out and stored, and the Compressor, Pump and heavy Machinery Departments moved up from the original building on the Company's present site — Number 1, which is now used as a finished products warehouse. This storage building is 303 feet long by 90 feet wide and is shown in one of the illustrations herewith.

Number two shop is of one-storey construction, 562 feet long by 202 feet wide, with basement extending under the northern half, the latter used as a general store room. The type of construction is of the heaviest, to support a loading of 250 lbs. to the square foot. With a view to supplying an abundance of light, the roof is of the "saw-tooth" Monitor type, the clear height under the monitor being 40 feet with 25 feet clear height under the side bays. The side windows are of the modern wide type, so that there is no lack of daylight in all parts of the shop.

In general, the equipment of this shop comprises vertical and horizontal boring mills, lathes, drill presses milling machines, grinders, gear cutters, Potter & Johnson Automatics, etc., Compressed air is used to a very large extent; pneumatic drills in erection work, chippers and grinders for finishing up frames, flywheels, etc., compressed air jets for cleaning out deep holes in drill-press work, blowing dust off benches or machine tools, etc.

An important feature of the work is testing; compressors, pumps, hoists and dozens of other machines are vehy carefully tested before shipment; one illustraton herewith, shows a Cameron Pump under test. This particular pump happens to be one of ten supplied to an Eastern Canada Pulp Mill on one order.



A battery of lathes in the Canadian Ingersoll-Rand plant.

Pneumatic Tool Department.

The accuracy necessary in the manufacture of pneumatic tools is little realized by the general public; close fits are absolutely necessary and yet the tools must not be delicate, and must stand up under hard service without frequent stoppage for adjustment or repairs. For these reasons, the equipment in this department is among the most modern in the plant, and inspection is exceedingly rigid. The bulk of the raw material passing through this department is alloy steel, which is used instead of cast iron, or other material, on account of its much greater strength. The lathe work is done as far as possible on automatics, or on turret lathes, both of which are well adapted for high speed and accuracy. Milling is handled by a large battery of modern vertical and horizontal milling machines.

Forge Shop and Hardening Department.

The Forge and Hardening Department ranks as one of the most important in the whole plant. Proper heat treatment will give almost any result required in the way of toughness, hardness, etc., and the majority of the parts that go to make up the rock hammer-drill, and pneumatic tools—and a great many other products—require a very complex heat treatment.

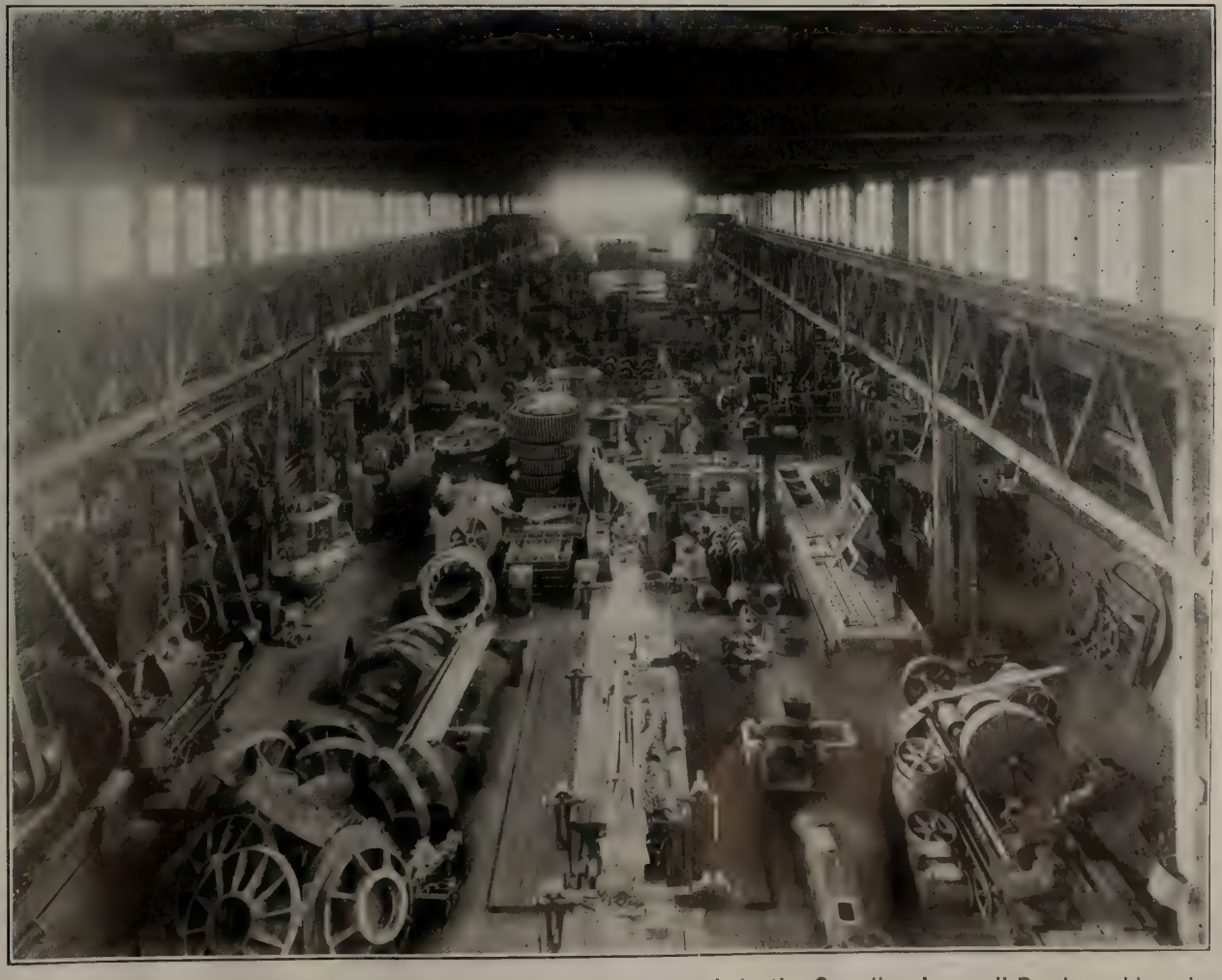
The Forge Shop is equipped with steam hammers, bolt presses, fuel oil furnaces, coke forges, etc., but the bulk of the work of the department is in the hardening and heat treatment section. For this part of the work there are large carbonizing furnaces, oil-treating furnaces, hardening furnaces, lead and cyanide baths, brine and oil tanks, quenching jigs, etc. While no place for white collars or clean clothes, this department is one of the most interesting in the whole plant.

General Products.

It is estimated that 80 p.c. of all the air compressors and a very large percentage of all the compressed air equipment used in Canada are of Canadian Ingersoll-Rand manufacture. The Ingersoll-Rand Company maintains Branch Offices in all parts of the world and Canadian Ingersoll-Rand products are exported through their offices to various parts of Europe, Africa, Asia, South America, Australia, etc.

Through its own branches extending from coast to coast, the Company is represented in practically every important centre of the Pulp and Paper Industry in Canada and its equipment is in use by such firms as Abitibi Co., Brompton Co., Canada Paper Co., Ontario Paper Co., Laurentide Co., International Paper Co., and others too numerous to mention.

Responsible visitors are at all times welcomed and any mill executive who has an hour or two to spare when in Sherbrooke would find a trip through this plant of great interest and well worth the time required. This may be arranged in advance or by calling at the office.



Not a stage setting, just the huge machines and variety of work in the Canadian Ingersoll-Rand machine shop.

Garden City Paper Mills Company Ltd.

Pretty nearly ideal locations are those of the two plants of the Garden City Paper Mills Company, Ltd., situated at St. Catharines, Ont. and Merritton, Ont., respectively. They possess the great advantages of abundance of power, contiguity to large consuming and manufacturing centres and a favorable situation generally in respect of efficiency combined with economy in paper manufacturing.

At its No. 1 plant at St. Catharine's the Company manufactures extensive lines of various grades of paper. These include toilet paper, tissue, fruit wraps, manifold waxing papers, strong lightweight wrappings, lightweight carbonizing papers and various other lightweight specialties. A highly popular line turned out



MR. LAUREN H. GARDNER.

from this plant is that of folded towels. This folded towel is known as "The Northern" and it is used extensively not only in lavatories, bath-rooms, etc., but also very widely in garages, both public and private.

This No. 1 plant is situated on Lock Seven, Old Welland Canal ,at which point the Company owns a first-rate water power. The machinery installed, which includes an 84 inch Harper Fourdrinier, is all of the most modern and efficient kind. This, together with the admirable arrangement of the mill, has resulted in making the plant a model of which a modern tissue and toilet paper mill ought to be.

The No. 2 plant, which is at Merritton, is the "Converting Plant", and here is produced a range of lightweight was papers — a department which is in process of development on a largely increased scale.

The capacity of the two plants is for 3,500 tons per year. Both plants are working full all the time—a highly gratifying state of affairs, at the present time, and one which is, no doubt, largely attributable to the satisfaction given by the Company's products. The shipping facilities are excellent. Under the progressive management which characterizes the Company's operations, and which makes it a prime factor of policy to maintain unimpaired the highest standard of quality in its output, the Company's products enjoy a high reputation not only in Canada but in many other countries as well.

Mr. Lauren H. Gardner is president and general manager of the Company; Mr. R. E. Myers, vice-president; Mr. Charles V. Syrett, secretary-treasurer; and the other directors are Messrs. H. J. Severance and Leo. E. Charles.

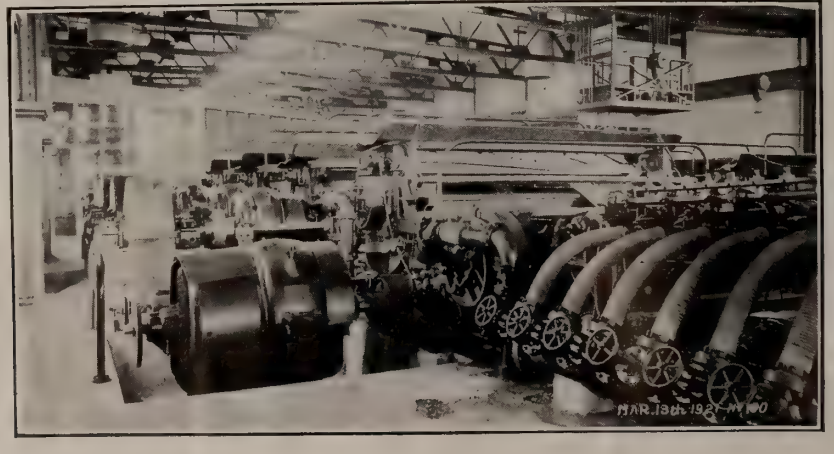
PULP AND PAPER PERSONALITIES.

S. J. B. Rolland.

Mr. S. J. B. Rolland comes from one of the oldest paper-making families in Canada and followed his father the late Senator Rolland, in manufacturing fine papers. Having conducted the affairs of the original mill at St. Jerome, of which he was the first manager, he founded, in 1910, the town of Mont Rolland and there established the second mill of the Rolland Paper Company. This little town is an ideal spot for a mill manufacturing high grade papers. It is situated only 40 miles from Montreal in the famous Laurentide district — the Switzerland of America. The population is almost entirely the employees of the company and their families. The town has its own schools, city council, church and moving picture hall and the employees are encouraged to build their own homes and become permanent residents and property owners.

Mr. Rolland has held many important positions. He was mayor of the town of St. Jerome for fifteen years and there established a Chamber of Commerce. He has for many years been a member of the Canadian Manufacturers' Association, and is an officer of the Montreal Branch. He is director of the Provincial Bank of Canada and a member of the Canada Club, a former president of Club Chapleau, a fishing and hunting association and is interested in philanthropic work, as shown by his membership on the Board of Administrators of Notre-Dame Hospital.

Mr. Rolland's official character is of an international nature since, in 1900, he was the president of the first association of Canadian pulp and paper makers, and in this capacity he represented the industry at the World's Exposition in Paris.



The back side of No. 8 and No. 9 Laurentide machines, showing section driving motors.

Canada's Pulpwood Resources.

By EDWARD BECK.

Canada's pre-eminence as a paper manufacturing country rests, primarily, upon the possession of large areas of commercially available pulpwood, in which spruce, hemlock, balsam, fir, jack pine, tamarack, poplar and basswood predominate. Just how much pulpwood is available it is impossible to state. No comprehensive and reliable survey has ever been made. Estimates vary widely and are mostly unreliable. One estimate gives the forest mileage as 350,000 square miles and the pulpwood contained therein as 1,033,370,000 cords. Another authority declares that in less than fifteen years Canada's supply of commercially available pulpwood east of the Rocky Mountains will have become exhausted, due to increased consumption and enormous wastage by fire and insects.

Of the western Provinces, British Columbia is the only one possessing pulpwood forests in abundance. No official survey has ever been made of the standing timber in that province, neither is any authentic estimate avilable. An estimate credited to the Dominion Commission of Conservation gives a total of 340,000,000 cords of spruce, western hemlock and balsam in Western Canada, distributed as follows: Prairie Provinces, 85,000,000 cords; British Columbia, 225,000,000 cords. It is known that a considerable proportion of the supply is at present commercially inaccessible. Doubtless, with the ever-increasing demand for pulpwood and its products the forests of British Columbia will become more and more in demand.

A recent study of the pulpwood situation in Eastern Canada, conducted by Mr. Clyde Leavitt, Dominion Forester, for the Commission on Conservation of Natural Resources, gives a total estimate of actually available spruce and balsam, after making deductions for wood withheld from cutting by provincial regulations and for waste and loss in logging and driving, as well as for defective balsam, in Quebec, New Brunswick, Ontario and Nova Scotia, as, roughly speaking, 306,000,000 cords, with a possible addition of 38,000,000 cords in the case of Ontario, taking for granted the early extension of the Temiskaming and Northern Ontario Railway from Cochrane to James Bay. These figures are distributed as follows:—

Provinces.	Cords.
Quebec	155,000,000
New Brunswick	26,000,000
Ontario	100,000,000
Nova Scotia	25,000,000
Total	306,000,000

It must be borne in mind that the areas of forest in Eastern Canada which are reasonably accessible to existing means of transportation have, to a very considerable extent, been culled over, or logged out, during the period since the earliest settlement of the country. The original stand has thus, by cutting and by fire, been reduced to a very material extent. Probably not less than one-fourth of the balsam in Quebec and one-third of the balsam in New Brunswick has been destroyed by the budworm during the past ten years.

While none of the Provinces has what may be termed a perfected forestry system, all are working to that end. Adherence to a rigid system of diameter limit regulation, such as is for the most part in effect on Crown lands in Quebec and New Brunswick, does not by any means constitute really advanced forestry practice. At the present time, merely a start has been made in gathering the specific knowledge necessary for carrying on scientific forestry, through research by the provincial Forest Services of Quebec, New Brunswick and Ontario, the Dominion Forestry Branch, the Laurentide Company, the Riordon Pulp and Paper Company, the Bathurst Lumber Company, the Abitibi Power and Paper Company, the Spanish River Pulp and Paper Company, and the Commission of Conservation of Canada. The latter organisation is co-operating in this work with the Forest Service of New Brunswick and with the several commercial companies mentioned.

The Province of Quebec.

The Province of Quebec imposes a diameter limit of 7 inches upon balsam and swamp spruce and 12 inches upon all other spruce. Consequently, there is a very considerable amount of this timber, comprising the capital or growing stock, which is not allowed to be cut because of this restriction. In the second place, there is always a shrinkage between the woods and the mill, due to the waste in logging, merchantable material left uncut which will be lost because of insects, decay or windfall before the next cut, logs stranded along the shores of lakes and streams, and logs lost by sinkage during the drive. To get at the amount of timber which may actually be available at the mill, it may conservatively be estimated that a deduction of at least one-third must be made, due to those several items of shrinkage. If such a deduction be made, it would leave of really available spruce and balsam, approximately 100 million cords on licensed Crown lands, 30 million cords on unlicensed Crown lands and 25 million cords on privately owned lands, or a total of 155 million cords.

According to the Dominion Bureau of Statistics, the 1918 cut of spruce and balsam in Quebec for pulpwood and lumber, was nearly 3 million cords. Of this amount, 885,772 cords was exported to the United States and may be credited to lands in private ownership. Also, a considerable volume of the wood from privately owned lands was manufactured in Canada.

Taking the situation as a whole, with 155 million cords of actually available spruce and balsam, on the basis of delivery at the mill, and a cut in 1918 of around 3 million cords, it is estimated that Quebec has, at the present time, the equivalent of 52 years' supply.

Beyond this 52 years' supply of available pulpwood, at the 1918 rate of cutting, dependence must necessarily be placed upon annual growth for the continuance of operations. As a matter of fact, the rate of cutting is increasing steadily, due to new developments and the extension of existing plants. In addition to the accelerated rate of cutting, it must be borne in mind that some fires will inevitably occur and that there will be serious losses from insects and decay. Balsam is particularly susceptible to attacks by the budworm and to injury by butt-rot and heart-rot. It is estimated, for

example, that around 25 per cent of the balsam in Quebec has been destroyed by the budworm in recent years, as already stated.

Based on a careful calculation and taking into account all of the numerous factors it is estimated that the pulpwood forests of Quebec, under proper management and direction, may reasonably be expected to yield an annual growth of three million cords on licensed



Logs in Storage Boom at a Newsprint Mill in Ontario.

Crown lands, one million cords on unlicensed Crown lands and one million cords on privately owned lands, or a total annual yield of five million cords a year of accessible and available spruce and balsam, as an offset to the three million cords now being cut annually. It will be seen that on this basis, the annual net increment would be two million cords. But this will not be realized without better protection and propagation of new growth, i. e., we must have *proper forest management.*

The Province of Ontario.

The best information which the Commission of Conservation has been able to obtain in regard to the pulpwood resources of Ontario indicates the existence in that province of a total of 250 million cords of spruce and balsam, of which 85 million cords are on licensed Crown lands, 140 million cords on unlicensed Crown lands and 25 million cords on privately owned lands. Of this total amount, 145 million cords are believed to be commercially accessible to existing transportation and 100 million cords are estimated to be actually available, after deducting for waste and loss in logging and driving and for defective balsam. In case the T. & N. O. Railway is extended from Cochrane to James Bay this total of actually available pulpwood might be increased to 138 million cords.

The 1918 cut of spruce and balsam in Ontario, for pulpwood and lumber, was, as nearly as can be determined from the Census Bureau statistics, slightly over 1,116,000 cords. This includes quantities consumed or produced in the province, as well as exports. Additional pulp and paper plants are being established, and extensions to some of the existing plants are under way, so that there is every reason to expect that very shortly the cutting of spruce and balsam will be at the rate of 1.5 million cords per year or more.

At the 1918 estimated rate of cutting, Ontario's really available spruce and balsam would be equivalent to 90 years' supply. When, however, the rate of cutting for pulpwood and lumber is increased to 1.5 million cords annually of spruce and balsam, this would represent only 67 years supply of wood accessible to existing transportation and really available, after deducting for less and waste in logging, driving, and for defective balsam. It must be remembered that most of the spruce and balsam now being cut for pulpwood is from 100 to 200 years old or more; also, that there is a heavy loss from windfall in the under-sized timber, after logging. In very many cases of heavy cutting, a second operation may not be worth while until from 40 to 60 years have elapsed.

If a possible growth rate of two per cent be assumed upon 145 million cords of commercially accessible spruce and balsam, there would be indicated a possible production of 2.9 million cords per year, which, of course, would leave room for a great expansion of the industry beyond what is under way at present. Such a rate, under present conditions is by no means certain.

In case the T. & N. O. Railway is extended from Cochrane to James Bay, it has been estimated that an additional 55 million cords of pulp-wood might be made available, raising the total estimate of commercially accessible spruce and balsam in the province to 200 million cords. This at 2 per cent would produce 4 million cords of annual growth per year, of which advantage could be taken were logging to be so conducted as to leave cut-over lands in a productive condition.

The exports of pulpwood through Ontario ports to the United States were in 1915, 202,239 cords; in 1916, 149,745 cords; 1917, 161,652 cords; and 1918, 199,421 cords, the great bulk of which was spruce and balsam. A large proportion of this is no doubt from settlement lands in process of clearing. Not all this material was cut in Ontario, the Customs returns showing only point of exit from Canada. The amount cut in Quebec and exported through Ontario ports can not be determined from any records available. This point applies of course to New Brunswick as well.

A further point with reference to future growth is that large areas of pulpwood lands in Northern Ontario, as well as in Northern Quebec, are being cleared up for settlement, and will never again produce a crop of pulpwood timber. This process of crowding out the forest will increase in future years. Also, a large area of timber land in Central and Southern Ontario is not a material factor in the production of pulpwood, other species predominating, such as white pine, red pine, hemlock and the various hardwoods.



This is how a big Canadian Mill Stores Wood for Winter Use.

The Province of New Brunswick.

The entire Crown lands area of New Brunswick amounts to approximately 7,500,000 acres. From this figure, a deduction of perhaps 2,000,000 acres must be made for the large barrens, the condition of which is due for the most part to repeated fires, supplemented by poor drainage. This would leave an area of 5,500,000

acres, most of which may probably be termed forest land. The area of Crown land actually under license to cut timber during 1919 was 6,332,000 acres. This certainly includes a considerable area of water surface and barrens, so that we may conclude that the area of actual forest land is around 5,500,000 acres, checking with the figure above deduced. There are practically no areas of unlicensed Crown timber lands in the Province.

It is estimated that this 5.5 million acres of Crown lands may contain 20 million cords of spruce and balsam. In this connection, it must be remembered that there are considerable areas of hardwood lands containing little or no spruce and balsam; also that the Crown timber lands have been logged over to a greater or less extent from the period of early settlement and that fires have caused heavy damage to the stand.

Of settlement lands containing timber it is estimated that there may be within the province 2,500,000 acres. These lands are accessible to transportation and have, for the most part, been heavily cut over for many years past. The amount of spruce and balsam on these lands may be estmated at approximately 4 million cords.

There are approximately 4,500,000 acres of privately-owned timber lands, mostly held by commercial concerns. These lands may contain 12 million cords of spruce and balsam.

New Brunswick's total estimated spruce and balsam amount to 36 million cords, of which 26 million cords are regarded as actually available, after deducting wood which cannot be cut, under provincial regulations and allowing for necessary waste and loss.

Thus, there are within the province approximately 12,500,000 acres of lands more or less covered with forest, and containing probably around 36 million cords of spruce and balsam. This is an average stand of 2.9 cords per acre for the entire area, and is believed to be within the bounds of reason.

The 1917 cut of spruce and balsam for lumber and pulpwood was approximately 1,250,000 cords, as nearly as can be determined by the Census Bureau statistics. In 1918, it was decreased to 987,000 cords. At the 1917 rate of cutting, the existing supplies of timber would be sufficient for less than 30 years. At the decreased rate prevailing in 1918, there would be supplies for 36 years, assuming that the entire estimate will be available at the mill. If, however, deductions be made, as in the case of Ontario and Quebec, for Crown timber over the diameter limit prescribed, for waste in logging, loss in stream driving, and merchantable material left uncut that will be destroyed by insects, decay and windfall before another cut, there are but 26,000,000 cords of really available spruce and balsam on the basis of scale at the mill. This, at the 1917 rate of cutting would represent but 21 years supply, which would be extended to 26 years at the reduced rate prevailing in 1918.

Of the 987,718 cords of spruce and balsam manufactured within and exported from New Brunswick in 1918, 374,040 cords was pulpwood, of which 263,907 cords was exported to the United States. Thus, 70 per cent of the pulpwood of New Brunswick is exported in the raw form for manufacture in United States mills, as contrasted with 20 per cent from Ontario and 45 per cent from Quebec. In 1917, the percentages of pulpwood export were: New Brunswick, 61, Ontario, 13.6, and Quebec, 37. The pulpwood exported is of course to be credited to privately-owned lands, in addition to an unknown amount manufactured within the province.

If an average rate of volume production of 2 per cent be applied to the total estimated stand of 36 million cords, the annual volume increment would thus be 720,000 cords, which is less than three-quarters of the 1918 cut, and only 57 per cent of the 1917 cut. Thus, cutting of spruce and balsam in the province of New Brunswick is progressing at a rate much more rapid than the estimated annual growth.



MR. F. J. D. BARNJUM.
Some prophets tell of our shortcomings. Mr. Barnjum tells us, after thorough investigation, that we are coming short, unless we keep Canadian wood for conversion in Canada.

The Province of Nova Scotia.

The amount of spruce and balsam in Nova Scotia may roughly be estimated at 25,000,000 cords. The 1917 cut of spruce and balsam within the province, for lumber and pulpwood, was equivalent to 313,812 cords. In 1918, this had dropped to 206,846 cords. Thus, at the 1917 rate of cutting the supplies of spruce and balsam in Nova Scotia would be equivalent to 80 years' supply. The forest on the mainland has been heavily cut over since the early settlement of the country, and enormous damage has been caused by fire. On Cape Breton Island, however, there are large quantities of spruce and balsam, particularly the latter, which it has not yet been found commercially feasible to operate. This fact accounts for the large apparent supply of pulpwood species in Nova Scotia.

Notwithstanding the fact that practically all its forests are in private ownership, so that there is no legal restriction upon the export of raw pulpwood, such exports are extremely small. In 1912, the exports of raw pulpwood from Nova Scotia to the United States were 5,773 cords; 1914, 1,557 cords; 1915, 3,310 cords; 1916, 3,735 cords; 1917, 770 cords, and in 1918 there was no raw pulpwood exported. Speaking generally, the pulpwood cut in Nova Scotia is there manufactured into groundwood pulp, largely for export. There are no newsprint mills within the province.

There are no statistics available showing the exports of woodpulp to various countries, separately by provinces. Since, however, more than 90 per cent of Can-

ada's total export of woodpulp in 1917 went to the United States, it must be obvious that the contribution of Nova Scotia to the paper making industry in the United States must be very considerable. On this basis Nova Scotia gets the benefit of industrial development due to local manufacture into woodpulp, while the paper makers and publishers in the United States are in identically the same position as would be the case were the pulpwood exported in the raw state.

Rate of Consumption.

Some idea of the rate at which pulpwood is being used in Canada may be gathered from the fact that the annual consumption in Canada increased from 482,777 cords in 1908 to 2,210,744 cords in 1918, and is constantly increasing. This takes no account of the pulpwood exported.

A report issued by the Canadian Government in 1916 states: "The quantity of pulpwood manufactured into pulp in Canada has been steadily gaining on the amount of wood exported to other countries in the unmanufactured state. In 1908, 482,777 cords were manufactured into pulp in Canada, and 794,896 cords were exported in the raw state. In 1912 the figures were: manufactured in Canada, 866,042; exported in the raw state, 980,868. The dividing line was crossed in the year 1913, since which time the quantity manufactured in Canada has exceeded that exported. In 1915, 1,405,836 cords were manufactured in Canada and 949,714 were exported in the raw state. In 1916, these figures had risen to: manufactured in Canada, 1,764,912 cords; exported in the raw state, 1,068,207 cords, showing that 696,705 cords more were manufactured into pulp in Canada than were exported in the raw state to be manufactured abroad."

The years 1918 and 1919 brought a heavy increase in the quantity and value of pulpwood exported and a corresponding increase in the amount manufactured at home. The export figures from 1910 to 1919 inclusive (government fiscal year from April 1 to March 31) were as follows:

Year	Cords.	Value.
1910	940,000	$6,210,042
1911	847,000	5,340,592
1912	980,868	6,695,833
1913	1,035,000	6,806,945
1914	972,714	6,817,311
1915	949,714	6,817,311
1916	1,068,207	5,743,847
1917	1,017,848	6,448,198
1918	1,325,565	8,339,278
1919	1,597,042	15,386,600
1920	838,732	8,454,803
Total	11,583,484	$83,632,207

With the rapidly diminishing supplies of pulpwood in other countries, the importance of conserving and utilizing Canadian wood to the best advantage is daily growing more pronounced. Evidence of American dependence upon this supply is not wanting.

Mr. P. T. Dodge, president of the International Paper Company, the largest producers of newsprint on this continent, is on record as saying:

"The great development of the newsprint industry from 1880 to the present day has made terrible inroads on the spruce forests in the United States east of the Rocky Mountains and, on the basis of the consumption of about 1½ cords of wood in the manufacture of one ton of paper, and an average of five cords of pulpwood to the acre, it requires only elemental arithmetic to calculate the vast areas of forest that have passed through the printing presses of the land into oblivion in the past thirty-seven years.

"It is a lamentable fact that aside from some large tracts in New England and New York that have been carefully conserved by two large paper companies, there is not a stand of spruce to-day east of the Rockies that would justify the erection of even a fifty-ton mill. Manufacturers in this country, therefore, have had to look to Canada, to the spruce forests of Ontario, Quebec, New Brunswick and Nova Scotia for the greater part of their pulpwood. The mills of the United States during the year 1917 consumed 5,536,802 cords of spruce wood, and, it is safe to say, nearly two-thirds of this was imported from Canada."

The Forest Service section of the United States Department of Agriculture at Washington, in 1919, estimated that in less than twenty years 95 per cent of the pulp and paper mills in the United States, more especially those located in the Eastern United States, will have practically exhausted their supplies of spruce, hemlock and fir. The annual cutting of these woods in the New England States and in New York is about 3,200,000 cords. At this rate the supply will last seventeen years. In the lake states, cutting at the rate of about 3,000,000 cords a year the supply will last eighteen years. In the case of Maryland, Virginia and North Carolina, the available supplies of wood being smaller, the situation is more serious. At the rate of 1,470,000 cords a year the supply will be exhausted in these states in ten years.

It is only in the Western States that the supply is in no danger of exhaustion. But over ninety per cent of the American paper mills are located in the East, and it is really only the situation in this part of the country which is of interest so far as any consideration of the immediate future of the industry is concerned. Paper mills cannot be moved about the country and pulpwood cannot be transported long distances economically.

The United States must depend for its future supplies of pulp and paper either upon the Canadian supply of wood, the greater exploitation of the wood resources of the American Northwest or the adoption of a national policy of economy in connection with the various wood product industries, coupled with a national policy of forest conservation and reforestation. The Forest Service already has under way comprehensive plans for the development and regeneration of American forests. It anticipates that in the future operations will be so conducted as to increase reproduction of trees valuable for lumber and paper purposes. Efforts are already being made to have all the mills employ trained foresters to supervise cutting and to provide for reforestation. Whatever may be the eventual outcome of these efforts, it seems likely that for some time to come the United States will continue to draw at least one-third of her supply of wood products from Canada.

The lesson in this for Canada is that not only should the provinces continue their efforts at conserving their supplies of pulpwood, but they must, if they would enjoy the full benefits of our heritage, apply them more intensively.

Most of the wood now exported in its unmanufactured state is cut from freehold lands and settlers' lots, and while it is in great demand and furnishes a source of temporary income appreciated by the jobbers and settlers, the policy which permits it to be done is short-sighted and the practice one that ought to be discouraged.

The Fort Willam Paper Co., Limited.

Construction on a Groundwood Plant for the Fort William Paper Company, Limited was undertaken by the Management Engineering & Developing Company of Dayton, Ohio in August, 1920. During the tour of the Imperial Press Conference, Lord Birkenhead cut the first sod and real work started early in September.

In spite of many set backs due to labor shortage, lack of facilities and transportation, construction was proceded with rapidly throughout the winter months, and the plant placed in operation on April 30th 1921, or about two months under the time limit set for the work.

The layout of the plant is such that future extensions were carefully considered, both as to the present plant which can be very easily enlarged without interference to operation, and for additions, such as a Sulphite Mill and News Mill, together with boiler house equipment as required.



COL. C. H. L. JONES.

The plant consists of a slashing and barking room and grinder and wet machine rooms, fully equipped with modern machinery. The slasher and barker rooms handle about 300 cords of watered wood per twenty-four hours and are equipped with two Ingersoll-Rand barking drums 10' diameter by 30' long. This wood is handled by systems of conveyors to the rossed wood blockpile and to the charging floor of the grinder room. The grinder room is equipped with six magazine grinders in pairs, power being supplied to each pair by one Westinghouse motor, or a total of 8,400 H.P. required. Each unit is capable of somewhat better than 20 tons pulp slush daily.

The slush passes through to the wet machine room where it is screened with centrifugal screens and is then delivered by gravity to the wet machines. The product is then pressed by six 600 ton hydraulic presses, and throughout the Summer months baled for shipment. For this purpose two baling presses were installed, which are able to handle the total output of the mill daily. All machinery is motor driven, power being supplied by the Kaministiqua Power Co., Limited.

As is the case in the starting up of many new mills, minor obstacles had to be overcome, and much industrial education had to be carried on, because of lack of familiarity of the employees with groundwood operations. However, the plant can be said to be operating successfully because a production has been reached as high as 125 tons daily.



General View of the Fort William Paper Company's Plant.

Facilities for shipping have been carefully planned, and a dock has been laid down temporarily on the water frontage to take care of stock awaiting boat shipment down the Great Lakes.

Since the commencement of operations, two boats per month have shipped the greater part of the product to mills in Canada and the United States and the Company have built up a sound reputation for a high grade pulp.

Plans are completed and construction started to enable the plant to water all the wood required to take care of their operations for the coming year, most of which is being cut on their own limits.



Canadian Built Magazine Grinders.

The plant is situated on the property known as the Mission Terminal at Fort William, Ontario.

Officials of the Fort William Paper Company are as follows:—

President, Col. Thos. Gibson.

Vice-Presidents, Major P. B. Wilson, Col. C. H. L. Jones, G. R. Gray, Esq.

Secretary, J. G. Gibson.

General Superintendent and Chief Engineer, D. G. Calvert.

Recording Instruments Used In The Pulp and Paper Industry.

By L. G. BEAN, of the Bristol Company,
Waterbury, Conn.

The leading pulp and paper mills of this country have found that by the application of recording instruments to many processes they have been able to obtain a better and more uniform product with an improved plant efficiency. The great advantage of the recording instrument over the small indicating instrument lies primarily in the following two points:

1.—Recording Instruments furnish the operator of any process with an accurate guide as to at just what rate and to what extent the process is taking place.

2.—Recording Instruments furnish a fileable permanent record of the varying conditions which enter into the process and are a check in the hands of the management to see that the best operating conditions are maintained. The fact that one large paper plant has over a thousand of these recorders in actual operation is not at all surprising when a few of the many uses of these instruments are pointed out.

Recording instruments are applicable to practically all processes for the measurement and recording of pressure, temperature, humidity, speed, liquid level, motion, flow, time and electricity. These instruments are furnished in numerous forms and cases, but the type of instrument of most general use in pulp and paper mills for recording any of the above qualities is that as shown in Figures Nos. 1 and 2. This standard rectangular case made of cast iron is both moisture and fume proof, and when opened the entire simple mechanism is exposed to view and inspection. Charts are thus easily changed and this type of case offers the great advantage of the long pen arm which it is not possible to use in the so called "round form" models. To mention all of the uses to which these instruments are being put at present in the pulp and paper mills would be impossible, but the following give some of the more common applications to which they are adapted in the different types of paper plants.

In the mechanical pulp mills electric tachometers have been used to great advantage on the grinder shafts. Since the character of the pulp produced here depends largely on the speed of revolution of the stone and the pressure of the wood against the stone, the careful observation of the two components, speed and pressure, as given by recording tachometer and pressure gauge, will insure a most even quality of product, with the lowest consumption of power. One eastern paper plant has thirty-six of its grinders equipped in this manner with most efficient results. In the storage of bleaching liquor at these plants recording liquid level gauges equipped with an automatic bell alarm have been found to be a great asset. These same recorders are also often used in determining the amount of stock drawn off in any period of time, together with the rate of consumption.

In the Sulphite process recording instruments find a most varied application. Undoubtedly, the most important use here is in connection with the digesters. Each digester of any modern plant should be equipped with a recording pressure gauge and recording thermometer. The thermometers generally utilize a chart with a range of approximately 140 to 330 degrees Fahrenheit. Charts calibrated in degrees Centigrade, with about the corresponding range, have been used to considerable extent by many plants. The thermometer used here should be either of the so termed "Vapor tension type" or the "gas filled type". Mercury filled instruments are not well adapted to this use as they are frequently affected by temperature changes along the tubing connecting the sensitive bulb to the instrument. The sensitive bulb used with these instruments is generally constructed of copper and protected by a heavy cast bronze protection well which is inserted through the wall of the digester and held tight by means of a nut and washer on the outside of the digester. A fixture designed by the Bristol Company for this purpose has met with most



Fig. 1.

general approval in digester plants, in that it is easily installed and allows the sensitive bulb to be withdrawn for testing without interfering with the operation of the digester. Recording pressure gauges used on such apparatus are furnished with an oil seal filled with glycerine or some other non-active agent to prevent the fumes from the digester attacking the interior of the instrument.

A common method of operating digesters is for the operator to be furnished with charts which have been marked by means of a template of the curve showing the rate at which the temperature and pressure in the digester is to be raised. The operator then has only to make the red line of the instrument pen follow the pencil line drawn on the chart, and a uniform and proper cook will result. Such a method also prevents the burning of the chips, which often occurs if the process is carried too fast. Twelve-hour charts are often used in the "short cook" process with the consequent open time divisions, although the twenty-four hour charts are more satisfactory for most operations.

In the making of sulphurous acid SO_2, used in the Sulphite Plants, recorders are used to great advantage. The sulphur burners are generally equipped with recording pyrometers and the proper record on these instruments assures the superintendent that over-heating is not taking place, together with the attending sublimation. The most economical use of sulphur will result if the burning temperature is kept at the proper point

for correct combustion. The instruments used here are generally the combination indicators and recorders, and have a scale range of 2,000 degrees F. Recording thermometers are then used upon the cooler tanks and again in connection with the absorption apparatus together with recording vacuum gauges. These all help to assure the production of a most uniform quality of acid to be used in the digester.

In the Soda process the application of recorders is much the same as in the Sulphite plant except that on the digesters, steel fittings may be used instead of bronze for the thermometer bulbs. In the process of making caustic soda from sodium carbonate, the recording thermometers govern, to a considerable extent, the operation. Recording vacuum gauges together with thermometers also control the process through the evaporators and burners used in recovering the soda from the used liquor. All these thermometers are furnished with suitable charts and protection wells for their individual application.



Fig. 2.

The bleaching plant of any mills is another department in which recorders have been quite generally installed. In the first place, bleaching powder should be kept cool and dry, and this point is carefully watched by recorders. In the mixing, the temperature should not be allowed to exceed about 70 degrees F. and the resulting bleach will be stil better if this temperature is kept even lower. During the bleaching process itself, the chlorination of the fibre of the stock must be carefully watched out for, for if the stock runs much above 115 degrees F., this action is liable to take place in spots if not throughout, with its consequent danger. Recording Thermometers, the bulbs of which are in the stock, guard the operator against this trouble and tell him when his temperature is approaching the danger point.

In the beater room, recorders are used frequently to show the position of the rolls of the beaters and also at just what time their position was changed. This employs a mechanical time recorder of simple construction, which has been used with good results. Liquid level gauges are also used here considerably both on beaters and stuff chests and give, when used with a constant, an accurate measurement of the stock beaten or drawn off.

As applied to paper machines, recording thermometers are used to record the temperature existing in the drying rolls and pressure gauges give similar information with regards the pressure existing in the different sections of the machine. A contact thermocouple has also been used to good advantage in obtaining the actual surface temperatures of the calender rolls.

The speed of the paper through the machine has long been an important factor and this is best recorded by means of an electric tachometer, the magneto of which is attached to the spring roll of the machine. This gives an accurate record in feet per minute of the paper through the machine and will show clearly the time and interval during which the machine was down for a "break" or repairs. The electric tachometer recorder may be placed at any desired distance from its magneto fixture.

In the fine paper plants where the paper is treated with various sizes recording thermometers are utilized to keep this solution at its proper temperature and consistency. A similar use for recorders is found in plants making waxed papers. Fine papers when being seasoned are often subjected to very carefully regulated temperature and humidity conditions, and recording psychrometers are the best means of keeping the conditions under complete control as desired, while the paper is drying out.

There are many other uses in plants auxiliary to the ordinary paper mill to which recorders have been most profitably applied, but those mentioned are the more direct applications in the pulp and paper industry. Throughout the entire paper mill process, from the grinder rolls to the seasoning of fine papers, the Recording Instrument has come to play an important part. Ever on the watch, and never sleeping, these recorders serve as silent sentinels in their dual role of a guide for the operator and a check for the superintendent. That is why the recording instrument has been used so extensively in the pulp and paper industry.

The strength of a nation is in proportion to the number of its virtuaus homes, founded upon supreme affections.—*Joseph Cook.*



Mr. Alfred Pollack, of Pollack Bros. & Co., Montreal, one of the oldest dry-stuff firms in Canada, and with extensive connections with the Pulp and Paper Industry.

HOWARD SMITH PAPER MILLS, Limited,

Makers in Canada of High Grade Papers

Tub Sized
Loft Dried
Rag Bonds
& Ledgers

Sulphite
Bonds &
Ledgers



PAPER MACHINE IN BEAUHARNOIS PLANT

Banknote
Parchment
Vellum
Antique
Offset &
Text Book

Bristol Boards and Blotting Papers.

Mills at Beauharnois, Que. Crabtree Mills, Que. Cornwall, Ont.

Head Office: 138 McGill St., MONTREAL

Code: BENTLEYS
Cable Address: HOWARSMITH, MONTREAL.

Pulp and Paper Mills in Canada

The following list of pulp and paper mills in Canada, with production, etc. is compiled from correspondence and other available information.

BRITISH COLUMBIA.

Beaver Cove Lumber and Pulp Company, Ltd.

Head office 504 Standard Bank Bldg, Vancouver, B. C.

Mills, Beaver Cove, B.C. (Northeastern coast Vancouver Island.)

Officers, William H. White, president, W.O. King, vice-president and treasurer, George C. Pratt, secretary.

Production, Kraft pulp, 40 tons daily.

Pacific Mills, Limited.

General office, Standard Bank Bldg, Vancouver, B. C.

Mills, Ocean Falls, B. C.

Officers, A. B. Martin, president; William Pierce, Johnson and Louis Bloch, managing directors; J. H. Lawson, secretary; L. S. Burdon, mill manager; Wm. Sheahan, superintendeent.

Production, kraft paper, 30 tons daily, newsprint, 220 tons daily. Excess pulp production for sale, 20 tons kraft pulp..

Powell River, Company, Ltd.

Office, Standard Bank Bldg, Vancouver, B.C.

Mills, Powell River, B. C.

Officers, D. F. Brooks, president, J. Scanlon, vice-president, A. S. Brooks, treasurer, H. K. Brooks, Secretary, Norman R. Lang, managing director, A. E. McMaster, mill manager..

Cable address, Province, Vancouver, (Codes, Western Union, Universal Edition and Western Union, five-letter edition.)

Production, newsprint, 225 tons daily. Excess sulphite pulp above own requirements, 25 tons daily.

Western Canada Pulp and Paper Co., Ltd.

Offices, Canada Life Bldg, Vancouver, B. C. and 36 King St. East, Toronto.

Mills, Port Mellon, Howe Sound, B.C. (near Vancouver.)

Officers, H. J. Daley, president; A. H. Douglas, vice-president; T. S. O'Connor, secretary; R. S. Jamieson, treasurer; T. Iversen, superintendent.

Production, sulphate pulp, 40 tons daily.

Whalen Pulp and Paper Mills, Ltd.

Head office, Bank of Nova Scotia Bldg, Vancouver, B. C.



A "close-up" of some British Columbia pulpwood. The diameter of some of these logs will equal a man's height.

Mills, Woodfiber Bay, Howe Sound, B.C. Swanson Bay, B.C. Port Alice (Quatsino Sound, Vancouver Island) B. C.

Officers, T. W. McGarry, president.

Production, 110 tons strong sulphite pulp, 50 tons easy bleaching, 90 tons bleached.

MANITOBA.

Red River Pulp and Paper Mills, Ltd.

Head office, 233 Curry Bldg., Winnipeg.

Mill, Norwood, Man.

Officers, J. J. Kilgour, president; Douglas A. Clark,

vice-president, Fred. P.T. Gilroy, manager and treasurer. (New mill for paper boards and wrappers, not yet operating).

NOVA SCOTIA.

Cape Breton Pulp and Paper Company.

Head office, 200 Fifth Avenue, New York, U.S.
Mills, (Rossing Plant) Murray, Cape Breton, N. S.
Officers, Hugh J. Chisholm, president, F. A. Gordon, general manager; L. M. Bickford, vice-president; F.E. Tufts, treasurer.

Clarke Brothers, Limited.

Head Office, Bear River, N. S.
Mills, Bear River, N. S.
Officers, W.G. Clark, chairman and treasurer; W. W. Clarke, secretary; Andrew Bloc, superintendent.
Cable address, Clarke (Watkins or A. B. C. Code).
Production, sulphate pulp, 30 tons daily.



Rapid Falls Mill, MacLeod Pulp & Paper Co.

Clyde Pulp Company.

Head office, Halifax, N.S. (Becker and Co., of America, Ltd.)
Mills, Clyde River, Shelburne Co., N. S.
Officers, Becker and Co., of America, Limited. Halifax, Harry Mathers, managing director; Frank Ouellet, manager, A.C. Hatt, superintendent.
Production, groundwood pulp, 30 tons wet daily.

Gaspereau River Light, Heat Power Co.

Head Office, Wolfville, N. S.
Mills, White Rock, N. S.
Officers, C. H. Wright, president; R. A. Jodrey, secretary; John H. Hughes, superintendent.
Production, groundwood dry, 12 tons daily.

La Have Pulp Company, Limited.

Head office, New Haven, Conn., U. S.
Mills, Morgan Falls, New Germany, N. S.
Officers, Wm. R. Shaffer, president and treasurer; William E. Parnell, secretary.
Cable address, Morgan, (A. B. C. Code)
Production, groundwood pulp, 20 tons dry daily.

MacLeod Pulp & Paper Company, Ltd.

Head ofice, Liverpool, N.S.
Mills, Milton, N. S.
Officers, Frank J. D. Barnjum, president, S. H. Tessenden, secretary, J. R. Gordon, resident manager; I. W. Freeman, superintendent.
Production, groundwood pulp, 75 tons dry daily, (Formerly produced woodpulp, folding and colored boxboards, but paper mill was burned down in 1915.)

Nova Scotia Pulp and Paper Co., Ltd.

Head office, Bridgewater, N. S.
Mills, Charleston, N. S.
Officers, Frank K. Brown, president; J. C. A. Robertson, vice-president; A. F. Parmenter, secretary-treasurer; G. H. Pye, manager.
Production, groundwood pulp, 30 tons dry daily.

Sissiboo Pulp and Paper Company, Ltd.

Head office, Weymouth, N. S.
Mills, Weymouth Falls and Tidewater, N. S. (Idle)
Oficers, R. A. MacIntyre, secretary and treasurer; S. D. Jones, superintendent.
Production, groundwood pulp, 105 tons daily, controlled by Becker and Co.

St. Croix Paper Company, Ltd.

Head office, Halifax, N. S.
Mills, Hartville, Hants Co., N. S.
Officers, H. M. C. Hart.
Equipped to make 10 tons groundwood and 12 tons paper.
(Paper mill inactive).

NEW BRUNSWICK.

Bathurst Company Limited, Bathurst, N. B.

Head office, Bathurst.
Mills, Bathurst.
Officers, Angus McLean, president and general manager; A. E. McLean, vice-president and assistant general manager; M. E. Priesch, vice president and assistant secretary; S. B. Bond, secretary; Geo. A. Schryer, treasurer; Smith Morse, auditor.
Cable address, Wongan, Bathurst, N. B.



MR. ANGUS McLEAN,
President, Bathurst Company, Ltd.

Production, easy bleaching sulphite pulp, 50 tons daily; Kraft pulp, 50 tons daily.

Dominion Pulp Company, Limited, The

(see Fraser Companies, Chatham Mill.)
Head office, Edmunston, N. B.
Mills, Chatham, N. B.
Officers, same as Fraser Companies, Ltd.
Cable address, Dominion, Miramichi.
Production, unbleached sulphite pulp, and easy bleaching, 50 tons daily.
(This mill has been very recently purchased by Fraser Companies, Limited.)

Fraser Companies, Limited.

Head Office, Edmunston, N. B.
Mills, Edmunston and Chatham, N. B.
Officers, Archibald Fraser, president; Donald Fraser, vice-president; William Matheson, secretary; W. A. Brebner, treasurer; F. W. Brown, superintendent, Edmunston mill; W. G. Stevens, manager, Chatham mill.
Production, bleached sulphite fibre, 120 tons daily, unbleached 50 tons daily.

Nashwaak Pulp and Paper Company.

Head office, St. John, N.B.
Mills, Fairville, N.B.
Officers, H. J. Chisholm, president; C. A. Gordon, vice-president; J. H. Drummond, secrtary; F. E. Tufts, treasurer; N. M. Jones, general manager; Sydney M. Jones, local manager.
Cable address, Fibre.
Production, bleached sulphite pulp 75 tons daily.

New Brunswick Sulphate Fibre Company, Limited.

Head office, 138 McGill St. Montreal.
Mills, Millerton.
Officers. C. Howard Smith, president; Harold Crabtree, secretary.
(Mills, dismantled.)



The Abitibi mill is close to the big woods.

St. George Pulp and Paper Company.

Head office, So. Norwalk, Conn.
Mills, St. George, N. B.
Officers, N.H. Batsford, president; E.G. Murphy, vice-president, P. E. Barringer, secretary; L. E. Wolfe, treasurer.

Production, groundwood pulp 30 tons daily.

ONTARIO.

Abitibi Power & Paper Company, Limited.

Head office, Sun Life Building, Montreal, Quebec.
Mills, Iroquois Falls, Ontario.
Officers, F.H. Anson, president; Shirley Ogilvie and Alex Smith, vice-presidents, W.H. Smith, treasurer; L.R. Wilson, secretary, R.A. McInnis, manager.
Cable address, Hosa.
Production newsprint, 500 tons daily, groundwood 510 tons and sulphite pulp 135 tons daily.

Adams Cellboard Company, Limited. (Greenville Paper Mill, Formerly James Stutt & Sons Co.)

Head Office, P. Q. address, Greenville, Ontario.
Mills, West Flamboro, Ontario.
Officers, Chas. E. Colgrove, president, Robt. T. MacDonald, vice-president, Chas. E. Marriott, secretary-treasurer and superintendent.
Production, bogus chip and straw-board, 4 tons daily.



Sulphite mill, Port Arthur division, Provincial Paper Mills, Ltd.

Beaver Wood Fibre Company, Limited.

Head office, Thorold, Ontario,
Officers, Wm.F. MacGlashan, president: C.C. Jamieson, vice-president, H.N. Hiles, secretary, Truman J. Seitz treasurer, George Robertson, superintendent.
Cable address, Beaver, Buffalo.
Production, groundwood pulp, 190 tons daily; wall board 120 tons daily.

Belleville Paper Mills.

Head Office, Belleville, Ontario.
Mills, Belleville, Ont.
Officers, T. P. Birchall, president; J. O'Brien, manager; Wm. Ibey, superintendent.
Production, pure straw paper for corrugating purposes, 5 tons daily.

Booth, J. R.

Head Office, Ottawa, Ontario.
Mills, Ottawa, Ontario.
Officers, J. R. Booth, president; C. J. Booth, vice-president and treasurer; J. F. Booth, managing director; J. B. McGibbon, sales manager.
Cable Address, Booth.
Production, newsprint, 140 tons daily; board, 55 tons; groundwood 200 tons; sulphite 90 tons.

Bronson Company, The.

Head office, Ottawa, Ontario.
Mills, Ottawa, Ontario.
Officers, Frederic E. Bronson, president and managing director; H. Greene, secretary-treasurer.
Production, groundwood pulp, 26 tons daily.



Nipigon Fibre and Paper Mills, Ltd.

Cornwall Pulp and Paper Corp.

Mills, Cornwall, Ont.
Officers, James B. O'Brien, president; C.C. Hullinger, vice-president and treasurer; Fred Dobmeier, secretary; E. E. Emigh, superintendent.
Production, groundwood, 30 tons daily.

Don Valley Paper Company, Limited.

Head office, Dominion Bank Building, Toronto, Ont.
Mills, Don Valley, Toronto, Ontario.
Officers, J.G. Worts, president; W. Davies, vice-president: H. St. J. Jarvis, secretary and treasurer: C. Nelson Gain, superintendent.
Production, cover papers, postcard, bristols, poster, white and colored bristols, sulphites and manila envelope and tag, 10 tons daily.

Dryden Paper Company, Limited.

Head office, Dryden, Ontario.
Mills, Dryden, Ontario.
Officers, J.B. Beveridge, managing director, H. Humphreys, secretary-treasurer, F.N. Beveridge, general superintendent.
Cable address, Drypulp (W.U. Code)
Production, kraft pulp, 70 tons air dry daily, kraft sheathing paper, 15 tons; kraft wrapping papers, 15 tons.

Eastern Paper Company, Ltd.

Head office, St. Basile Station, Portneuf Co., Quebec.
Mills, St. Basile.
Officers, J. E. Pepin, president and treasurer; Mrs. E. R. Pepin, vice-president.
Production, carpet lining, sheathing, felt, tarred products, board, 15 tons daily.

Eddy, The E. B., Ltd.

Head office, Hull, Canada.
Mills, Hull, Canada.
Officers, George H. Millen, president and manager; J. T. Shirreff, vice-president; David Tilley, treasurer; John F. Taylor, secretary.
Cable address, Eddy, Hull, Canada.
Production, roll and ream news and white wrapping, 50 tons daily; plain folding board, single and duplex colored, lined folding board, white lined folding board and tag boards, 20 tons; manila, white and colored tissues, plain and crepe toilet papers, paper towelling and serviettes, 3 tons; book, litho and colored prints, posters and cover papers, writing manilas, white wove and laid writings, bristols and tickets, 8 tons; check book, paper, plain manila and fibre wrappings, grey and brown wrappings, striped, manila and Samson B. wrapping, 16 tons; bag, manila and mill wrapper, 8 tons. Excess pulp production over own requirements 8 to 10 tons daily Eddy's unbleached slow cooked sulphite pulp.

Fibre Board, Limited.

Head Office, Penentanguishene, Ontario.
Mills, Penetaguishene, Ontario.
Officers, Manley Chew, proprietor.
Production, wall board.

Fisher, John, and Son, Limited.

Head office, Dundas, Ont.
Mills, Dundas.
Production, hardware, manila, rope, wrapping, and wax papers 6 tons daily.

Ford, Rowland & Son.

Head office, Portneuf Station, Que.
Mills, Portneuf Que.
Officers, Rowland Ford, Sr., president; Rowland Ford, Jr., vice-president.
Production, roofing and carpet felt, sheathing, and dented sheathing for bottle wraps; 5 tons daily.
Head office, Portneuf, Quebec.



Temiskaming Pulp and Paper Co.

Ford, Joseph, and Company.

Officers, Joseph Ford, Jr.; Thomas Ford.

Production, hard size news, linings, hangings, colored poster, wrappings and bag papers, 13 tons daily.

Forest Products Laboratories Of Canada.

Head office, University Street, Montreal.

Officers, R.H. Campbell,director, Dominion Forestry Branch; W. W. Kynoch, superintendent.

Mill, University Street, Montreal.

Production, soda, sulphite and sulphate pulp and all kinds of paper in small quantities (Government experimental work only.)

Great Eastern Paper Company, Ltd.

Head office, 160 St. James St. Montreal.

Officers, John M. Mackie, president; F. Howard Wilson, vice-president; G.H. Davidson, secretary-treasurer.

Mills, Grand Falls, Madeleine River, Gaspe, Quebec.

Production, groundwood pulp, 65 tons daily.

Fort Frances Pulp and Paper Company, Limited.

Head office, Port Frances, Ontario.

Mills, Fort Frances, Ontario.

Officers, E.W. Backus, president, S.W. Backus, B. G. Dahlberg, and Albert Newcombe, vice-president; Wm. F. Brookes; treasurer, C. C. Honey, secretary.

Production, newsprint 150 tons daily, groundwood pulp,100 tons daily.

Fort William Paper Co., Limited.

Mills, Fort William,Ontario.

Officers, George H. Mead, chairman of the board, Col. Thomas Gibson, president, Percy B. Wilson, vice-president, Col. C.H.L. Jones, and Geo. R. Gray, vice-presidents; J.G. Gibson, secretary, W.L. Bird, treasurer.

Production, groundwood pulp, 120 tons daily.

Garden City Paper Mills Company, Limited.

Head office, St. Catherines, Ontario,

Mills, St. Catherines, Ont., Merrinton, Ont., and Thorold, Ont..

Officers, Lauren H. Gardner, president, R.E. Myers, vice-president, Chas. W. Syrett, secretary-treasurer.

Production, toilet,tissue and light-weight specialties, 9 tons daily.

Hinde and Dauch Paper Company of Canada, The

Head office, 43 Hanna Avenue, Toronto,Ont.,

Mills, Toronto, Ontario.

Officers, Sidney Frohman, president; Ralph King, vice-president; O.H. Moore, treasurer and manager; R.H. Ranney, secretary; T.W. Lloyd, assistant-secretary.



A large mill that makes only high grade sulphite bonds.

Production, jute and chip test container boards, fibre boxes, corrugated boxes and wall board, 50 tons.

Hydro-Electric Power Commission Pulp Mill.

Head office, 190 University Avenue, Toronto, Ont.

Mills, Campbellford, Ontario. Elie Brunelle, manager, L.A. Burbank, superintendent.

Production, groundwood pulp, 30 tons daily.

Howard Smith Paper Mills Ltd.

Head office, Montreal.

Mills, Cornwall, Ontario. (See under Quebec).

Interlake Tissue Mills, Limited.

Head Office, Toronto, Ontario.

Mills, Merritton, Ont.

Officers, George Carruthers, president; I. H. Weldon, vice-president; S. F. Duncan, secretary.

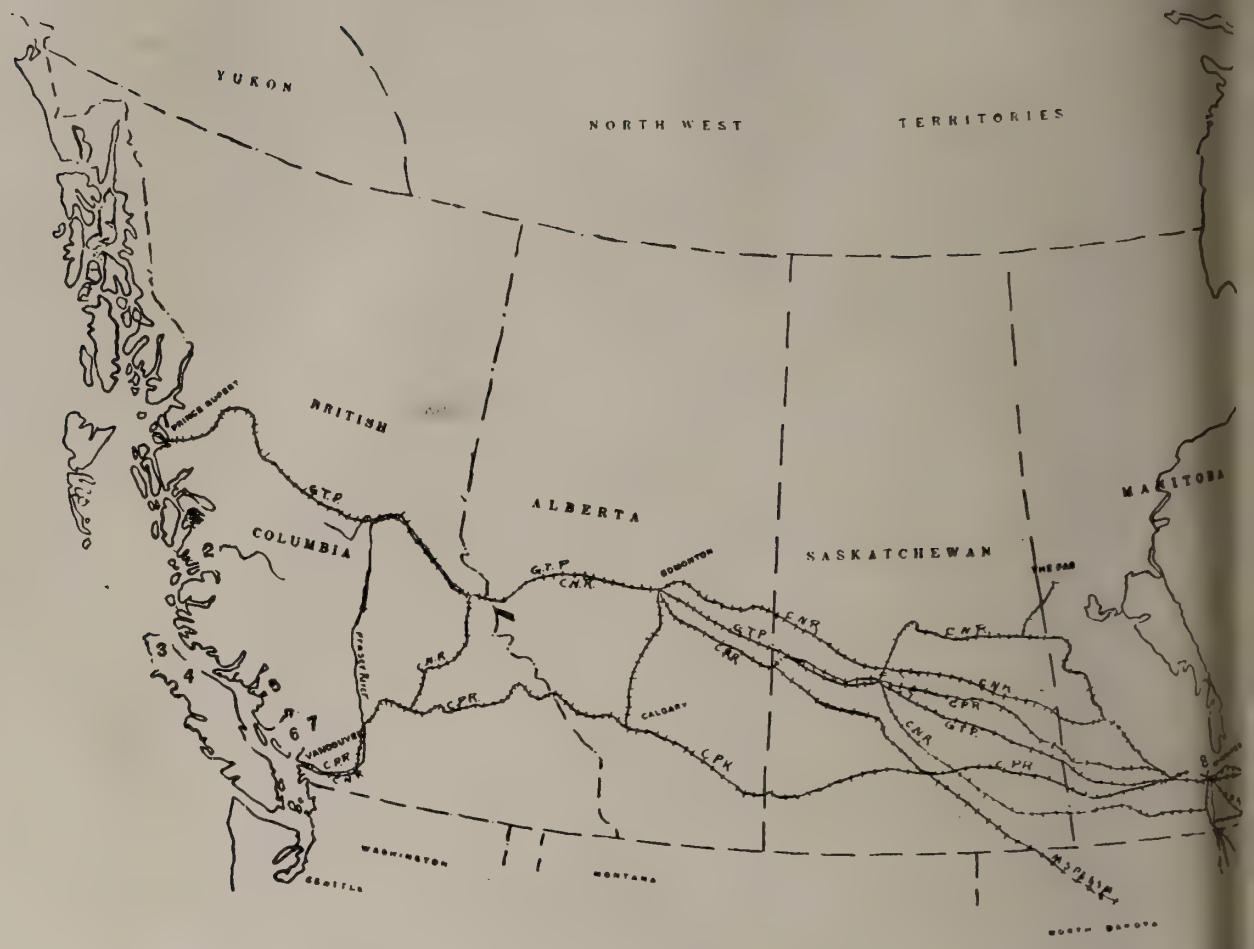
Cable Address, Interlake, Toronto, Canada.

Production, white and colored M. G. tissues, M. F. catalogue, news, book and wrapping, brown and colored light weight M. G. Kraft, white and colored drug



Cornwall division, Howard Smith Paper Mills, Ltd.

Pulp and Paper



The following is an index to the map. Further details regarding individual concerns are given on pages 123-134.

British Columbia:—

1.—Whalen Pulp and Paper Mills, Ltd. Swanson Bay.
2.—Pacific Mills, Ltd., Ocean Falls.
3.—Whalen Pulp & Paper Mills, Ltd., Port Alice, Quatsino Sound.
4.—Beaver Cove Pulp & Lumber Co., Ltd., Beaver Cove.
5.—Powell River Co., Ltd., Powell River.
6.—Western Canada Pulp & Paper Co,. Ltd., Port Mellon, Howe Sound.
7.—Whalen Pulp & Paper Mills, Ltd., Woodfibre, Howe Sound.

Manitoba:—

8.—Red River Pulp & Paper Co., Norwood.

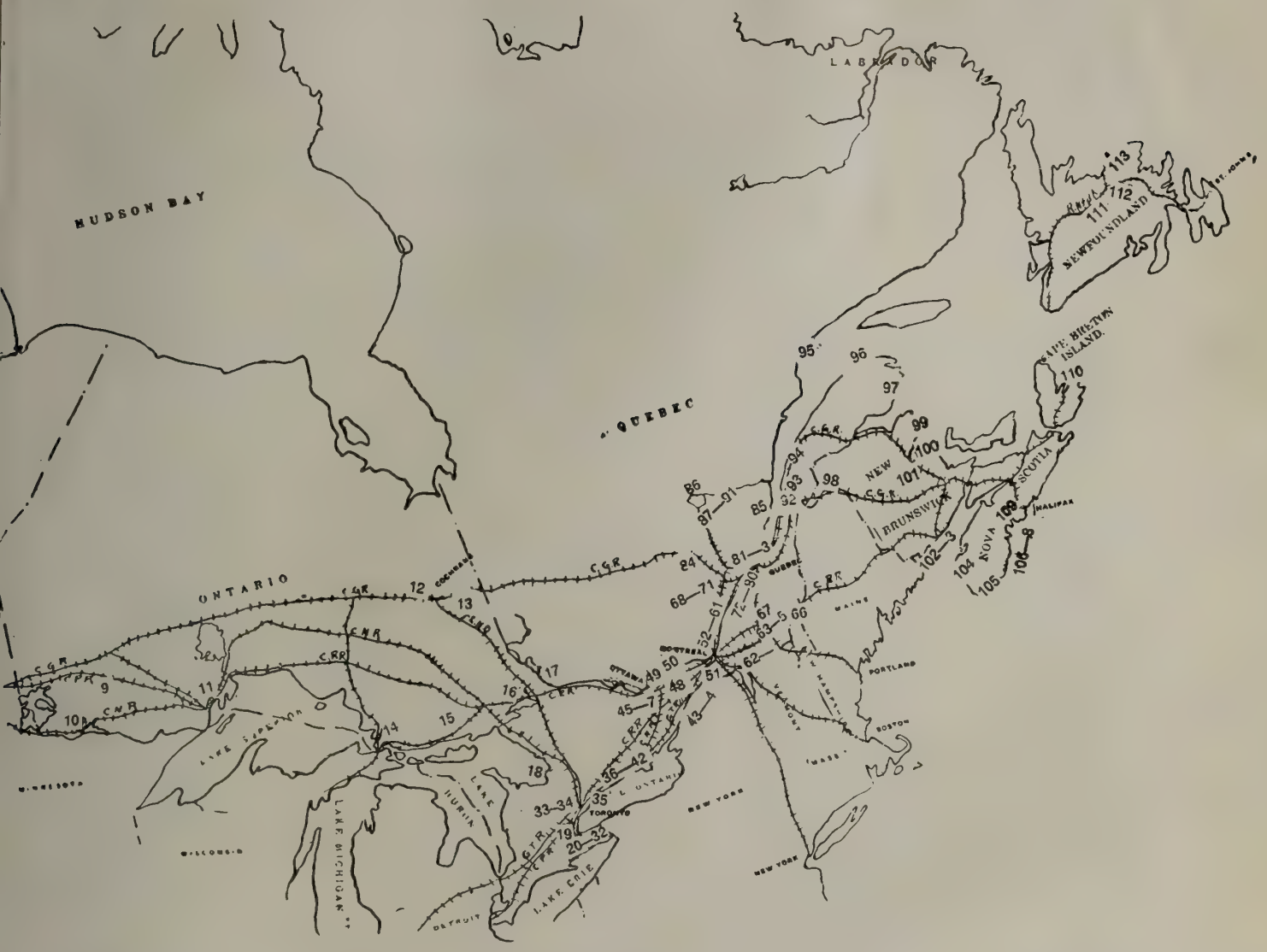
Ontario:—

9.—Dryden Paper Co., Ltd., Dryden.
10.—Fort Frances Pulp & Paper Co., Ltd., Fort Frances.
11.—Provincial Paper Mills, Ltd., Port Arthur.
11a.—Fort William Paper Co., Ltd., Fort William.
11b.—Kaministiqua Pulp & Paper Co., Port Arthur.
11c.—Nipigon Fibre Co., Nipigon.
12.—Mattagami Pulp & Paper Co., Ltd., Smooth Rock Falls.
12a.—Spruce Falls Pulp & Paper Co., Kapuskasing.
13.—Abitibi Power & Paper Co., Ltd., Iroquois Falls.
14.—Spanish River Pulp & Paper Mills Ltd., Sault Ste. Marie.
15.—Spanish River Pulp & Paper Mills Ltd., Espanola.
16.—Spanish River Pulp & Paper Co., Ltd., Sturgeon Falls.
17.—Riordon Co., Ltd., Temiskaming, Que.
18.—Fibre Board, Ltd., Penetanguishene.
19.—Fisher, John, & Son, Ltd., Dundas.
20.—Adams Cellboard Co., West Flamboro.
21.—Kinleith Paper Mills, Ltd., St. Catharines.
22.—Garden City Paper Mills Co., Ltd., Ste. Catharines.
23.—Lincoln Paper Mills Co., Ltd., Ste. Catharines.
24.—Lincoln Paper Mills Co., Ltd., Merritton.
25.—Riordon Co., Ltd., Merritton.
26.—Interlake Tissue Mills., Ltd., Merritton.
27.—Provincial Paper Mills, Ltd., Thorold.
28.—Ontario Paper Co., Ltd., Thorold.
29.—Thorold Pulp Co., Ltd., Thorold.
30.—Beaver Wood Fibre Co., Ltd., Thorold.
31.—Peerless Pulp Co., Ltd. (burned).
32.—Beaver Wood Fibre Co., Ltd., Thorold (Pulp Mill).
33.—Provincial Paper Mills Co., Ltd., Georgetown.
34.—Don Valley Paper Co., Ltd., Toronto.
35.—Hinde & Dauch Paper Co., of Canada Ltd., Toronto.
36.—Hydro-electric Power Commission, Campbellford.
37.—Canadian Paperboard Co., Ltd., Campbellford.
38.—Miller Bros. Co., Ltd., Glen Miller
39.—Canadian Paperboard Co., Ltd., Frankford.
40.—Belleville Paper Mills, Ltd., Belleville.
41.—Strathcona Paper Co., Ltd., Strathcona.
42.—Specialty Paper Co., Camden East
43.—Provincial Paper Mills Co., Ltd., Mille Roches.
44.—Howard Smith Paper Mills, Ltd., Cornwall.
44a.—Cornwall Pulp & Paper Co., Cornwall.
45.—Beaver Board Co., Ltd., Ottawa (mill at Deschenes, Que., transferred to Thorold).
46.—J. R. Booth, Ottawa.
47.—Bronson, Limited, Ottawa.
48.—Riordon Co., Ltd., Hawkesbury.

Quebec:—

49.—Eddy, The E. B., Co., Ltd., Hull
50.—Maclaren, James, Co., Ltd., Buckingham.
51.—Howard Smith Paper Mills, Ltd Beauharnois.
52.—Wilson, J. C., Co., Ltd., Lachute Mills.
53.—Forest Products Laboratories o Canada, Montreal.
54.—Walker, J. R. & Co., Ltd., Saul au Recollet. (Montreal).
55.—Canadian Paperboard Co., Ltd Montreal.
56.—Howard Smith Paper Mills, Ltd. Crabtree Mills.

Mills in Canada



57.—McArthur, Alex. & Co., Ltd., Joliette.
58.—Wilson, J. C., Ltd., St. Jerome.
59.—Rolland Paper Co., Ltd., St. Jerome.
60.—Rolland Paper Co., Ltd., Mont Rolland.
61.—Bennett, Ltd., Chambly Canton.
62.—Dominion Paper Co., Ltd., Kingsey Falls.
63.—Canada Paper Co., Ltd., (2 mills). Windsor Mills.
64.—Brompton Pulp & Paper Co., Ltd., Bromptonville.
65.—Brompton Pulp & Paper Co., Ltd., East Angus.
66.—Lake Megantic Pulp Co., Ltd., Lake Megantic.
67.—Lotbiniere Lumber Co., Ltd., Nicolet Falls.
68.—Laurentide Co., Ltd., Grand'Mere.
69.—Belgian Industrial Company, Ltd., Shawinigan Falls.
70.—Wayagamack Pulp & Paper Co., Ltd., Three Rivers.
71.—St. Maurice Paper Co., Ltd., Cap Magdeleine.
71a.—International Paper Co., Three Rivers.
72.—Ford, Rowland & Son, Portneuf Station.
73.—Montreal Paper Co., Ltd., St. Basile.
74, 75.—Ford, Joseph & Co., Portneuf.
76.—Ruberoid Mfg. C., Portneuf.
77.—Eastern Paper Co., Ltd., St. Basile.
78.—Bird & Son, Pont Rouge.
79.—Donnacona Paper Co., Ltd., Pont Rouge.
80.—Donnacona Paper Co., Ltd., Donnacona.
81.—News Pulp & Paper Co., Ltd., St. Raymond.
82.—Richard & Co., L'Ange Gardien.
82a.—H. Atkinson, Reg'd., Pont Etchemin, P. Q.
83.—Richard & Co., Les Saules.
84.—Brown Corporation, La Tuque.
85.—Donahue Pulp & Paper Co., Ltd., Murray Bay.
86.—Quebec & Saguenay Pulp Co., Ltd., (formerly Peribonka Co., Ltd.), St. Amedee de Peribonka.
87.—Compagnie de Pulpe de Chicoutimi, Val Jalbert.
88.—Price Bros. Co., Ltd., Jonquieres.
89.—Price Bros., Co., Ltd., Kenogami.
90.—Compagnie de Pulpe de Chicoutimi, Chicoutimi.
91.—Ha! Ha! Bay Sulphite Co., Ltd., Bagotville.
92.—Soucy, F. Florentine, St. Antonin.
93.—Wolf River Pulp & Paper Co., Ltd., Fraserville.
94.—Price Bros. Co., Ltd., Rimouski.
95.—Gulf Pulp & Paper Co., Ltd., Clarke City.
96.—Great Eastern Paper Co., River Madeleine.
97.—St. Lawrence Pulp & Lumber Co., Chandler.

New Brunswick:—

98.—Fraser Companies, Ltd., Edmunston.
99.—Bathurst Co., Ltd., Bathurst.
100.—Fraser Companies, Ltd., Chatham.
101.—New Brunswick Sulphate Fibre Co., Ltd., Millerton.
102.—Nashwaak Pulp & Paper Co., Ltd., St John.
103.—St. George Pulp & Paper Co., Ltd. St. George.

Nova Scotia:—

104.—Sissiboo Pulp & Paper Co., Weymouth.
105.—Clyde River Pulp & Paper Co., Ltd., Clyde River.
106.—MacLeod Pulp & Paper Co., Milton.
107.—Medway Pulp & Power Co. (successor to Nova Scotia Wood Pulp & Paper Co., Ltd.) Mill Village.
108.—La Have Pulp Co., Ltd., (New Haven Pulp & Board Co., Ltd.,) New Germany.
109.—St. Croix Paper Co., Ltd., Hartville.

Cape Breton Island:—

110.—Cape Breton Pulp Co., St. Ann.

Newfoundland:—

111.—Anglo-Newfoundland Development Co., Ltd., Grand Falls.
112.—Reed, Albert E. & Co., Ltd., Bishop's Falls.
113.—Harwood Lumber Co., Limited, Campbelltown.

towels, nepkins, decorative crepe rolls, lunch and outing sets 25 tons daily.

Kamistiquia Pulp and Paper Co. Ltd.

Mills, Port Arthur, Ont.
Production, groundwood pulp, 35 tons daily.

Kinleith Paper Mills Ltd.

Head Office, St. Catherines, Ont.
Mills, St. Catherines, Ont.
Officers, H. F. E. Kent, president and managing director, H. H. Love, vice-president; G. H. Jefferson, secretary, A. G. Parker, teasurer; W. A. Anderson, superintendent.
Cable address, Kinleith, St. Catherines, Ont.
Production, book and writing, 20 tons daily.



MR. J. A. BOTHWELL

Lincoln Paper Mills Ltd.

Head Office, Merritton, Ont.
Mills, Merritton, Ont., and St. Catherines, Ont.
Officers, A. S. Woodruff, president; T. A. Woodruff, vice-president; P. Mitchell, secretary, J. R. Leslie, treasurer E. L. Kinzey, superintendent, paper mills; C. J. Armbruster, superintendent, pulp mill.
Production, Manila fibre, jute, kraft, greaseproof and glassine, 25 tons daily; rope, manila and wrapping, 10 tons; special extra strong sulphite, 50 tons.

Mattagami Pulp and Paper Company Ltd.

Head Office, Dominion Bank Bldg, Toronto.
Mills, Smooth Rock Falls, Ont.,
Officers, Duncan Chisholm, president, E. P. Shove, vice-presdent, S. R. Armstrong, vice-president, Fred. C. Clarke, secretary-treasurer, J. T. Moynihan, general manager.

Miller Brothers Company, Limited,The

Mills, Glen Miller, Hastings County, Ontario.
Officers, William T. Miller, president; J. R. Walker, vice-president; M. Campbell, secretary-treasurer, P. Miller, mill manager.
Head office, 30-38 Dowd Street, Montreal.
Cable address, Glen Miller, Montreal.

Nipigon Fibre and Paper Mills, Ltd.

Mills, Nipigon, Ont.
Officers, Col. James A. Little, president; M. D. McAlpin, vice-president, Jacob Seibert, secretary-treasurer, O. J. Plude superintendent.
Production groundwood pulp, 70 tons daily.

Ontario Paper Company, Limited,The

Head office, Thorold, Ontario.
Mills, Thorold, Ontario.
Officers, Warren Curtis, Jr., president and manager; R. R. McCormick, vicee-president and treasurer; E.H. Huntington, secretary, John F. Ryan, superintendent.
Production, newsprint, 90 tons daily; groundwood 225 tons, sulphite pulp 80 tons.

Port Arthur Pulp and Paper Company, Ltd.

(See Provincial Paper Mills Co.)

Provincial Paper Mills Company, Ltd.

Head office, Toronto, Ontario.
Mills, Thorold, Ontario; Mille Roches, Ontario; Georgetown, Ontario, and Port Arthur, Ontario.
Officers: I. H. Weldón, president, T. A. Weldon, vice-president, S. F. Duncan, secretary-treasurer.
Cable address, Provincial, Toronto, Ontario.
Production, coated paper and boards, 10 tons daily, books, envelope, cover, poster, lithograph, writing and catalogs, 70 tons daily; sulphite pulp, 50 tons daily; soda pulp, 6 tons daily.



MR. GEO. H. MILLEN

Spanish River Pulp and Paper Mills, Limited, The

Head office, Sault Ste Marie, Ontario.
Mills, Sault Ste. Marie, Ont., Espanola, Ont., Sturgeon Falls, Ont.
Officers, George H. Mead, president; P. B. Wilson,

vice-president; T. Gibson, secretary, A. H. Chitty, treasurer; C. H. L. Jones, manager; C. R. Gray, woods manager.

Cable address, Spanriv. Sault Ste. Marie, Ontario.

Production, newsprint 670 tons daily; groundwood pulp, 570 tons; sulphite pulp 215 tons; wood board pulp, 35 tons.



MR. S. F. DUNCAN.

Speciality Paper Mills.

Head office, Camden East, Ont.

Mils, Camden East.

Officers, Geo. C. Comfort, president and treasurer, Chas. B. Wing, 1st vice-president, Lewis F. Houpt, 2nd vice-president; Wilbur E. Houpt, secretary.

Production, light weight specialties, 12 tons daily.

Spruce Falls Co. Ltd.

Head office, Neenah, Wis.

Mills. Kapuskasing, Ontario.

Officers, F.J. Sensenbrenner, president; S.A. Mundy, 1st vice-president, Ernst Mahler, 2nd vice-president, J.C. Kimberly, secretary; Harry Price, treasurer.

Production, sulphite pulp, 120 tons daily, (Construction of mill suspended.)

Strathcona Paper Company, The

Head office, Strathcona, Ont.

Mills, Strathcona, Ont.

Production, wood board, straw board and egg case fillers, 24 tons daily.

Temiskaming Pulp And Paper Company, Limited.

Head office, Excelsior Life Bldg, Toronto.

Mills, Haileybury, Ontario.

Oficers, Alex. Fasken, president; J. H. Black, vice-president; C.C. Calvin, secretary-treasurer.

Production, groundwood pulp, 40 tons daily, (Mill under construction.)

Thorold Pulp Co. Ltd. The

Head office, Warsaw, N. Y.

Mills, Thorold, Ont.

Officers, Elmer E. Rowe, president; Bertha B. Rowe, vice-president; Avis E. Rowe, secretary; John B. Rowe, treasurer, James F. Wilson, superintendent.

Production, groundwood pulp, 8 tons daily.

QUEBEC

Atkinson, Henry, Registered.

Head office, Pont Etchemin, Quebec.

Mills, Pont Etchemin, Quebec.

Officers, Donald C.H. Atkinson, manager; W.S. Atkinson, superintendent.

Production, groundwood pulp, 12 tons, dry daily.

Belgian Industrial Company, Ltd.

Business office, Shawinigan Falls, Quebec.

Mills, Shawinigan Falls, Quebec.

Officers, H. Biermans, general manager; John Stadler, assistant manager;

Production, groundwood pulp, 270 tons daily, sulphite pulp, 90 tons; newsprint, 205 tons.

Bennett, Limited.

Head office, Chambly Canton, Quebec.

Mills, Chambly Canton, Quebec.

Officers, F. E. Norton, president; Geo. F. Davis, vice-president; Perry Warrington, teasurer; H. E. Walker; secretary; Frank E. Norton, superintendent.

Production, binders, counter, fibre and shoe boards, 12 tons daily.



F. A. SABBATON.

Bird and Son Ltd.

Head office, Hamilton, Ontario.

Mills, Pont Rouge, Quebec.

Officers, P. R. Allan, president; W. R. McNeil, and C. P. Cowan, vice-president; H. E. Davenport, secretary-treasurer; W. A. Parke, superintendent.

Cable address, Waterproof.

Production, felt for prepared roofing, 25 tons daily.

Brown Corporation.

Head office, 404 Commercial Street, Portland, Me.
Mills, La Tuque, Quebec.

Officers H. J. Brown, president; O. B. Brown, secretary and treasurer; W. R. Brown, assistant treasurer; D. P. Brown, local manager.

Production, sulphate kraft pulp, 130 tons daily.

Brompton Pulp and Paper Company, Ltd.

Head office, East Angus, Quebec.
Mills, East Angus and Bromptonville, Quebec.
Officers, F. N. McCrea, president; H. W. Beauclerk, vice-president; W. N. Monroe, treasurer; W. S. Hecks, secretary, J. A. Bothwell, general manager.
Production, newsprint, 70 tons daily; groundwood pulp dry, 314 tons; boxboard, 70 tons; sulphate pulp; 90 tons; kraft paper, 60 tons.



MR. D. F. ROBERTSON.

Canadian Paperboard Company, Limited.

Head office, 2 Seigneurs St. Montreal.
Mills, Campbellford and Frankford, Ontario, and Montral, P.Q.

Officers, J.G.G. Kerry, president; J.R. Walker, vice-president; David F. Robertson, general manager; Chas. E. Whitten, secretary-treasurer.

Production, groundwood, 20 tons daily; all kinds of paperboards, pulpboards, strawboards, container board, white-lined board, etc., 125 tons daily.

Canada Paper Company, Ltd

Head office, Windsor Mills, Quebec.
Mills, Windsor Mills, Quebec.

Officers, F. J. Campbell, general manager, H. B. Donovan, sales manager; H. M. Thorne, secretary-treasurer.

Cable address, Candaper.

Production, newsprint, 40 tons daily; bag and fibre, 15 tons; colors and specialties, 15 tons; groundwood; 40 tons; sulphate soda, 20 tons.

Chicoutimi Pulp Company.

Head office, Chicoutimi, Quebec.
Mills, Chandler, Quebec; Chicoutimi, Quebec; Val Jalbert, Quebec.

Officers, Hon. F. L. Beique, president, J. E. A. Dubuc, vice-president; J. E. Houseman, general manager; A. Bechard, treasurer; Roy Belleau, secretary, Edward Lavoie, superintendent.

Cable address, Chicoubeck.

Production, Candler mill, sulphite, 120 tons daily; Chicoutimi mill, groundwood, 400 tons; Val Jalbert mill, groundwood, 120 tons.

Dominion Paper Company.

Head office, 345 St. James Street, Montreal.
Mills, Kingsey Falls, Quebec.
Officers, Robert Currie, president and general manager; T. S. Currie and Wm. Currie, directors; P. Keene, secretary-treasurer.
Production, grey brown and manila kraft, fibre bag manila, 15 tons daily; sulphate pulp 6 tons; groundwood pulp, 7 tons.

Donohue Bros. Reg'd.
(Formerly Nairn Falls Pulp & Paper Co.)

Head office, Murray Bay, Quebec.
Mills, Murray Bay, Quebec.
Officers, J.T. Donohue, president; Chas. Donohue, managing director; J.O. Dugay, secretary, treasurer and superintendent.
Cable address, Nairnapulp, Murry Bay.

Donnacona Paper Company, Ltd. The

Head office, Donnacona, Quebec.
Mills, Donnacona, and Pont Rouge, Quebec.
Officers, Harry P. Gould, president; F. K. Kernan, vice-president; Chas. B. Rogers, secretary-treasurer; George M. McKee, general manager; W. M. Dickinson, superintendent.
Production, newsprint, 100 tons daily; sulphite, 50 tons, groundwood, 125 tons.

Gulf Pulp and Paper Company.

Head office, 85 St. Peter St. Quebec,
Mills,Clark City, Quebec.
Officers, F.W. Clark,president; J. Alex. Cameron, secretary; P.L. Collier, superintendent.
Cable address, North Shore, Quebec.
Production, groundwood pulp, 150 tons daily.

Ha! Ha! Bay Sulphite Company, Ltd. The

Head office, Port Alfred, Quebec.
Mills, Port Alfred, Quebec.
Officers, F. Becker, president; J.E.A. Dubuc, vice-president; G. F. Wilson, secretary; A. Wagner, treasurer; E. Bergeson. superintendent.
Production, sulphite pulp, 125 tons dry daily.

International Paper Company.

Head office, 30 Broad Street, New York.

Mills, Three Rivers, Quebec.

Officers, Philip T. Dodge, president; Ogden Mills; vice-president, C. W. Lyman, vice-president; Owen Shepherd, treasurer; F.G. Simons, secretary.

Production - Company is now erecting 80-ton sulphite plant and 200-ton paper mill for newsprint, nearly ready to produce. Present production 55 tons sulphite pulp. (This company operates 31 mills in the United States, producing 1788 tons of groundwood and 502 tons of sulphite daily. It controls extensive pulpwood limits in Canada.)

Lake Megantic Pulp Company.

Head office, Lake Megantic, Quebec.

Mills, Lake Megantic, Quebec.

Officers, George M. Stearns, president; W.D. Russell, treasurer; G.M. Stearns, secretary and superintendent.

Production, groundwood pulp, 15 tons daily.

Laurentide Company, Limited.

Head office, Grand'Mere, Quebec.

Mills, Grand'Mere, Quebec.

Officers, George Cahoon, Jr., president and manager; Charles R. Hosmer, vice-president; Louis Armstrong, treasurer; W. F. Robinson, secretary; J. O. Mason, superintendent.

Cable address, Laurentide, Grand'Mere.

Production, newsprint, 350 tons daily; pulpboards,

McArthur, Alex. and Company.

125 tons; sulphite, 175 tons; groundwood, 375 tons.

Head office 82 McGill Street, Montreal.

Mills, Joliette, Quebec.

Officers, D. F. Munn, president; J. M. G. Lockerby, vice-president; E. J. Rowland, secretary-treasurer.

Production, building paper, wall paper and various wrappings and colored papers, 25 tons daily.

MacLaren, James, Company, Limited,The

Head office, Buckingham, Quebec.

Mills, Buckingham, Quebec.

Officers, Albert Maclaren, president; Alexander Maclaren, vice-president; R.M. Kenny, general manager A.O. Anderson, secretary.

Cable address, Buckingham, Quebec.

Production, groundwood pulp, 75 tons daily.

Montreal Paper Company, Limited.

Head office, Portneuf Station, Quebec.

Mils, Portneuf, Quebec.

Officers, T.P. Bishop, president; L.P. Bishop, vice-president; Ernest Bishop, secretary-treasurer; Alfred Bishop, superintendent.

Production, roofing felt, 19 tons daily.

News Pulp and Paper Company, Limited.

Head office, 263 St. James Street, Montreal, Quebec.

Mills, St. Raymond, Quebec.

Officers, Frank Powell, manager; H.H. McArthur, secretary and treasurer.

Production, news, 30 tons daily, groundwood, 40 tons.

Price Brothers and Company, Limited.

Head office, Quebec.

Mills, Kenogami, P.Q.; Jonquiere, P.Q.; Rimouski, P. Q.

Officers, Sir William Price, president; J.M. McCarthy, vice-president;Geo. H. Thompson, vice-president; J. Leonard Apedaile, managing director; H.E. Price, secretary-treasurer.

Cable address, Price.

Production, newsprint 275 tons daily; mill wrappers and wall board, 70 tons; sulphite, 145 tons; groundwood,385 tons.

Price Porritt Pulp and Paper Co. (Subsidiary of Price Bros & Co.)

Mills, Rimouski; Que. P.Q. address, Beausejour, Que.

Production, groundwood pulp, 42 tons daily.

Quebec and Saguenay Pulp Company.

Head office, 58 Palace Hill, Quebec, Que.,

Mills, St. Amedee, d'Peribonka, Que.

Officers, Dr. M.J. Mooney, president; W.T. Robinson, vice-president; L.A. Fralick, superintendent.

Production, groundwood,, 30 tons daily.



SIR. WILLIAM PRICE

Riordon Company, Limited.

Head office, 367 Beaver Hall Square, Montreal.

Mills, Hawkesbury, Ont., Merritton, Ont., Temiskaming, Que.

Officers: C. Riordon, Honorary president; Carl Riordon, president and managing director; T. E. Warr vice president and mercantile director; Gen. J. B. White, vice-president and timber director; I. W. Killam, vice-president; F. B. Whittet, secretary-treasurer.

Production, bleached sulphite fibre, 335 and easy bleaching, 30 tons daily.

Richard and Company.

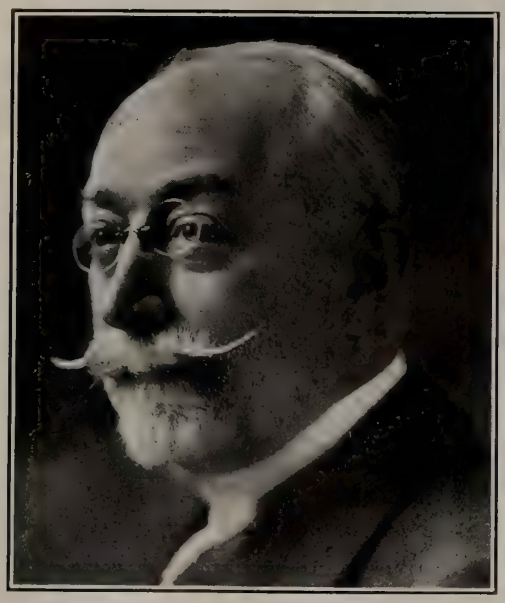
Head office, 161 Arago Street, Quebec, Que.

Mills, L'Ange Gardien and Les Saules, Que.

Officers, Louis Richard, manager and superintendent.
Production, leather, counter, friction and fibre board, 6 tons daily.

Rolland Paper Company, Limited.The

Head office, 142 St. Paul Street West, Montreal.
Mills, St. Jerome, Que., Mont Rolland, Que.
Officers, S.J.B. Rolland, president; J.P. Rolland,



MR. S. J. B. ROLLAND

vice-president ; Jean Rolland, general manager, St. Jerome; Oliver Rolland, manager, Mont Rolland.
Cable address, Rolland, Montreal (A.B.C. Code, Fifth Edition.)
Production, bond ledger, linen, wedding, papeterie, writing, book, 27 tons daily.

Ru-ber-oid Felt Manufacturing Company, Ltd.

Head office, Montreal, Quebec.
Mills, Portneuf, Quebec.
Officers, M. Drecier, H. S. Gillespie, vice-president; F. Jellenik, secretary-treasurer; Herbert Kennedy, manager.
Cable address, Montreal.
Production, roofing, carpet and building felt, 15 tons daily.

St. Maurice Paper Company, Limited.

Head office, Board of Trade Building, Montreal.
Mills, Cap de la Madeleine, Near Three Rivers, Que.
Officers M.B. Wallace, president, Alexander MacLaren, vice-president and general manager; C.R. McMillen and E. B. Murray, vice-presidents; E. S. Coleman, secretary-treasuheh.
Cable address, Charlemagne, Montreal.

Production, groundwood pulp, 200 tons daily; sulphite pulp, 60 tons; kraft pulp, 60 tons; newsprint, 110 tons.

Smith, Howard, Paper Mills, Limited.

Head office, 138 McGill Street, Montreal.
Mills, Beauharnois, Quebec; Crabtree Mills, Quebec; Cornwall, Ontario.
Officers, C. Howard Smith, president and managing director, Jas. W.Pyke, vice-president; Harold Crabtree, secretary; E.H. Smith, treasurer;
Production, Beauharnois Mill(D. Crabtree superintendent) loft dried,tub-sized paper and bristols 25 tons daily; Crabtree Mills (Kay Crabtree, superintendent), sulphite bonds, writing and litho papers, 45 tons daily; Cornwall, Ont., Mill (Wesley Tilton, superintendent) book, writing, envelope, blotting, litho,bond, ledgers, cover papers, 40 tons daily, also 80 tons bleached sulphite pulp daily.

Soucy. F. Flo.

Head office, Old Lake Road, Quebec.
Mills, Old Lake Road, Quebec.
Officers, F. Flo. Soucy, J. F. Soucy.
Production, groundwood pulp, 15 tons dry daily. (Production controlled by Thorold Pulp Co.)

Walker, J. R. and Company, Limited.

Head office, Montreal.
Mills, Montreal (Sault au Recollet.)
Officers, J.R. Walker, president; W. Earle Walker, vice-president and treasurer; H.E. Walker, secretary.
Cable address, Reklaw.
Production, saturating felt and sheathing paper, 10 tons daily; fibre, friction and trunk boards, 2 tons.

Wayagamack Pulp and Paper Company, Limited.

Head office, Three Rivers, Quebec.
Mills, Three Rivers, Quebec.
Officers, C.R. Whitehead, president and general manager; J.W. Pyke, vice-president; E.L. Wilson, secretary; D.L. Adams, treasurer; F.I. Ritchie, manager; R. Collins, general superintendent.
Cable address, Wagamack, Three Rivers, Quebec.
Production, sulphate kraft pulp, 200 tons daily, kraft paper (glazed and unglazed) 200 tons.

Wilson, J. C., Limited.

Head office, 61 St. Alexander Street, Montreal, Que.
Mills Lachute, Que., and St. Jerome, Quebec.
Officers, F. Howard Wilson, president; Edwin H. Wilson, vice-president; E.A. Deneg, secretary-treasurer
Production, manila and brown wrapping, toilet tissues and bag manilas, 50 tons daily; groundwood pulp, 15 tons daily.

Wolf River Pulp and Paper Company, Limited.

Head office, Riviere du Loup, Quebec.
Mills, Riviere du Loup, Quebec.
Officers, W.W. Moss, president; F.H. Barclay, vice-president; A.A. Magee, secretary; R.W. Moore, treasurer; F.O. Audette, superintendent.
Production, groundwood pulp, 40 tons daily.

The Capital Wire cloth and Manufacturing Co. of Ottawa have increased their capacity from two looms in 1912 to eighteen in 1921, with two more under construction. Along with growth in number, there has been a marked increase in the width of looms, as Fourdrinier wires are now woven well over two hundred inches wide. Mr. J. R. Buchanan, president and manager of the Company has been connected with the industry for more than 25 years. His grandfather wove the first Fourdrinier wire made in America, in 1848.

Prominent Personalities.

GEORGE F. STEELE.

Mr. G. F. Steele was born in Watertown, Massachusetts, October 16th, 1858. His father, the Reverend George M. Steele, was at that time a Methodist Minister, and later for thirty years entered the educational field being conected with colleges and schools at Appleton, Wis., Wilbraham and Auburndale, Mass. He was a deep student of economic problems and the author of several works on political economy and moral science. His mother came from a hardy race of seafaring men on Cape Cod and was a woman of great executive ability and power.



MR. STEELE.

Mr. Steele was educated in the public schools and the college at Appleton, Wis., graduating from the latter in 1878. In August, 1879, he entered the employ of the Van Nortwick interests at Appleton, Wis., as a bookkeeper and remained with this concern in various capacities until December 1886. In conjunction with his friend, Mr. George A. Whiting, of Menasha, Wis., and with local capitalists at Grand Rapids, Wis., the Centralia Pulp and Paper Company was formed and he became the manager of the company. He remained here until June, 1890, when he was called back to Appleton by the Van Hortwick interests to accept the position of general manager of their business. He remained here until December 1891, when he accepted an offer from Mr. Fred W. Taylor, general manager of the Manufacturing Investment Company with Mitscherlich sulphite mills at Appleton, Wis., and Madison, Maine, to become associated with him in the management of that business. Mr. Steele considers Mr. Taylor one of the most remarkable men this generation has produced and acknowledges his indebtedness to Mr. Taylor for inspiration in many directions.

In 1893 Mr. Steele accepted an offer made him by Mr. William Deering, head of the Deering Harvester Co., and entered the employ of this company, becoming a working partner in the concern shortly after going with them. He was connected with the company, in various capacities, until it was bought by the International Harvester Company in 1902. Mr. Steele had much to do with the formation of this company and had charge of the Deering assets. Mr. Steele entered the employ of the International Harvester Company on its formation and soon became General Manager of Manufacturing of that institution.

Owing to close attention to business his health became impaired and in April, 1906, he resigned his position with the Harvester Company and became Vice-President of the Port Edwards Fibre Co., at Port Edwards, Wis. On July 1st, 1908, the interests were purchased by the Nekoosa-Edwards Paper Co. and Mr. Steele became General Manager of the latter company which position he held until July, 1912, when he assumed the active management of the Brunet Falls Company at Cornell, Wisconsin. A year later, Mr. Steele gave up the active management of this company, intending to form a company to make kraft paper in the Southern States and devoted some time to investigate this proposition. Before he had completed these investigations the War came on and the plan was given up. On April 1st, 1915, Mr. Steele took the management of the Newsprint Manufacturers' Association, New York, and retained this position until September 1st, 1917, when he became General Manager of the Canadian Export Paper Company, Limited, of Montreal, a position which he still holds. (But resigned in January 1922.).

SIR WILLIAM PRICE.

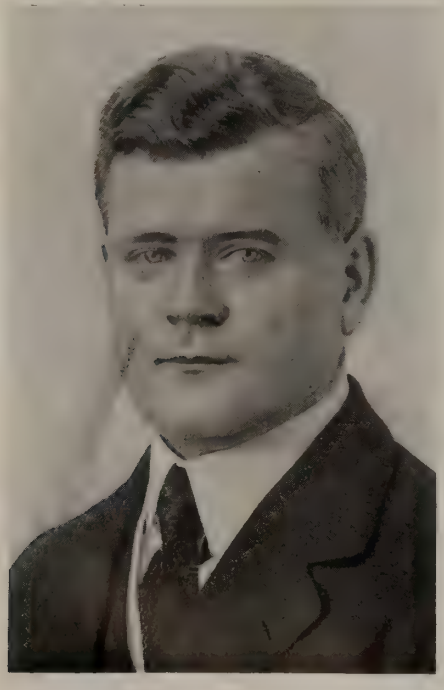
Sir William Price is President of Price Bros. and Company, Quebec. Sir William Price was born in Palea, Chile. He was sent for his education to England, where he attended St. Mark's School at Windsor. When his parents returned to Canada, he came home, and completed his training at Bishop's College School at Lennoxville. Meantime his three uncles had built up an immense lumber trade on the Saguenay and Lower St. Lawrence. At nineteen, William entered the office of his uncle, John Price, then left sole partner of the business. Thirteen years later, in 1899, his uncle died, leaving his nephew to care for the immense property. Since that time much has been done by Sir William Price to enlarge the scope of the business, especially in the way of branching out into the pulp and paper industry. With Mr. Porritt, he started the Price-Porritt Pulp Co. at Rimouski. Later he acquired the Jonquiere Pulp Co., near Chicoutimi. These were run independently until 1910 when, on a reorganization of the Price Bros. Company, they were absorbed in the larger corporation. The erection of the Kenogami Mills on the Au Sable River greatly enlarged by the Jonquiere Pulp Co.

Sir William Price has been prominent in public affairs. He has been chairman of the Quebec Harbor Commission, President of the Board of Trade, Governor of the Jeffrey Hale Hospital. He has been, in succession, director, vice-president, and honorary president of the Union Bank. His services during the late war earned him the rank of Colonel. Politically, he has been a strong conservative leader in Quebec.

The Interlake Tissue Mills Co. Limited.

By A. R. R. JONES.

The Interlake Tissue Mills Co., Ltd., with head offices on University Avenue, Toronto, and with mills which are admittedly entitled to high rank as regards excellence of construction and equipment, at Merritton, Ont., was organized in 1911. Construction of the Merritton mills was started in the following year, and manufacturing operations commenced in 1913. The original mill was a two-machine mill, with one machine installed. There have since been added to it a new finishing and specialty depart-



MR. GEORGE CARRUTHERS

ment; a new beater and stock room; a new boiler plant; and a new Harper-Fourdinier machine with its incidental equipment.

The equipment of the plant at the present time includes two 800 lb. beaters; one 1500 lb. double roll Marks beater; five 1500 lb. Noble and Wood beaters; four Jordans; one 116 inch Yankee tissue machine, with a widest trim of 108 inches; and one 148 inch Harper-Fourdrinier, with a widest trim of 140 inches.

The plant has several special features about it. In the first place, it is a gravity plant. That is to say it is so arranged that everything needed comes from a higher level in the course of the various processes of manufacture. Thus, pulp is delivered to the third floor of the mill, which means that the railroads bring it to a high level. Again, the coal comes in in cars right over the bunkers into which it is dumped directly, and from them it is run through chutes to the mechanical stokers.. In every department the same principle is employed, and the economy of labor, and therefore pecuniary expenditure, resultant therefrom is eminently satisfactory.

Then the plant has its own machine and plumbing shop which enables repairs to equipment to be executed on the premises. It prints its own labels. It has its own very complete wood shop. And it has gravity carriers to the shipping room. Speaking generally, the mill is of steel, glass and concrete throughout. The equipment leaves nothing to be desired in the way of efficiency, and the various manufacturing units are arranged with admirable convenience. No expense has been spared in perfecting the system of fire protection, heating lighting and ventilation. The conditions under which the employees work are beyond criticism in respect of sanitation, etc.

Growth Due To Quality Of Goods.

The rapid growth of the Company's operations is convincing and gratifying proof of the quality of the goods turned out by the Merritton mills. The products manufactured at these mills consist of a full line of white and coloured M. G. tissues, brown and coloured light weight M. G. wrappings, white and coloured drag wrap, all grades of fruit wraps. French folios, dry proof paper, a full line of toilet paper, paper towels, paper napkins, decorative crepe rolls, lunch and outing sets and other paper specialities.

Some Leading Toilet Brands

Amongst the brands of toilet paper manufactured, some of the leading lines are as follows: "White Cross," which is made from bleached white genuine crepe stock, put up in 8 oz. rolls and packages; "Interlake," a plain roll of special paper 8 ounces; "Household," a genuine manilla crepe roll 8 ounces; "old Dutch," a plain manilla tissue, velvet finish, roll weighing 11 ounces; "Blue Bird," genuine manilla crepe 6 oz. roll.

It should be mentioned that the word "Genuine" wherever used, is used in contra-distinction to "Machine Crepe" which is very different from the two-process or "Genuine Crepe" paper. The genuine crepe toilet papers turned out by Interlake Tissue Mills Co. Limited are hygienic, strong, absorbent, soft and cloth-like.

The foregoing and all other toilet lines manufactured by this Company are put up under labels, which are carefully designed with a view to attractive appearance.

Renowned For Many Other Specialties.

The Company is renowned for its outing sets. Each of these consists of two heavy genuine crepe paper table covers, 72 inches long by 54 inches wide, and 25 crepe paper napkins, and is enclosed in a transparent parchment (glassine) envelope, which keeps the contents free from dust and dirt until required for use. Equally favorably known is the Interlake lunch set, which contains one heavy genuine crepe paper table cover, 52 inches long by 42 inches wide, and 12 crepe paper napkins, put up in a transparent parchment (glassine) envelope. Prominent lines in napkins produced by the Company are the following Interlake napkins, of genuine bleached white crepe paper, 14 inches long by the same size wide; Canada napkins, of genuine bleached white crepe paper, 14 inches long by 14 inches wide.

The numerous lines of towels produced by the Company include the famous Interfolded towel put up in packages of 150 towels each, twenty-five of such packages, or 3,750 towels in all, making a case. Each towel is embossed with the name "Interlake," and being very absorbent, one towel will dry the hands and one the face. In this connection mention should be made of the Interlake towel cabinet which delivers one towel at a time. It holds one package of 150 towels. The cabinet is of metal, finished in dull, olive green, which harmonizes well with any woodwork or wall finish. This cabinet, while not absolutely necessary, is highly desirable for use with Interlake towels, inasmuch as it keeps the towels clean and reduces waste.

Of special interest to mothers of families are the children's hyginenic bibs, which are made up in packages, each package containing 25 pure white genuine crepe bibs, 16 inches long by 10½ inches wide, ready for use, and obviating the necessity of much washing or ironing.

Line Of Decorative Crepe Rolls.

The Company produces an especially high grade line of decorative crepe paper rolls. This is made in thirty-six beautiful shades, from which the most artistic combinations can be effected, while its uniformity of creping facilitates the production of the most pleasing effects. It is put up in rolls, each roll being guaranteed 10 feet long by 20 inches wide. The following are the colors in which the Company makes this high grade line of decorative crepe papers: Royal purple, purple blue, violet, helitrope, blue, medium pink, shell rose, cerise, jaque rose, ruby, carmine, geranium, terracotta, brown, mandarin, old gold, golden red, canary, yellow green, apple green, nile green, solar green, emerald green, victoria green, moss green, leaf green, forest green, black and white.

Another of the lines manufactured at Merritton that should certainly be noticed is that of carbon copy sheets. This line of second sheets is made in eight different shade—white, French grey, Manilla, green, blue, canary, pink and cherry. In size sheets are 8½ inches by 11 inches. They are of exceptionally light weight, and thus are of real service in economizing filing space. At the same time, they are remarkably strong and durable, and will stand rough handling. The rough surface on one side prevents the carbon from slipping and readily takes clear impressions, with no blur or smudge, while the smooth surface on the other side facilitates handling in files.

The Officers Of The Company.

Mr. George Carruthers is president and general manager of the Company, Mr. S. F. Duncan, secretary and Mr. I. H. Weldon, treasurer. Messrs. Weldon and Duncan, by the way, constitute the executive of the Provincial Paper Mills. Ltd., whose head offices are in the same building as those of the Interlake Tissue Mills Company, Ltd., Mr. Weldon being president and Mr. Duncan secretary-treasurer and general manager of Provincial. Mr. Carruthers is one of the best known men in the industry, and it is pretty safe to say that wherever he is known he is highly esteemed by reason alike of his business and his social qualities. For he is the sort of man to whom one instinctively feels drawn. He was born at Avening, Ont., and received his education at the Avening public schools and at the Buffalo Central Collegiate. From 1887 until 1890 he served as a machinist apprentice with the E. and B. Holmes Machinery Company, of Buffalo, subsequently becoming general foreman until 1893. He was machinist with the Snow Steam Pump Works, of Buffalo, during the years 1897 and 1898, and cashier of the Buffalo International Correspondence School until 1899, when he returned to Canada as organizer of agencies, later becoming Superintendent of Agencies for Canada until 1911. Then he organized the Interlake Tissue Mills Company, Ltd., becoming president and general manager of the concern, which offices he has since held. It will thus be seen that he has had a variegated business experience, one that, alike from the technical and from the administrative end, has embraced a wide field. Nor can there be



Bird's-eye View of The Interlake Tissue Mills.

CORRECTION.

The Sherbrooke Machinery Co., Ltd., write us as follows:

"We manufacture Grinders, but we have not manufactured them for a sufficient length of time so that it can honestly be said that "a fair percentage of it (ground wood) was manufactured" by our grinders, as the article on page 154 reads."

endeavor with which he has been associated. For he is a man whose interest does not run merely in one narrow groove. He believes in "broadening out." For example, he is president of the Ontario Pulp and Paper Makers' Safety Association and chairman of the International Textbook Committee for the Pulp and Paper Industry of Canada and the United States. He takes a keen interest in educational matters, and, as a member of the Advisory Board of the Canadian National Institute for the Blind, he has taken a prominent part in advancing the cause of education among the blind.

Excellent Shipping Facilities.

The Company's shipping facilities are excellent, both on the Grand Trunk Railway and on the Niagara, St. Catherine's and Toronto Railway, and it has its own electric switch. The employees of the plant at Merritton number between 100 and 150. The capacity of the plant is for 50,000 lbs. in the twenty-four hours, though more than that is possible in some lines of paper.

From its inception, the Company did a certain amount of export business, and, when the war broke out, this was, naturally, considerably increased, particularly within the British Empire, including Australia, New Zealand and South Africa. This export trade has, recently, been seriously interfered with, by reason of the curtailment of credits, but it is encouraging to learn that it is now looking up again. As regards the present business done generally by the Company, this is satisfactory, particularly in toilets. It may be added that the plant's capacity has been tripled since it was originally constructed. Mention has been made of the capital construction and equipment of the mill. And the operating personnel is being got into absolutely first-rate shape and is ready to cope with business, of any dimensions, that may come along. The Company's connections, both at home and abroad, are large and valuable, and there is no question but that a concern, so ably administered and setting before itself so high a standard of quality in its products is destined, by making many other similar connections, largely to expand a business which has already attained such eminently gratifying proportions.



The Japanese love nature. Why not? She even dries paper for them, as shown in this picture.

The President of the Association.

Percy Bateman Wilson.

Mr. Wilson was born in London, England on the 20th of December 1866. His training has been that of an accountant, which career he began by entering the office of James Lakeman, C. A., London. Mr. Lakeman was interested in a company at Kimberley, South Africa and on this account, for two and a half years, from November 1891, Mr. Wilson served as financial manager of the St. Augustine Diamond mines. At that time he started operations on his own account and bought diamond claims in the Koffyfontein mines in what then was the Orange Free State. A most enjoyable evening is in store for anyone who can induce Mr. Wilson to relate some of the very interesting experiences which he had in this connection.

In 1893 Mr. Wilson was married to the daughter of Nathanial Davies of London and revisited England on a holiday in 1895 when, instead of returning to South Africa he went into partnership with his brother as Chartered Accountants in London and in 1901 joined Samuel Allsopp and Sons Ltd., at Burton on Trent as chief accountant. Mr. Wilson served this firm for twelve years, during which time he lived in the village of Repton in Derbyshire.

Mr. Wilson's connection with the forests of Canada and their products came about early in 1913 when he was appointed director and secretary of the Forest Mills of British Columbia, Revelstoke, B.C. The following year he joined the Spanish River Pulp and Paper Mills Ltd. and became Vice-President in 1915. He will probably prefer to forget the harrassing circumstances through which he passed during the time that the newsprint industry was the subject of interference and persecution during the investigations at Ottawa and Washington. Since joining the Spanish River Pulp and Paper Mills, Mr. Wilson has lived in Sault Ste. Marie, where the head office of the company and one of the largest newsprint mills in Canada is located. In 1918 he was chairman of the Victory Loan Committee. This campaign was so successful that they gained the honor of naming one of the new Canadian Government vessels, and the ship was christened the War Algoma, after the district in which Sault Ste. Marie is located. Mr. Wilson's war record is far more extensive and honorable than even the notable services thus rendered would indicate for as soon as war was declared he joined the 51st Regiment Soo Rifles as Lieutenant and when the Colonel of this regiment went overseas, was appointed the O.C. of the Regiment with the rank of Major.

Major Wilson has a family consisting of two sons and two daughters. The former are studying at McGill University, one studying as an accountant and the other as an architect who has just recently a coveted prize for the design of a battlefield memorial.

In 1921 Mr. Wilson was elected president of the Canadian Pulp and Paper Association, which office he has filled with credit and ability.

Do noble things, not dream them all day long; and so make life, death, and that vast forever, one grand sweet song.—*Kingsley.*

Canadian Paper Box Manufacturers Association.

By S. J. FRAME, Secretary-Treasurer.

The formation of an Association of Canadian paper box manufacturers was first considered at a meeting held in Toronto on September 10th, 1914, at which eight paper box makers were represented. At this meeting a discussion took place respecting cost systems and the paper box business generally. A committee was appointed to formulate plans for the formation of the Association.

Later, owing to the uncertain business conditions arising from the war, it was decided to take no further action in the matter until such time as conditions became more settled.

Further meetings were held at Toronto on March 3rd and 21st and October 12th, 1916. As a result of this last mentioned meeting, steps were taken towards holding a Convention in the early part of the following year.

The First Annual Convention was held at Toronto on January 30th, 1917, and was an unqualified success, there being twenty-eight paper box makers represented from all parts of Canada, including representatives from St. John, Winnipeg and intervening points.

The Association is now very firmly established. Its membership, takes in a very considerable proportion of the paper box manufactures in Canada. In the operation of their factories, the members of the Association consume a large proportion of the tonnage of board turned out by the Canadian board mills. The Association has also a number of associate members. The feeling which exists among the members is of the most friendly character and the officers and members all give their best efforts to contribute to the Association's success.

Another factor contributing to the success of the Association is the Toronto Carton Club which is com,-posed of the Toronto members. This Club holds well attended luncheons twice each month in Toronto at which outside members are welcome, and which they do very frequently attend. The Toronto Carton Club also holds out-of-town luncheons four times each year which are attended by the Toronto members and by the other Ontario members.

The progress made by the Association and its present aims are indicated in the following circular issued by the Secretary under the date March 26th, 1920—

"Whereas the objects of the Association as set forth in the By-Laws are "to create better feeling and acquaintanceship among the members of the trade by social intercourse, also to deal with matters of mutual interest relating to the trade."

And, Whereas the Association having accomplished the said objects, towards maintaining the progress which has been accomplished in the past and towards making further progress, the objects of the Association, as set forth in the By-Laws are hereby changed to read as follows:—

By mutual co-operation among the members, —

To uphold the standing of the paper box business, by educating the general public to a realization of the usefulness and increasing necessity of the paper box, and the extent and size of the paper box industry.

To raise the general standard of efficiency of those in the business, whereby the capital involved shall have a proper return therein, the management shall be adequately rewarded, the wages paid and factory conditions shall be such as to attract a good class of labor, and to improve the quality of the product turned out.

To exchange information as to costs and other matters of general interest relating to the paper box business.

To maintain and continue by social intercourse, the good feeling at present existing among the trade, and those supplying it."

THE DEAN OF CANADIAN PAPER MAKERS.
Mr. J. R. Booth

John R. Booth, President of J. R. Booth, Ottawa, famous as Canada's lumber king and multi-millionaire pulp and paper manufacturer, was born in Waterloo, Quebec, April 5, 1827. When twenty-three years of age, he went to Sherbrooke and near-by districts, and finally to Ottawa, where he helped in the construction



MR. JOHN R. BOOTH.

of Lemay's sawmill, and soon after went into business for himself.

Since that time Mr. Booth has built up a large plant and is at the head of interests of world-wide fame. His activities have included the lumber trade, the manufacture of newsprint and paper, the construction of railways, and other varied interests of a capitalist.

His career as a railway builder began in 1881, when, with Mr. W. G. Perley of Ottawa and Governor Smith of Vermont, he constructed the Canada Atlantic railway, thus securing an outlet by rail to the New England market.

Later, Mr. Booth obtained a charter to bridge the St. Lawrence at Couteau, and personally financed the enterprise at a cost of $154,000. He was afterward identified with the construction of the Ottawa Arnprior and Parry Sound railways.

He has been closely associated with public affairs. In 1897 he was connected with the movement to have a non sectarian hospital built at Ottawa. The result was the erection of St. Luke's Hospital, of which Mr. Booth has always been president of the board of directors.

His family now consists of one daughter, Mrs. A. W. Fleck and two sons, Messrs. Jackson and Fred Booth.

T. McAvity & Sons, Ltd.

A high grade alloy of copper and tin and a very small percentage of phosphorus is generally recognized as the most serviceable combination to go into the manufacture of digester valves and fittings; the various components to be carefully handled in combining and the most advanced foundry practice carried out in order to achieve an ultimate product that will successfully resist the corrosive effects of bi-sulphite cooking liquor. Practically all the sulphite mills in Canada use bronze in their bottom digester fittings, blow-valves, strainers and acid lines.

In St. John, N.B., T. McAvity & Sons Ltd., have been in the brass and iron foundry business for eighty-seven years and their present day plant includes one of the most up-to-date brass foundries in Canada and a pattern equipment that they claim cannot be equalled in the Dominion in range and detail. They have been serving the pulp mills of Canada in their wants for acid bronze castings for some twenty-five years or practically ever since the need has existed for this class of material. Their product, which is manufactured and sold under the trade name of "World" bronze is well and favorably known in every sulphite mill.

Messrs. McAvity's plant includes their brass foundry which is equipped with latest devices for turning out their products; — oil burning metal melting furnaces having a capacity of ten to twelve tons per day, Tabor vibrating moulding machines, equipment for band-blast and acid-dip, and a large section of space devoted to heavy floor moulding, of which pulp mill castings are made up in big part. Their machines shops in Rothesay Avenue, St. John, are lately built and are said to be the largest and best of their kind in eastern Canada. At this plant also is the iron foundry and its machine shop and this foundry turns out much all iron special work for use in sulphate mills.

The pattern equipment which Messrs. McAvity have, includes patterns for all the latest digester fittings, such as bottom fittings, sleeves, thermometer pockets, "Y" blow-off valves, check valves, etc., and in quoting for their customers needs, the possession of this equipment places this firm in an enviable position.

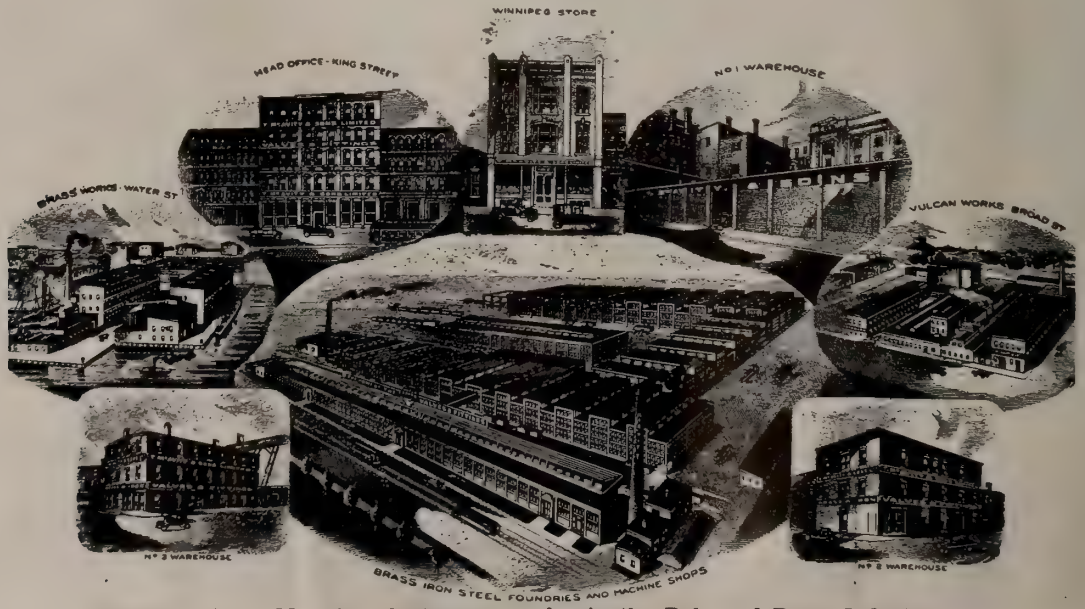
Canadian Vegetable Parchment Co.

The Canadian Vegetable Parchment Company, Ltd., at its mill at Merritton, Ont., manufactures genuine vegetable parchment. This is advertised under the trade name of "Purity Parchment"—and the name is a good deal more apt than are the trade names one sometimes sees given to other articles of commerce, inasmuch as it is a just description of the quality of the product which the company turns out.

The plant at Merritton is exceptionally well planned and constructed, the arrangement of the various manufacturing units being notably well devised, while the machinery is all of the most modern and efficient kind. The buildings are of brick, stone and concrete construction. The shipping facilities are all that could be desired, sidings of the Grand Trunk, Canadian Pacific, Canadian National, and Niagara, St. Catharine and Toronto railways running right by the plant. Further, the mill has the advantage of an unexcelled water system from wells of water of a most suitable quality for the purpose required.

The company has under construction a second parchment machine, and this, when installed, will double up the present producing capacity of the plant which is 2,000 tons per year of genuine vegetable parchment. It is gratifying to learn, as the writer did in conservation, this week, with Mr. C. V. Syrett, the company's president, that the plant at Merritton is running night and day, with orders seven or eight weeks ahead. The parchment paper it produces is already favorably known in Australia and New Zealand as well as in this country in which rather more than fifty per cent of its output is used.

The parchment paper produced is used for the purpose of wrapping meat, poultry, butter, oleomargarine, lard, cheese, ice cream bricks, biscuits and so forth. In this connection, it may be noted, as a satisfactory evidence of the manner in which the Canadian trade is backing up their Canadian enterprise, that the imports of parchment paper are sensibly diminishing each month. At one time nearly all the parchment paper used in Canada was imported from overseas, but, during the war, this trade became diverted from Europe and passed under the control of concerns in the United States.



Products of the McAvity plants are popular in the Pulp and Paper Industry.

They Build Machines to Make Paper And Ships to Carry It.

With the possible exception of the steel industry the pulp and paper trade is the greatest of all manufacturing enterprizes; Canada will be the greatest producer of pulp and paper of all the nations in the world and Port Arthur is the natural spearhead of this great shaft of industry in the Dominion. In or near Port Arthur should be located a reliable source of supply of the tools of the paper trade.

Outside of the mere facts which naturally govern the decision arrived at by a manufacturing concern considering the marketing of a new line of machines there is also something fine, something fascinating, something almost romantic in serving the paper trade.



Mr. JAMES WHALEN, President.

The plant of the Port Arthur Shipbuilding Company is situated on a tract of 110 acres of ground inside the breakwater at Port Arthur, it has a water frontage of 3,030 feet with 1,250 feet of docks. The whole area is served throughout by traveling cranes and standard gauge railways.

The great erecting shed is a frame steel trussed building 403 feet x 150 feet, with ample capacity to accommodate two wide, high speed "News" machines for erecting purposes.

The foundry is built of solid brick, steel trussed and has a floor 90 feet x 160 feet. This building, like all the others, is built on the solid rock and in it is blasted out a pit of ample width and depth to permit the casting of a large "Yankee" dryer 14 feet in diameter and 150 inches in face, or in it can be cast two dryer cylinders simultaneously, 60 inches diameter by 250 inches face.

The joiner shop, in which has been built all the woodwork for many a fine yacht and freighter, lends itself to the erection and building of flow boxes, cylinder vats, wet machines, etc. This joiner shop is built of solid brick, is two stories high and has a total floor area of over 10,000 square feet.

In considering the advisability of building pulp and paper machinery, the Port Arthur Shipbuilding Company developed the fact that paper machine building is not as high a grade of the art of machine building as machine tool work, or reciprocating engine work, but really grades somewhere between these types and the rougher classes typified by agricultural machinery. The Port Arthur Shipbuilding Company concluded that there is no reason why any well appointed machine shop provided with the proper plans and specifications should not build as successful a paper machine as the oldest and best of those firms who have been engaged in paper machine building for generations. This conclusion has been confirmed by the success achieved by the Dominion Engineering Works in building the great news machines for the Laurentide Company. These machines are not only the first that the Dominion Engineering Works built, but in their manufacture they had the assistance of only one man familiar with the art of paper machine building. In this particular case old established precedents and methods of paper machine building were departed from and the result is that this machine probably represents the most advanced type of paper machine ever built being capable of a paper speed of at least 1,000 feet per minute and lending itself in its basic design to easy operation and facile change of clothing.



Mr. JOHN W. BRASSINGTON,
Chief Engineer, Pulp and Paper Machinery Mfg. Dept.

The President of the Port Arthur Shipbuilding Company is Mr. James Whalen. There are few men who can boast the wide acquaintanceship that Mr. Whalen has in Canada and the United States.

The Port Arthur Shipbuilding Company in its manufacture of pulp and paper machinery has acquired the services, as Chief Engineer, of Mr. John W. Brassington, whose long service in charge of design with the Pusey & Jones Company and whose practical experience as Chief Engineer and Manager of Manufacturing for the American Writing Paper Company of Holyoke, Massachusetts, qualify him to assist ably in the development of their pulp and paper machinery building department. Mr. Brassington is an Engineer, trained in England and has the advantage of many years active engineering practice in the United States.

Wood Preparing Plant of T.S. Woollings & Co.

That section of Northern Ontario traversed by the T. & N. O. Railway, long recognized as one of the most fertile sources of pulpwood in the Dominion, is fast proving that such is the case. Some of the largest pulp and paper mills in the country draw their full supply from this territory and a very large proportion of the wood finds its way across the border to the United States. Probably one of the largest users of pulpwood from this section of the Province is the Armstrong-Forest Company of Johnsonburg, Pa., as almost a complete train load every day is shipped from the T. & N. O. district across the line to them.

The largest shipper of pulpwood from Northern Ontario to-day is the Thos. S. Woollings Company of Englehart who employ in geting out the pulpwood all told nearly two thousand men, and in order to increase production at the minimum cost this Company have recently built and equipped a complete new modern cutting-up and barking plant at Connaught Station, Ont.,

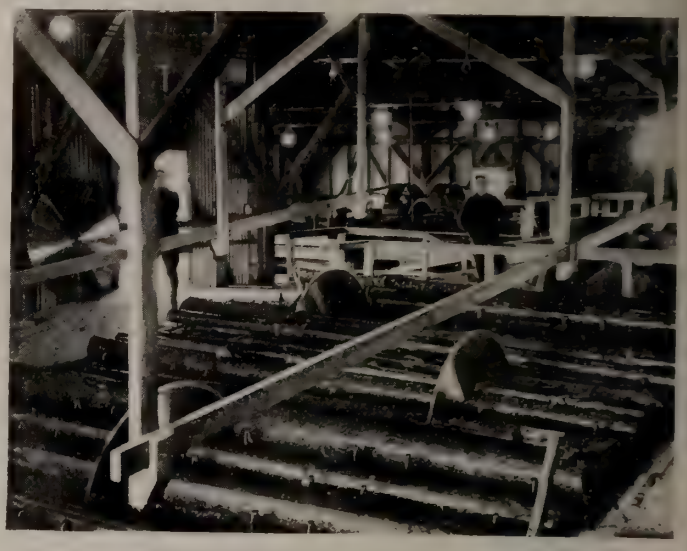


General View of the Rossing Plant.

on the line in from Porquis Jc. to Timmins. The site selected covers about one hundred and sixty acres about a mile west of Connaught Station on a branch of the Frederickhouse River, and is an ideal location for such a plant. The whole area is very level allowing of easy access for piling and for sidings into the yards, and the river takes a very convenient bend at this point making an ideal booming ground for the logs.

The haul-up, which is of three strands is almost two hundred feet long, and the logs, nearly all sixteen feet long, are brought up and discharged onto the slash table direct. Three sixty inch saws cut up the logs here into four foot lengths which are then conveyed to two ten foot diameter barking drums, each thirty feet long. From the drums the barked wood is conveyed to the piling grounds by cable conveyors and the main conveyor when completed will be some eighteen hundred feet long. The haul-up and slasher are driven independently by motors as is each conveyor and each drum, making the whole plant a very flexible one indeed. Electric power is generated by two slow speed generator sets installed in the engine house and these in turn are driven from a batttery of four seventy-two inch boilers sixteen feet long, arranged with dutch oven settings.

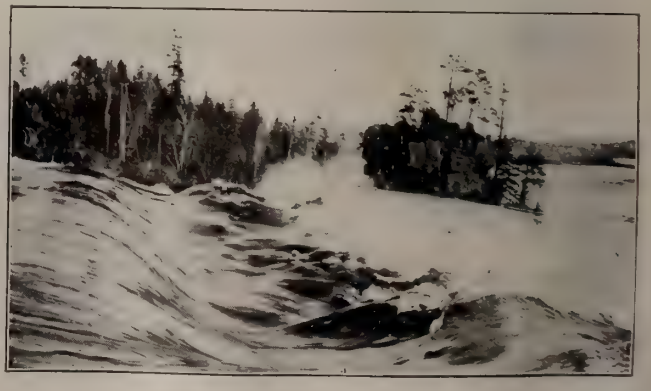
The whole plant has been built on solid concrete foundations and the boiler house is of steel construction throughout, reducing the possibility of fire here to a minimum. Ample provision has also been made against fires by the installation of a large Goldie & McCullough fire pump. Provision has been made in the boiler house for the installation on a fifth boiler to drive the small sawmill which the Woollings Company intend moving



The Slasher at T. S. Woollings & Co.

from its present site near the station, down alongside the barking plant, this season. When this plant is running to capacity some thirty to forty cords of barked pulpwood should be turned out every hour. Provision has also been made in the system of conveyors to allow for the installation of more drums which will make this plant one of the most up-to-date as well as one of the most efficient barking or rossing plants in the country. Some sixty men are at present employed by the Woollings Company around this plant. The barked wood will all be shipped to the Armstrong-Forest Company at Johnsonburg, Pa.

The engineers on construction were Messrs. Sutcliffe & Neelands, New Liskeard, Ont., and the equipment including power plant, outside of the motors, and generator sets, was supplied by the William Hamilton Company of Peterborough, Ont. The electrical end of it consists principally of Canadian General Electric Company equipment. The drums were supplied by the Canadian Barking Drum Company.



Before the Falls at Grand'Mère Were Harnessed. The St. Maurice Bears the Wood and Turns the Wheels for Making 990 Tons of Paper and 1,560 Tons of Pulp in Five Mills Every Day.

The Canadian Paper Trade Association

By the General Secretary.

On March 4, 1918, a small but very enthusiastic body of western paper merchants met in Winnipeg and discussed the matter of forming an association of paper dealers throughout Canada. As a result of this meeting a convention of those interested was called in Toronto on the 3rd and 4th of the April following. This meeting was attended by the representatives of some thirty firms, and resulted in the formation of The Canadian Paper Trade Association. The organization has since been completed and now comprises the majority of the recognized jobbers of paper throughout the Dominion—from Coast to Coast. The Association is composed of five branches, namely — Maritime, Quebec, Ontario, Prairie Provinces and British Columbia.

At the first meeting of the Association it was decided that this organization was not to have as its object the enhancing of prices, nor was it in any sense to be one to control or fix the price at which any member was to sell his wares. This is a matter which each individual must work out for himself. There are, however, a number of problems of mutual interest which the members have found it of the greatest advantage to handle through the medium of an association. For instance, the Association has worked with the Canadian Pulp & Paper Association of the Mill Men in the standardization of weights, sizes and colors. The members have fixed among themselves standards of terminology, such as the definition of what constitutes a bond paper. A register of trade names in use throughout Canada has prevented duplication and confusion; local credit bureaus are in operation, and various trade customs have been settled in such a manner as to improve trade conditions for the manufacturer, the merchant, the printer and the consumer.



Mr. C. J. KAY,
President Canadian Paper Trade Assn.

Periodical meetings of the various branches of the Association are held, and an annual meeting of the whole Association takes place in September.

Practically every wholesale fine paper house in Canada is a member of the Association. If these conferences meant nothing else besides giving the paper men the opportunity of becoming better acquainted with one another, of obtaining a bigger and broader grasp of the paper industry and of the varied problems with which they have to deal day by day, they would be well worth while. The whole spirit of the Association, and of the co-operation and mutual help thereby made possible,



Mr. N. L. MARTIN,
Secretary Canadian Paper Trade Assn.

has demonstrated to the members of the Association that by all working together they can the better find and follow the way along which lie better business, better methods and better conditions for all.

PULP AND PAPER PERSONALITIES.

George H. Chahoon, Jr.

George H. Chahoon, Jr., is President and General Manager of the Laurentide Paper Company, and President of the Canadian Pulp and Paper Association, 1920.

He was born in Ausable Forks, New York, the son of a former New York senator, who was connected with one of the first sulphite mills in America. From his birthplace he went to Glens Falls one of the locations of the International Paper Company. He worked up through the mills, becoming, when he was about twenty-five years old, superintendent of the Northern New York mills. This position he held for about three years, until, in 1903, he was chosen by the president of the Laurentide Paper Company as general manager. His wonderful organizing and executive ability are shown in Laurentide's remarkable growth and in the co-operation and efficiency which have marked the company's progress. Credit is also due to him for the fact that Grand'Mere is now a model town, for which he has recently secured a charter and a civic manager. During the war Mr. Chahoon was business manager of the department for manufacturing gas shells and poison gases at the Edgewood Arsenal in Baltimore. For these services the title of "Colonel" was bestowed upon him.

Messrs. L. B Holliday & Co. Limited

It will be of interest to our readers to learn of the progress made by this firm in the manufacture of Aniline Dye and Coal Tar products.

Founded in 1915 the progress of L. B. Holliday & Co. Ltd. has been remarkable, particularly so when it is realized that the first sod was not cut until September of 1915, but moreover in contrast with other firms who have succeeded in some measure in meeting the dye shortage, Messrs. L. B. Holliday & Company started from absolute zero in having no plant, no staff, no process in work and no business connections established.

It is quite true that the fresh start carried with it some advantages also. There was no temptation, for example, to be satisfied with tinkering with old and in-



MAJOR L. B. HOLLIDAY.

adequate staff, or plant, or buildings or site; but all these could be chosen with care and planned on a scale commensurate with the new needs; so that to take one point only, the new Works at Deighton is admirably situated with regard to canal frontage and railway facilities.

Huddersfield has loug been noted for its cloth mills, its engineering shops and its chemical work, and has always borne a very honorable name as a pioneer and for long the most successful producer of synthetic dyes in England. After the discovery of the first color derived from coaltar Huddersfield immediately became important as the chief centre of tar distilling in the country and colors were actually manufactured and new patents taken out in the early sixties.

Now while much of the town's dye-making activity is turned into large and state-aided channels, the original spirit of individual enterprise and the name of Holliday with which it was always associated, are perpetuated in the firm of L. B. Holliday & Co. Limited.

The production of dyestuffs and drugs had not commenced at the end of 1917, as the works had up to then produced only Picric Acid for war purposes, yet the output had reached, within six months, the subtantial amount of fifty tons per month, comprising more than twenty separate products. Today the plant is capable of turning out 150 to 200 tons per week. That this creditable result is due in the first place to the individual enterprise and energy of Major Holliday lends a good deal of point to the reflection that L. B. Holliday & Company, Limited.

Particular attention has been paid to the needs of the paper trade, and great care has been exercised in producing and recommending colors for this highly important business. The latest addition to their range is NEWS BLUE which is now being manufactured in sufficient quantities to enable the marketing of a product which possesses no superior, either in quality or price.The development of the Basic Colors and the Direct Colors have been particularly rapid and successful.

The establishing of a Canadian Branch marked another step forward in the progress of the firm and it was realized that good stocks would have to be carried to cater for the Canadian requirements. The development of the Canadian Branch has resulted in further expansion larger premises have had to be taken and increases of staff have been made to cope with the work. The Technical Department of the Montreal Branch is well organized, and matching work is speedily undertaken and good results recorded.

Furthermore, Messrs. L. B. Holliday and Company are only too anxious to have an opportunity to demonstrate personally their products, and the staff are always at the disposal of the color users. Finally, the Research Department of the work in Huddersfield is always prepared at any time to undertake extensive work on behalf of any Canadian House, and enquiries in this line would be welcomed.



Mr. HAROLD BROOK,
in charge of the Canadian Branch.

ELECTRICAL PAPER MACHINE DRIVES IN CANADIAN MILLS.

BY THE EDITOR.

The application of electricity to the drying of paper making machines is one of the most important developments that the industry has experienced since the invention of the Fourdrinier machine. It ranks with the application of steam to the drying of the paper in place of the wood or charcoal fires which at one time served to furnish the heat necessary for the evaporation of water from the sheet. The use of electricity as a driving force is generally made use of in two distinct ways; either a big motor of the variable speed type, or of constant speed with a speed changer, is used to drive the ordinary type of line shafting for the variable speed end of the machine, or a series of motors each driving an individual part are so connected by a control mechanism that all run in harmony. The first method permits variation in the speed of the whole machine within the range of the main motor, but variations of speed for individual sections because of localized conditions are still dependent upon the belt drives from cone pulleys.



Mr. F. G. WARBURTON,
Designer of the Harland Drive.

The second method makes possible not only a uniform immediate, and simultaneous change of speed throughout the entire machine but makes possible a very nicely graduated speed change on any section where conditions may be even momentarily altered and this is instantaneously and automatically accomplished without the use of belts required to transmit any material amount of power.

The disadvantages attendant upon belt transmission and long lines of shafting with spur gears, clutches, belts, bearings, etc., which result in loss of power and lack of accurate control or delicate adjustment, have been the main factors in bringing about the development of the sectionalized electric drive which greatly conserves and reduces the power requirements and permits of instantaneous and automatic adjustment for the slightest changes in the speed of any section of the machine. In fact, the changes of speed which will cause the corresponding adjustment of the motor speed for any section of the machine with electric drive equipment, have been found to be often but a fraction of the variation of speed frequently occurring just from the slippage of belts on the ordinary types of mechnical drives.

There is no question that Canada holds the record for the progress made in the adoption of the sectionalized paper machine drive. There are two important reasons for this. In the first place, Canada is pre-eminently the land of electricity; no country in the world has greater advantages with regard to easily available sources of adequate hydro-electric power within short transmission distance of the great centres of population and industry. In the second place, the pulp and paper industry in Canada is developing with exceptional rapidity and the installation of a number of new machines was a strong inducement to apply the latest features in their equipment. It may be remarked however, that the electric drive is not necessarily a feature of a new machine because a Canadian mill has equipped an old machine with an electric drive with the greatest success.

There are three types of electric paper machine drives installed in Canadian mills, which, given in the order of their installation, are the Harland Patent Interlock, The General Electric and the Westinghouse, provided respectively by the Harland Engineering Co., the Canadian General Electric Company and the Westinghouse Electric and Manufacturing Co. Taken in this order, a brief review will be given of the principal features of the drive and the type of machines equipped with each. No attempt of a technical discussion will be made as such descriptions have already been published in the trade journals. The sectionalized paper machine drive has been in operation for a number of years in a British mill. The experience derived from this installation led to considerable improvements so that a nearly perfect equipment was available for the Canadian mills that decided upon this feature for their new machines.

The Harland Drive.

The first mill in Canada to be equipped with a sectionalized paper machine drive, was at the Laurentide Co., where the Harland equipment was decided upon. It is of special interest to note that the machines equipped with this drive were the first paper machines built in Canada and the first newsprint machines in the world to reach and continue to operate at a speed of 1000 feet per minute on newsprint paper. They were built by the Dominion Engineering Works. The machine room in which they are placed is without question the finest paper machine room on the continent and with the record breaking equipment is a feature of the mill which makes every employee proud of his connection with it.

There is no doubt that the successful running at such speed with such satisfaction, is largely due to the installation of the Harland Engineering Company's equipment, has to do with another record but in another direction. The Interlake Tissue Mills at Merritton, Ont., put in a 148'' Harper machine which is an exceptionally wide machine of this type. This also was built by the Dominion Engineering Works and is the first machine of its kind to have been equipped with an electric drive. Many new problems were encountered and successfully overcome and the machine operated satisfactorily at high speed but the company has since decided to convert the wet end into a straight Fourdrinier type equipped with the Edwords attachment for tissue machines. The experience of the Harland concern in the solution of unusual problems made in connection with this machine, is however, of the greatest importance in the development of the electric drive. The fourth installation of the Harland drive is in connection with a partially re-built machine at the Crabtree Mills plant of the Howard Smith Paper Mills. This machine is making sulphite bonds and high grade lithograph papers.

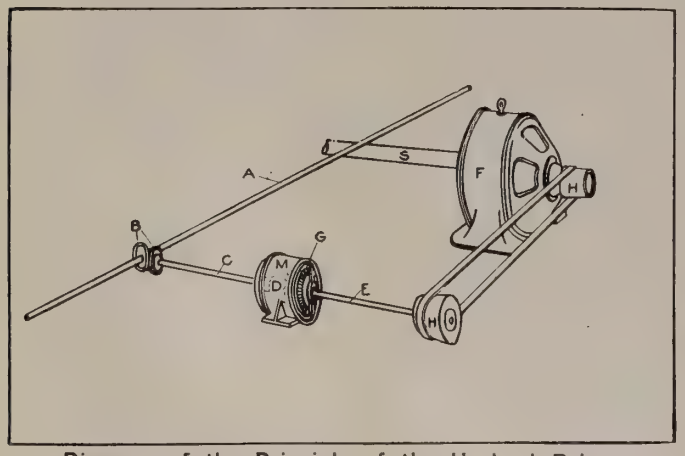


Diagram of the Principle of the Harland Drive.

The Harland Patent Interlock drive for paper machines consists briefly of one motor each for the couch pressfirst, second, etc., wet presses, calenders, and reel, and one or more motors for the dryer part according as to whether this is operated as a unit or in sections. The motors can be selected to be of very nearly just the capacity required to operate the part to which they are attached but in order to take care of extra starting load, are usually made slightly larger than actually required. One of the driving motors or a small separate motor, if such is desired, is selected as a master motor whose speed represents the normal operating speed for the machine, although the speed can of course, be changed at will as operating conditions require. The master motor drives a master shaft which runs in ball bearings and extends the length of the machine. From the master shaft A (see sketch), there is driven, by a bevel gear B, a spur shaft C, for each sectional motor at the same speed as the master shaft. At the free end of the spur shaft is a differential gear D which connects the spur shafts C and E. The speed of the motor F, relative to the speed of shaft E is controlled by the position of the belt connecting cone pulleys H. The spur C carries one part of the differential gear while spur E terminates in the other part so that when there is no difference in the speed of spurs C differential gear. If however, there is a difference and E, there is no movement in the third member of the in speed this is reflected in a greater or less turning of the third member of the differential gear depending upon the difference in speed. This third member carries a rheostat contact arm G which passes over a ring of contacts and any shifting of the contact arm causes a variation in the strength of the field of the motor F and accelerates or retards it as may be necessary so as to bring it back at once to its proper speed relative to that of the master shaft. This motor is connected to the part which it drives through the intake shaft S. The regulating effect takes place either way so that the speed is either brought up to, or down to, that which is required.

If it is required tat the speed of the motor for a certain section be increased, the change is accomplised by shifting the belt on the cone pulleys H so that the position of the contact arm is moved to a contact point that produces a variation in the motor field sufficient to bring about the desired change in speed. If the motor speed is to be decreased, the belt mentioned is shifted in the other direction. It is to be noted that this belt has but a negligible amount of power to transmit since it has only to turn the shaft F in its ball bearings.

It will be seen that a change in the speed of the master shaft will automatically and immediately cause a corresponding change in the speed of every motor connected with it, while an independent adjustment of the speed of each sectional motor can be made as the machine tender finds necessary to accommodate changes in draw between sections.

THE GENERAL ELECTRIC DRIVE.

The sectional paper machine drive developed by the engineers of the General Electric Co., is based on an entirely different principle from the one just described. In this case the connection between the various units is entirely electrical, although a similar distribution of motors is made in either type of drive. The General Electric drive has two motors at each section, a main driving motor and a small synchronous motor. The two are connected by means of a pair of cone pulleys and a belt the adjustment of which provides for the small variations in speed which are always required on a paper machine to take care of unavoidable changes in draw occasioned by variations in the character of the stock and the quality of the paper. Changes in speed however, due to such causes as changing the weights on a press or a faulty lubrication or a number of other things, must be compensated automatically by a successful electric drive. This is accomplished by the General Electric equipment as follows. So long as every section is turning in unison there is no current from one synchronous motor to another along the bus bars connecting them. If however, a change in speed tends to take place, say on the second press, due to a change in the weights, this press will tend to turn more slowly but the synchronous motor must make its normal number of revolutions per minute. It is forced to do this because it cannot get out of step with the other synchronous motors without drawing current from them and any current drawn from the other synchronous motors, which would have to run faster than the one at the second press, at once makes them generators, the second press motor acting as a motor delivers the power thus produced to the

main second press motor and maintains its speed at that required by the speed control for the entire machine. There will thus be no change in the draw between the first and second press or the second press and the drivers. In the case of the General Electric drive, as with the one first described, each unit is independent as far as stopping, starting or inching is concerned and the speed of each section can be adjusted within quite wide limits relative to the speed of the rest of the machine.

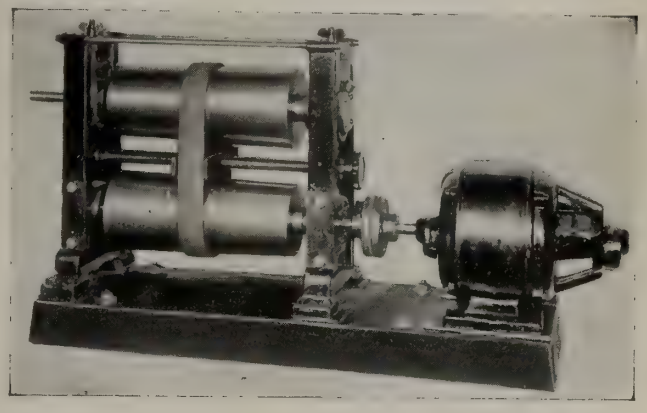
The General Electric Company has two machines in operation which are equipped with this drive, namely, the new Bagley and Sewall machine 164 inches wide for the Ontario Paper Company. The drive is designed to drive the machine at 500 to 1000 feet per minute. The Spanish River Pulp & Paper Co. also has a new 164'' Pusey and Jones machine designed to run at 800 ft per minute equipped with this type of drive. The four machines built by Bagley and Sewall for the International Paper Co's mill at Three Rivers, will also be equipped with the General Electric drive and these will soon be in operation, making a total of 11 installations.

THE WESTINGHOUSE DRIVE

The Abitibi Power and Paper Co., at Iroquois Falls, Ont., was the first Canadian Company to install the sectionalized paper machine drive developed by the Westinghouse Electric and Manufacturing Co. This drive is attached to the new 158'' Pusey and Jones machine. There are the following section motors, one couch press, 3 wet press, 2 independent dryer sections not geared together, one calender stack and one reel. The winders are driven independently from the main part of the paper machine. The drive is designed to operate the machine at speeds from 400 to 800 ft per minute and can be adjusted for still higher speeds if necessary. As in the other cases mentioned, it is possible also to run the whole machine or any other section at very low speeds for such purposes as washing up, putting on felts, etc.

The automatic control system consists of a small master frequency generator, driven by a small direct current motor operating in parallel with the section driving motors and separately excited; a small frequency generator driven from each of the section driving motors through a small speed changer consisting of two cone pulleys, to one of which the frequency generator is coupled; a powerful synchronous type of rotary relay for each driving motor, which serves to make an electrical contact in one direction or the other on the slightest unbalance of frequencies; and a motor-operated field rheostat, under control of the relay, in the shunt field circuit of each driving motor. The master frequency generator is common to all sections of the paper machine, whereas each section has its own section frequency generator, relay, and motor-operated field rheostat.

The small frequency generators are all excited by alternating current, but since the master and section frequency generators are excited from the same source, any variations in frequency or voltage in this general circuit have no effect upon the regulation, as they affect all these generators alike and do not disturb the balance of frequencies at the rotary relay. Since no appreciable amount of power is required to operate the rotary relay, these frequency generators are small in size. The speed changers referred to are of small size, as they do not have to transmit power, but simply overcome bearing friction of the small frequency generators and the friction of their own ball bearings, which is practically negligible. By shifting the small belt of these speed changers, the relative speeds of the sections, or the draw of the paper, as it is called, is accurately and positively determined by the operator, and is thereafter maintained automaticallly at the correct value. Any unbalancing of the two frequencies at the rotary retlay, caused by change in speed of any driving motor, immediately causes adjustment of the field strength of the motor, and returning the speed to the required value.



The Westinghouse Speed Changers and Section Frequency Generator.

The control board, consists of a master control panel for the paper machine as a whole, controlling the main generator and master frequency generator, and a unit section control panel for each of the section driving motors. The push button stations,mounted on the paper machine frame, provide convenient means for starting, stopping and obtaining any desired speed of the paper machine. The principle of this system of electric drive is exceedingly simple and no extended period of adjustment of the electrical equipment is necessary.

It is worthy of note in this particular, that two days after the Abitibi paper machine was started, it was placed on regular continuous commercial production, to the complete satisfaction of the mill operators and management.

A SPANISH DITTY.

Bubbles.

"We're forever makin' paper,
Makin' paper roll by roll;
Pile it up high, up to the sky,
The more we make, the more they'll buy.
In Soo and Espanola,
Sturgeon Falls as well,
We're forever makin' paper,
Makin' paper rolls to sell."

"We're all agreed,
This is some feed,
It's what we need,
It is indeed;
Let's smoke a weed,
From care we're freed,
For what a friend we have
In George H. Mead."

Spanish River News.

Harrisons & Crosfield Limited.

"Mobilitate viget, viresque acquirit eundo."

The House of Harrisons & Crosfield dates from 1844 Crosfield formed a partnership in the Tea business in Liverpool, Eng., Daniel Harrison having previously been when Daniel Harrison, Smith Harrison and Joseph in partnership with Octavius Waterhouse until 1842.

Without attaching undue importance to the date of a joint venture which had probably come about through personal relations uninfluenced by external events, it is worth while remarking on the legislative and economic landmarks of the early forties if only to emphasize the great changes in the conduct of trade which were then taking place. The foundation of the house thus coincided with a period of wide legislative reforms, among the chief of which were the liberation of trade from tariffs and hopping restrictions; an era highly favorable to commercial enterprise and in particular to the development of business with the Far East.

After 1900, however, Tea ceased to be the firm's sole interest. The days of plantation rubber had come and Harrisons & Crosfield were foremost in its development. They had established a branch in Colombo in 1895 under the name of Crosfield, Lampard & Co., of which Mr. George Croll, until recently chairman of the company, was the first Manager. The development of the business overseas, together with the growth of the Rubber Industry and the responsibilities which it entailed, had made it essential to ensure greater continuity than a partnership could afford, and accordingly in May, 1908, the business was registered as a Limited Company with a capital of £307,500.

The progress made by the Company since its foundation in 1908 cannot be described in detail. As in the case of most growing concerns it has taken the form of a constant enlargement of the sphere of operations, with the devolution here and there of specialized branches of the business which can best be carried on by separate companies.



HARRISONS & CROSFIELD, LTD.
Head Office, London, Eng.

The interhouse trading by which each concern is in the position of being able to supply direct had led to an expanding business, especially in the Far East and Australasia, in Paper, Machinery, Hardware, Chemicals, Woodenware, Soft Goods, Groceries, quite apart from the raw materials which each centre requires. This policy of interchange of products of the various countries in which Harrisons & Crosfield Ltd. are represented, places their customers throughout the world in a position to secure their requirements of raw materials or manufactured goods in the best market.

The Export Department of the Montreal Branch has been active in fostering trade in Canadian manufactured articles with Australia, New Zealand and Far Eastern Countries. Special attention has been paid to those articles which Canada is economically suited to export, the intention being to develop only permanent foreign business. Considerable quantities of high grade bonds, ledgers, writing papers, also newsprint, wrappings and bags, etc., have been marketted in overseas countries and there is every reason to expect a steady trade will be kept up.

An important feature of the Company's activities in recent years has been the development of Estate work and general trading in the Dutch East Indies, Japan, Borneo, and elsewhere.

The issued share capital of the Company has been increased several times since 1908, and now amounts to £1,844,986.

MACKINNON STEEL CO., LIMITED

The plant of the MacKinnon Steel Co., Limited is located at Sherbrooke, Quebec, on the main lines of the Canadian Pacific, Grand Trunk, Quebec Central, and Boston & Maine.

This company was established in 1909 to handle the fabrication and erection of structural steel and steel plate work of all kinds. The original plant has been greatly extended and now covers a space of 125 x 340 ft. comprising main structural steel and plate shop, machine shop, templet and pattern shop and general office. The storage yard has a capacity of approximately five thousand tons of shapes and plates and the company carries a heavy stock of beams, channels, universal mill plates, sheared plates, etc.

They have an engineering department fully organized for the designing and detailing of all steel structures and have in their employ experienced structural steel workers and boiler makers, a large number of whom have been in the employ of the Company since its formation.

The MacKinnon Steel Co. Limited has handled large contracts for practically all of the large pulp and paper erected not only steel structures for buildings, storage, black liquor, dissolving, causticizing, filter, bisulphite, wash, lime mixing, and wet machine tanks; diffusers; hoppers; bins; lime kilns; bridges; penstocks; smokestacks; etc.etc.

Mr. J. W. Boman, of Boston, Mass., is President of the Company, Mr. George D. MacKinnon, Vice-President and Managing Director, Mr. H. W. Welsh, Manager, Mr. F. C. Johnston, Secretary-Treasurer and Mr. E. Holgate, Chief Engineer.

The Company is represented in Halifax, N. S. by R. R. Power, Metropole Building; Moncton, N. B. by

Moncton Supply Co.; Montreal, Que. by W. J. Lochhead, 404 New Birks Building; Toronto, Ont. by A. R. Wooldridge 220 King Street W. Victoria, B. C. by T. B. Ross & Co. Ltd., Central Building.

The Laurentide Company Ltd.

There are two factors of primary importance in the success of the Laurentide Company, its location and its organization.

Wood and Power are the great necessities of the pulp and paper manufacturer, and the strategic situation of Grand'Mere in regard to both could hardly be improved upon. The St. Maurice river watershed, about 16,000 square miles in area, practically uninhabited, and still largely covered with the original spruce forest, lies above Grand'Mere, and from almost any part of this great basin, logs may be driven, entirely by water, to the mill. The South Shore of the St. Lawrence, always one of the largest sources of pulpwood supply is 300 miles nearer to the Laurentide Company since the Quebec Bridge was built; and the large and unexploited area tapped by the National Transcontinental Railway lies still nearer to the north. In addition to these natural supplies of wood the Laurentide Company is planting considerable areas of waste land in the immediate vicinity of the mill. When the timber on these lands matures the yield per acre should be at least ten times that of the natural forest and logging expenses proportionately cheaper.

Without a constant supply of cheap power no groundwood pulp mill can be economically operated. It will never be necessary for the Laurentide mill to shut down for lack of power, or to accumulate the large and expeusive piles of stored pulp necessary at mills whose water supply is less ample and uniform neither the quantity nor the quality of the Laurentide product ever suffers from the deterioration inevitable in stored and rehandled pulp. The power now generated at Grand'Mere is about six times larger than the requirements of the mills (the balance is sold to a neighboring power company).

In building the Laurentide organization the first consideration has always been, of course, the efficient and progressive operation of the mills. The comparatively low costs of the Company's products, the adoption and development of magazine grinders, high speed news machines, and other features, are witnesses to the effectiveness of this side of the management's policy. But the management has, also, done its best to promote advantageous community conditions. It has invested a very considerable sum of money in comfortable homes for its employees, and in a really good golf course, club houses, tennis courts, and so forth. The town last year obtained from the legislature a new charter, and has entrusted the executive functions of its government to a manager, who is the most experienced and highly trained engineer that the company could find for the position. It has also, been agreed that a certain fixed sum should be expended yearly by the company upon permanent improvements for the town. Another very important feature of the Laurentide organization is the fact that the management has always been resident in the town, and in close touch with the life of the place. As a result of all these things the community has a solidarity of interest and a singleness of purpose which cannot but react happily upon the fortunes of both em-



The silent guardian of Grand'Mere.

ployers and employees and hence upon the success of the Laurentide Company as a whole.

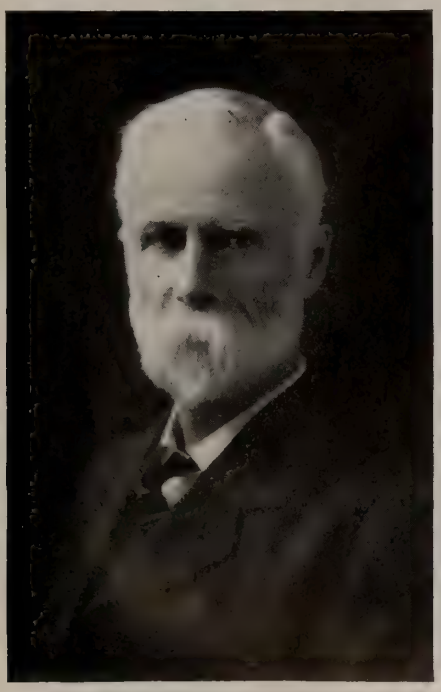
There is not another community on the Continent where improved natural advantages and happy industrial conditions made resident more attractive or employment more agreeable. Happiness contentment and goodwill literally pervade the atmosphere of Grand'-Mere.



Structural & Steel Plate Plant of McKinnon Steel Co. Ltd.,

A Long Established Business

The phenomenal expansion of the pulp and paper industry has called into being many new concerns, not only for the manufacture of pulp and paper, but for supplying the hundred and one commodities essential to the industry and also for placing the finished product on the market. While acknowledging the enterprise of such firms, the part played by some of the old-established companies in building up the industry must not be overlooked. Through good and bad periods such firms have succeeded in establishing reputations of which they are justly proud. The industry now covers a very wide scope, but at the periods at which some of the firms were founded it was comparatively limited in the products manufactured, and in the processes employed.



Mr. J. R. WALKER

The firm of J. R. Walker Company, dealers in wrapping and roofing papers and in waste materials, 35 Common Street, Montreal, is an example of one of the long established firms to which we refer. It was founded in 1878 by Mr. J. R. Walker. Born at Sillery Cove, Quebec, in 1850, Mr. Walker obtained his earlier business training in Quebec in the office of his father who was connected with the wholesale timber trade. But Mr. Walker had more ambitious objects in view, so he left Quebec to become, in 1873, junior partner in the firm of J. and W. Reid, Montreal, dealers in waste material and wrapping and roofing papers and owners of the Lorette Paper Mills. The death of Mr. Reid resulted in Mr. Walker taking over the business in 1878 under the name of J. R. Walker. Several years later, after the death of the last senior partner in the firm of J. &. W. Reid, the Quebec branch was incorporated with the business of J. R. Walker & Company.

The activities of the firm have expanded to a very large extent, the governing policy being to make such business connections as afforded an outlet for the commodities handled by the firm. Thus an interest was acquired in the Dominion Leather Board Company and the Macniven & Cole Paper Mills, Sault-au-Recollet, both these concerns being amalgamated, and carried on under the name of J. R. Walker & Company. The mills were burned in 1915 and rebuilt on a larger scale. The manufacture of building and roofing papers and fibre board is carried on in these mills.

Many years ago, Mr. Walker become associated with Miller Bros. & Co. with box board mills at Glen Miller, on the Trent River, Ont. In 1914 the firm acquired an interest in the Canada Box Board Company, Seigneur Street, Montreal, and in 1885 removed to 35 Common amalgamated with the box board mills at Frankford and at Campbellford, on the River Trent, Ontario. The combined concerns are now known as the Canadian Paperboard Company, of which Mr. Walker is Vice-President.

J. R. Walker were originally located at Foundling Street, Montreal and in 1885 removed to 35 Common Street, where the offices are situated, the upper floors being devoted to the sorting and packing and storage of waste materials.

The waste paper department of the business has in recent years largely increased, and in order to provide accommodation and better railway facilities the property at 267 Wellington Street, with railway siding, was purchased and that department of the business is now carried on there.

Mr. Walker's two sons are associated with him; Mr. William E. Walker has charge of the business connected with the paper trade, and Mr. Frank E. Walker looks after that section relating to the woollen manufacturing industries.

The chief interest of Mr. J. R. Walker outside business is in municipal questions. He has some very definite ideas on local self government—and knows whereof he speaks. For 14 years he was a member of the Westmount Council and also served as Mayor of that model municipality.

GUY TOMBS, J.P., CHEVALIER ORDER OF LEOPOLD 11.

Mr. Guy Tombs who is the contributor of the article on pages 77-91, was formerly the Canadian Northern representative in Montreal and has thirty years' experience in transportation work. For the past two and a half years Mr. Tombs has been General Traffic Manager of the Canadian Export Paper Co. Ltd., and, in addition, has supervised or directed the traffic of the Belgian Industrial Company, Brompton Pulp and Paper Co., Canada Carbide Company, Canadian Electro Products Co., Canadian Paperboard Co., Donnacona Paper Company, Howard Smith Paper Mills, Laurentide Co., Maguire, Paterson & Palmer, Canadian Match Company, Limited, Pembroke Lumber Company, Price Bros. & Co., Provincial Paper Mills, Shawinigan Water & Power Company, Canada Paper Company, and St. Maurice Paper Company, and is also President of the Menjobagues Lumber Company and the St. Maurice Valley Pulpwood Company Ltd. Mr. Tombs is a member of La Chambre de Commerce, Canadian Pulp and Paper Association and the Canadian Manufacturers Association and Vice-Chairman of the Transportation Committee of the Montreal Board of Trade.

Since December 1st, Mr. Tombs has taken over the Traffic Department of the Canadian Export Paper Company under the name of GUY TOMBS, LIMITED. The new firm will continue to handle the traffic of the companies above mentioned and will also undertake freight brokerage and the solution of traffic problems generally, specializing in the handling of overseas business through Canadian ports.

The Electro-Chemical Plant of the Canadian Salt Company, Ltd.

The Canadian Salt Company, who, for more than thirty years have manufactured salt for domestic and commercial purposes, established a chemical plant in 1910 for the manufacture of caustic soda, bleaching powder and chlorine derivatives. Up to this time the Canadian trade was supplied with these products from the States and Europe but now, through the application of a modern, efficient electrolytic process, is able to get these products in the highest degree of purity, produced almost entirely from Canadian resources, labor and materials.

The process used involves the general principles of the various electrolytic chlorine plants and the differences between them are mostly details of construction and operation.

Saturated brine is pumped from the wells — which are from 1600-1800 feet deep—directly into tanks where it is chemically treated to eliminate the small amount of impurities always present. The purified brine is then fed directly into the electrolytic cells where the salt (sodium chloride) is decomposed by an electric current into its two elements, sodium and chlorine. The chlorine gas which is liberated at the surface of graphite anodes is led away through stoneware pipes to the bleach chambers or to other parts of the process where it is utilized. The sodium, liberated at the cathode, immediately reacts with the water present to form a dilute caustic solution. The latter escapes from the bottom of the cell and is conducted through pipes to a storage tank to await concentration. Hydrogen, formed during the latter reaction, is also piped to parts of the plant where it is utilized.

The process from this point consists of two steps. The evaporation of the caustic liquors is carried out in multiple effect vacuum pans and when it has reached a concentration of 50 per cent. it is led to large cast iron pots which are heated to such a degree as to drive off all the remaining water, leaving molten caustic. This is poured into steel drums, and, on cooling, solidifies, in which condition it is ready for the trade.

Bleaching Powder — Chloride of Lime.

For the manufacture of Bleaching Powder (Calcium Hypochlorite) the chlorine gas is conducted to large lead lined or concrete chambers upon the floor of which is spread hydrated lime. The gas is absorbed on coming into contact with the lime forming Bleaching Powder—the so-called Chloride of Lime of commerce. Part of the chlorine is now being used in the preparation of metallic and organic chlorides.

The motive power at the Sandwich, Ont., plant of the Canadian Salt Co. is supplied by two triple-expansion, vertical engines of 720 K.W. each, equal to about 1,000 horse power. There is also a 850 h.p. Bellis and Morcom, non-condensing compound engine and a 750 H.P. Corless engine for heavy duty. The three first mentioned are from the works of the Goldie, McCullough Co. of Galt. During the past five years the electricity used at Sandwich has been Hydro power which comes into the plant at 26,000 volts and after being stepped down in transformers is run through two 2,000 K. W. rotary convertors to produce the direct current required for the cells.

All commercial strengths of solid, lump and crushed Caustic Soda are made. The Bleaching Powder is the standard 35-37 per cent. variety, the bulk of which is consumed by the pulp and paper trade. Much, however, is also consumed by city water purification plants, metallurgical processes, textile mills, laundries and as a disinfectant.

It has always been the aim of the Canadian Salt Company to produce products of the purest quality and to co-operate with their customers in every way possible in order to make a bleach which will have all the qualities desired by consumers. In order to carry on this work a very complete and well organized laboratory is maintained and is placed at the disposal of the trade in order to work out special problems which may arise in connection with bleach, its application, or in connection with any of the other products manufactured by them.

The Canadian Salt Company was started in 1890 and expanded largely under the direction of the late Ernest G. Henderson. The present officers are Sir Thomas Tait of Montreal, Que., President, and George M. Duck of Windsor, General Manager. The Chemical Plant is under the direction of Alfred Moreton, Superintendent.

The best things are nearest; breath in your nostrils, light in your eyes, flowers at your feet, duties at your hand, the path of God just before you.

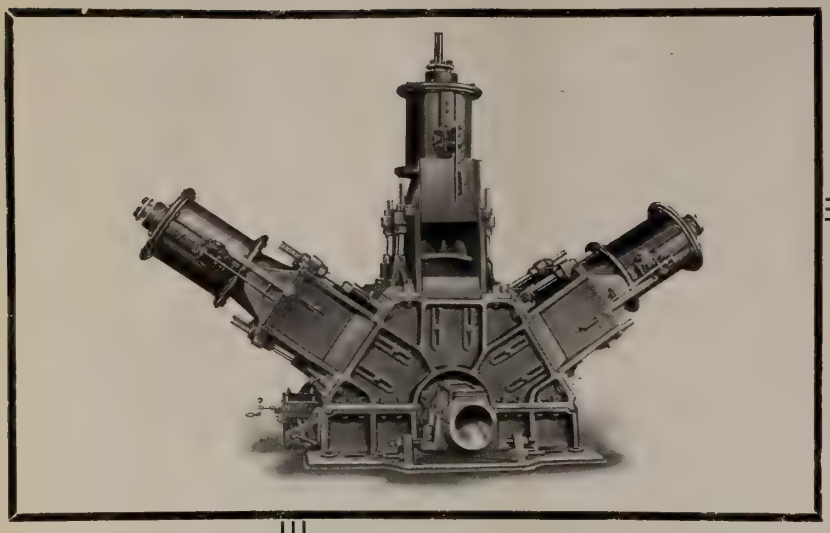
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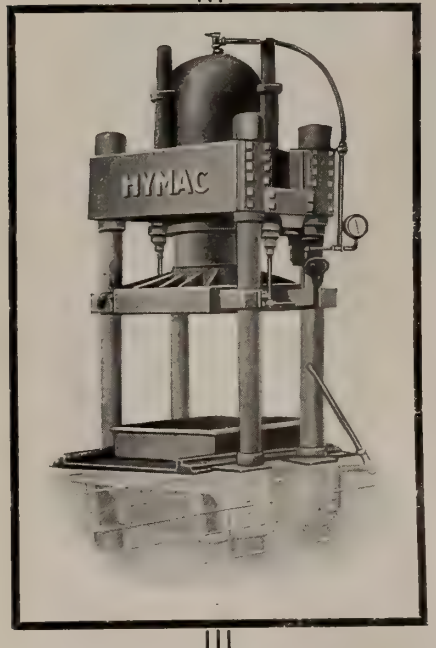
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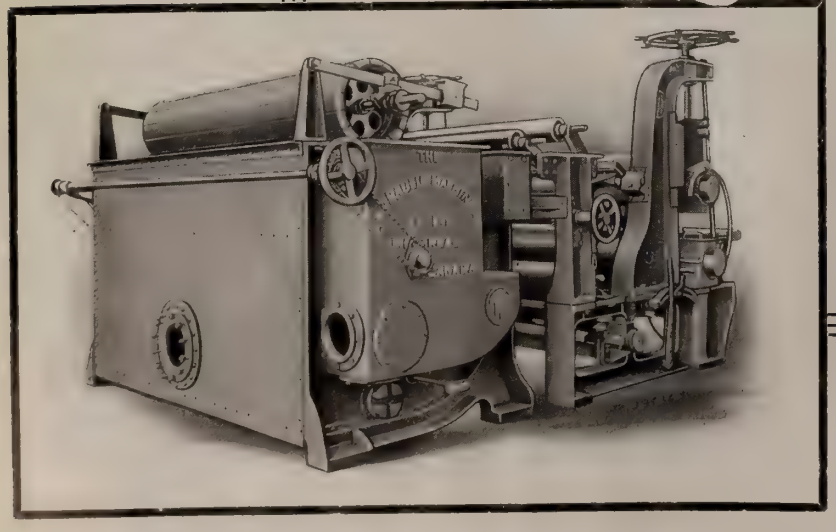
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THE HYMAC LINE



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Hydraulic Pulp Presses.
Hydraulic Pulp or Paper Baling Presses.
Hydraulic Pressure Pumps.
Hydraulic Accumulators.
"Hymac" Quick Opening Gate Valves.
Save-All "North Patent".
Water Filter "North Patent".
Acid-Resisting Bronze Valves and Digester Fittings.
Pulp Thickeners, Cylinder Moulds.
Pipe Line Water Filters.
Portable Hydraulic Forcing Presses.
Etc., Etc.



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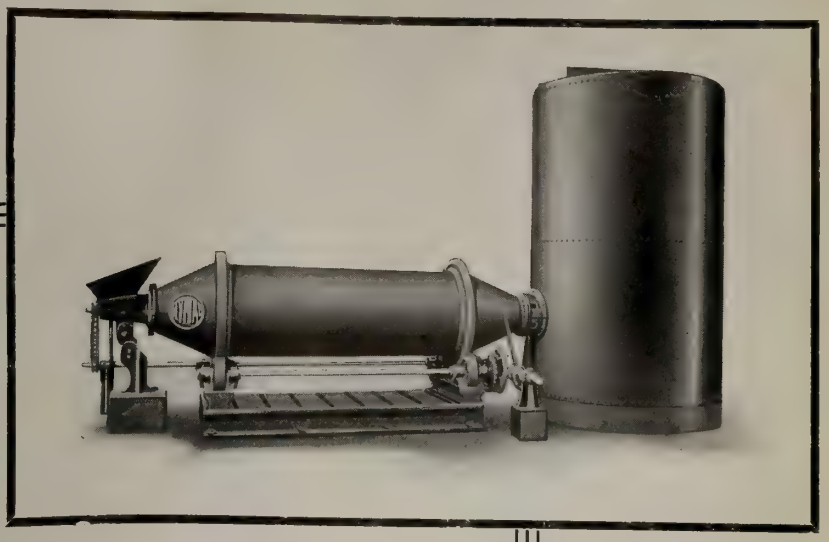
Hydraulic Machinery Co. Limited

MONTREAL **CANADA**

HYMAC

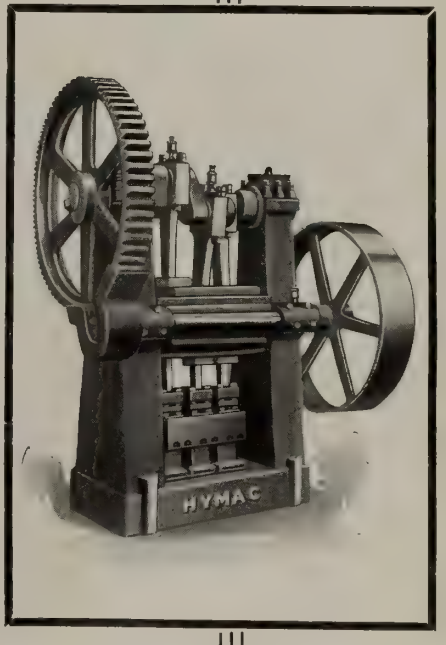
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THE HYMAC LINE



The "HYMAC" Line is Fully Illustrated in the Following Bulletins, They are Yours for the Asking;—

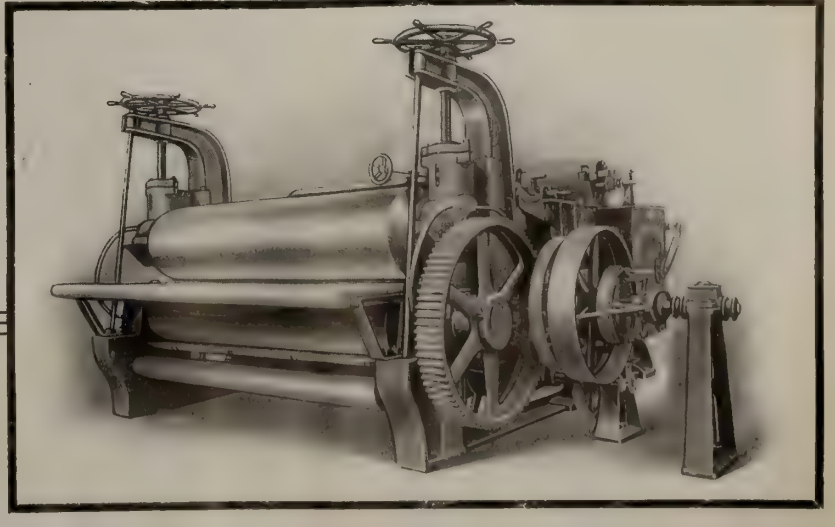
A—Hydraulic Pulp Presses.
B Hydraulic Pulp Baling Presses.
C—Hydraulic Pressure Pumps and Accumulators.
E, F and G—Acid-Resisting Bronze Valves and Digester Fittings.
O—Pulp Pressing Equipment Complete.
P—"Hymac" Quick-Opening Gate Valves.
Q—Rotary Sulphur Burning Equipments.
R—Repair Part List Covering Our Standard Pulp Mill Equipment.
S—Portable Hydraulic Forcing Presses (for the Repair Department).
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Sherbrooke Makes Much Machinery.

The position of Sherbrooke relative to transportation facilities, hydro electric power, competent and dependable labor, and relative nearness to important manufacturing centres, has made natural the development of foundries and machine shops in this community. Among the most extensive and well-known concerns of this nature is the Sherbrooke Machinery Co., Ltd. This company numbers in its list of products, many items of pulp and paper mill equipment.

It should be understood at the outset that the Sherbrooke Machinery Co., is closely affiliated with the Improved Paper Machinery Co., at Nashua, N.H. and the same products are manufactured in both plants.

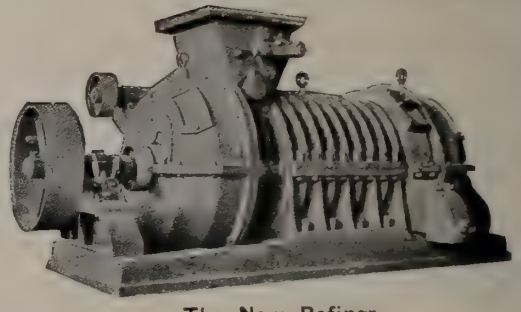
One of the fundamental machines in the Pulp and Paper Industry of Canada is the pulpwood grinder which produces mechanical or groundwood pulp. More than a million tons of this grade of pulp were produced last year in the Dominion. A fair percentage of it was manufactured on grinders supplied by the Sherbrooke Machinery Co., and recent improvements to the company's grinder ensure which increase its efficiency.

When pulp has been produced the next operation is to separate the fibres which are of the proper quality for paper making, from those which have not been sufficiently reduced, and for this purpose several types of screens are used. The screens, or strainers, as they are sometimes called, made by the Sherbrooke Machinery Co., are specially designed for different classes of service for which they are required and some will give finely screened stock which is all ready for paper making while others are designed to re-screen the tailings discharged from the fine screens and separate from them fibres which are temporarily carried off. This saves a great deal of waste where the tailings are not recovered and decreases the work on the refiners where the tailings are thus taken care of.

A new refiner has recently been developed which embodies a number of novel ideas. This machine is shown in the accompanying illustration. It consists of a horizontal cylindrical chamber in which revolve 4 heavy iron rollers. The stock is fed at one end and discharged at the other and its passage through the machine is made positive by vanes operating somewhat like a screw conveyor, the bundles of fibres and knots are crushed between the shell and the rollers which not only pound by their weight but also crush by reason of their being required to revolve through the action of a special gearing. The wearing parts are made easily replaceable and the machine is giving excellent service.

The screened stock is too thin for pumping directly to the paper machine storage or for bleaching in the case of sulphite stock. Pulp thickeners and washers are therefore included in the equipment manufacture by this company. In case the pulp has to be shipped it is made into laps and Sherbrooke wet machines made for this purpose are among the most efficient on the market.

In the paper mill besides the screens of various types according to requirements, special attention has been given to other accessories of the paper machine. Among these, the spiral wound couch roll has found a good reception by the trade and the Warren calender feed doctors have not only simplified the threading of paper



The New Refiner.

through the stack but have, at the same time, greatly reduced the danger attendant upon the handling of this part of the machine. It must be borne in mind that while many items of equipment can be standardized yet the selection of the proper machine and, where necessary, the alteration of it to meet certain conditions is essential to the successful operation of the machine in the mill. Special attention is given to this phase of mill equipment manufacture.

Among other pieces of apparatus made for the Pulp and Paper Industry, mention should be made of the knotters for removing uncooked chips and knots from chemical pulp; pneumatic savealls for eliminating waste of fibre in water from wet machines and paper machines and water filters for keeping clean the supply of the most important material used in the mill.

The company's officers are men who are well-known to the industry, they are engineers who have studied the needs of the Pulp and Paper Industry and realize the conditions that must be met in operation. Mr. Arthur J. Connor is president, Mr. Wilbur F. Raby, manager of manufacturing, Harold J. Reed, manager of sales, and Claude L. Spafford, resident engineer.



Plant of the Sherbrooke Machinery Co. Ltd., Sherbrooke, Que

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The William Hamilton Company Ltd.

Among Canadian Industrial Concerns, This Old-Established Company Manufacturing High-Grade Machinery of Various Kinds Takes a Place In the Very Front Rank.

By A. R. R. JONES

One of the best known of Canadian industrial concerns is the William Hamilton Company, Ltd., of Peterborough, Ont. Its extensive plant is one of the oldest manufacturing establishments in that enterprising city, having been in operation since the year 1856. It has grown from a small repair shop to one of the foremost manufactories in the Dominion and its products are in use all over the country.



Huge draft tubes for a water turbine.

Mr. William Hamilton, who laid the foundations of this big business, was born in Swinton, Berwickshire, Scotland, in 1823. At twenty-one years of age he came to Canada and worked at the machine business in Cobourg and Hamilton until 1848, when he went to the United States. He worked at his trade in various cities in that country, and, in 1850, started a foundry and machine shop at Shelbyville, Indiana. Six years later, he returned to Canada and settled in Peterborough, where, in conjunction with a Mr. James White, he bought a small plough-maker's shop. The business was continued, and developed into a general foundry, engine and mill machinery business. In a few years Mr. Hamilton took over Mr. White's interest in the business and carried it on as the William Hamilton Manufacturing Company, the products of which, more especially in the sawmill machinery business, soon became known all over Canada. Mr. Hamilton died in 1902.

The Plant and Its Units.

The plant covers an area of some ten or twelve acres. It is thoroughly up-to-date in every respect, and is most completely equipped with special machinery for handling its varied work. It is situated in convenient proximity to the centre of the city, and is fortunate in the possession of admirable shipping facilities.

The floor space of the various units is as follows: The foundry (gray iron and brass) which is equipped for handling all requisite sizes of castings, has a floor space of 15,000 square feet. The machine shop, which is filled with the most modern machinery, has a floor space of 25,000 square feet. The floor space of the plate shop is 7,500 square feet; that of the wood and pattern shop, 11,500 square feet; that of the storage buildings, 10,000 square feet; that of the pattern storage buildings, 20,000 square feet and that of the smithy, 1,500 square feet. The plant is of brick construction throughout.

Hydraulic Turbines Manufactured.

The company manufactures hydraulic turbine machinery, pulpmill machinery, sawmill machinery, structural steel and steel platework, rock crushers, and castings.

Among its products, hydraulic turbines form one of the most important lines. Among those turned out may be mentioned the Vertical Standard Turbines, which are splendidly built, of great strength and durability, and equipped with double steel bucket runners fitted on steel shafts. There are large top and bottom lignumvitae step bearings for carrying the revolving part of these turbines, including the weight of extra upright shafting and gearing. Another feature of them is the balanced swing-type gates, with separate, adjustable steel connections, and each gate removable independently. All bearings are of large dimensions and special material, and the couplings are bolted.

Mention should also be made of the Vertical Type Z Turbines—another special line in turbines. These are especially designed to develop the highest power, speed and efficiencies, for direct connection to generators and other high-speed machinery.



A busy spot in the Hamilton shop.

As showing the popularity of the turbines manufactured by the Company, it may be mentioned that it recently supplied five to the Montreal Cottons, Ltd., of Valleyfield, Que.; three to the Dominion Textiles, Magog, Que.; three to the Milltown plant of Canadian Cottons, Ltd.; and three to the Cornwall plant of the last-mentioned concern.

Pulp and Paper Machinery

Another prominent line in which the Company specializes is that of pulp and paper machinery. It supplied the new Riordon mill at Kipawa with a large part of its equipment. It has supplied Fraser, Ltd., of New Brunswick, with much machinery, including a sulphite cylinder machine weighing between 800,000 and 900,000 lbs., and including, also, pulp screens and pulp screening machinery and transmission machinery and conveyor. The Company also recently installed a pulpwood rossing plant for the Ontario Hydro-Electric Commission, and is now installing a pulpwood rossing plant for Woollings, Ltd., of Englehart, Ont.

The Jordan engines manufactured at the plant of the William Hamilton Company, Ltd., have this unique feature about their construction—that the base is cast integral with the shell, thus ensuring rigidity and also further ensuring that the shell is kept true, to ensure which point the shell is further ribbed. The head is finished, so that it does not require a gasket at this point, and all the bolts are arranged with a swivel joint, so that they can be swung back out of the way and not become lost. There are no screw caps at any place in this Jordan. The bearings throughout are bored to receive die cast babbit bushings—a very important point inasmuch as it ensures absolute alignment at all times. The machinery throughout is standard and all plants are kept to gauge. Large clearout openings at the small end of this Jordan are worthy of special attention. These are far larger than usual—a fact which facilitates quick cleaning in case of necessity. The plug is made so as to have a thrust of twelve inches, thus using up to the best possible extent the Jordan filling.

In addition to Jordan engines, the other equipment which the Company manufactures for pulp and paper mills includes log haulups; pulpwood slashers; pulpwood conveyors; barking drums; centrifugal pulp screens; pulp grinders; beating engines; slush storage tanks; chippers; chip crushers; chip screens, rotary and flat; digester fittings; push fans; agitator drives; refuse burners, and transmission machinery.



Who will hitch this power to a turbine?

The Company also manufactures Shartle Bros.' famous Stuff Pumps. These pumps possess several unique features which have caused them to be recognized as leaders. Starting at the base, the suction can be connected from any of the four sides, and this base is cored, so that the pump can be arranged to handle either one, two, or three kinds of stock, providing the pump is a triplex pump; in the case of a duplex pump it can handle two kinds of stock. The action of the valves is peculiar to this pump alone. In all other stuff pumps, the rise and fall of the ball is in a vertical position. In this pump, the ball rises and falls in practically a 45 degree angle, thus making it easier on the pump, as well as enabling it to handle much coarser material, and also making less wear on the balls and on the ball seats. The ball seats are held firmly in place by means of two vertical set screws which act on vertical retainers on the inside of the pump, the retainers, in turn, pressing against the seat. These retainers also act as false liners for the valve chamber, and together with the false liner inserted in the front of the valve chamber take up all the wear due to the ball action. All the stock passages in this pump are of greater area than usual and are free from sharp turns. The plunger is made from cast brass, and will stand repeated turnings. The cross head is provided with wide wearing surfaces and bearing surfaces and will stand years of wear. The bearings on the counter-shaft and on the crank-shaft are bored. Bronzed bearings are used in the crank shaft, and die cast babbitt bearings in the counter-shaft. The gear is split, facilitating easy removal. The counter-shaft can be placed on either side of the pump, which, in connection with the fact that the intake is taken from any of four sides, makes a very flexible arrangement for installing the pump. A very important feature of this pump, moreover, is that everything is easily reached—there is not a single nut or bolt at any part of the pump which is hard to get at.



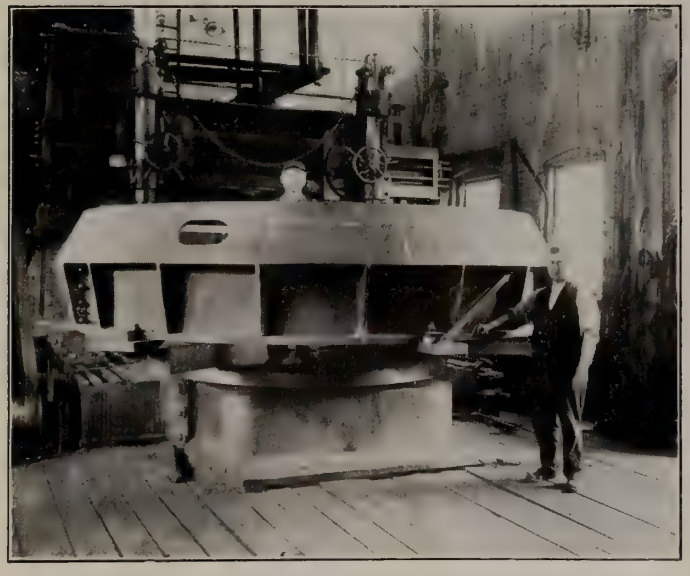
Massive molds in the Hamilton foundry.

High Grade Sawmill Machinery

The Company has long enjoyed an outstanding reputation for its output of high grade sawmill machin-

ery. It has been, in this connection, distinguished for its efforts to accelerate and improve the economical manufacture of good lumber and to keep abreast of the changes and improvements in the manufacture of the band mill. Its New Design Steam Tension Band Mill is notable for its rigid construction, compactness, simplicity of arrangement and up-to-date design. It has been installed in some of the largest sawmills in Canada, from coast to coast, and has met with a splendid reception from mill men. It is up-to-date in every detail, accessible in every part, with a wonderfully quick and sensitive straining device.

Among its lines in lath mill machinery mention should not be omitted of the Improved "Hamilton" Lath Bolter, which was especially designed to meet the demand for a strong machine of large capacity. The weight of this machine is 1,800 lbs. The Company's Improved "Hamilton" Lath Mill is the companion machine to its improved lath bolter, and it also is of great strength and durability, especially for turning out a large output of lath. It has an improved device for preventing the bolts from flying



An enormous casting for a water wheel.

back, thus eliminating any danger to the operator.

Among many firms whom the Company has supplied, in the line of sawmill machinery, with complete mills may be mentioned John B. Smith & Sons, Callander, Ont.; Fraser, Ltd., of Campbelltown, N. B., and William Sullivan, of Newcastle, N.B.

It may be added, in supplement to what has been said above as to the Company's eminence in the manufacture of hydraulic machinery that it has done considerable work for the Government in the way of supplying lock-gate mechanisms in connection with the Trent Canal. The Company also specializes in structural work and penstock work.

The present officers of the Company are as follows: Mr. Daniel Smith, of Kingston, Ont., president; Mr. P. P. Westbye, vice-president and general manager; and Mr. L. A. Potvin, secretary-treasurer. The foregoing, with the addition of Messrs. G. G. Gladman and Freeman Talcott, constitute the directorate. Mr. Daniel Smith is a retired manufacturer of wide business experience. Mr. P. P. Westbye is an engineer by profession. He has been with the company since 1911, and a number of patents belong to him. In 1914 he became consulting engineer to the Company and remained in that capacity with it until 1918,



A view of the machine shop.

when he assumed his present position. He is a member of the Engineering Institute of Canada; of the American Society of Mechanical Engineers; and of the Canadian Institute of Mining and Metallurgy. Mr. Potvin has been with the Company since 1900, and Mr. Gladman since 1908, when it was reorganized. Mr. Freeman Talcott is a prosperous farmer of Bloomfield, Picton County, Ont.

The employees, all men, number about 250. There is a fine mutual spirit of attachment between them and the Company. They have an Athletic Association of their own, which makes provision for baseball, hockey, bowling, and so forth. They play in the city's recreation parks, and the Company puts up trophies for inter-shop competition in sports.



Massive Pulp Drying Machine for a Canadian Mill.

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The Crane System For Paper Machine Dryers

By H. J. BARTLETT
of the Specialty Department, Crane Co., Chicago.

The principal objects to be attained in the efficient operation of any paper machine — bearing in mind that we are now speaking of the drying only — may be roughly classified as follows:

1. The rapid removal of air and water from the dryers.
2. Rapid circulation of steam through the machine.
3. Economical consumption of steam.
4. Graduation of temperatures throughout the machine.

The drying end of the paper machine consists of a large number of cast iron cylinders usually arranged in two tiers and gear driven from steam engines or large electric motors. Steam is supplied to these cylinders through hollow trunnions, and the condensation is removed by either syphons or dippers. The syphon is a small stationary pipe bent down close to the inner periphery of the dryer, with its upper end leading out through the hollow trunnion and thence connected to the return header. Its operation is dependent upon the maintenance of a difference in pressure between the dryer and the return header. The dipper is merely a scoop or series of scoops, fastened to the head of the dryer and revolving with it. At each revolution these scoops dip into the accumulated condensation and elevate it so that it flows by gravity to the return header.

In common with most devices that utilize steam as a heating medium, paper machines have been subjected to endless difficulties in regard to proper regulation of steam supply, effectual removal of condensation and air, and a multitude of kindred ills.

Drying the Paper.

The drying effect in the machine is produced by the transfer of heat through the shell of the cylindrical dryers from the steam within to the sheet in contact with the external surface. The rate of this transfer depends primarily on the thickness and composition of the film of water and oil adhering to the inner surface of the shell and the amount of air contained in the dryer. Water is a poor conductor of heat except when in rapid circulation. In a paper dryer it acts as an insulator to prevent the heat of the steam from reaching the paper, and also absorbs part of the available heat in the process of re-evaporating. Air likewise is a poor conductor of heat, and tends to prevent an even distribution of steam throughout the dryer.

The presence of water and air in the dryer then greatly lowers the capacity of that dryer for doing useful work. Were all the dryers on a machine to accumulate water and air and remain in that condition, the result would be a marked decrease in the quantity of paper produced. Usually, however, the dryers operate intermittently, that is, they alternately become partly filled with water and cool off, then suddenly discharge it and heat up. The result of this operation is even more harmful than that mentioned above, as the sheet will then become too dry and strained in one place and wet or bagged in another.

In addition, dryers partly filled with water have a tendency to "sweat," which causes spots to appear on the finished sheet. In plain words, it is impossible to produce a satisfactory sheet of paper efficiently unless all the dryers on the machine are kept continuously free of water and air.

The Crane System accomplishes this result by maintaining at all times a constant drop in pressure between the steam in the dryer and the steam in the return head-



A canadian mill equipped with the Crane System.

er of the machine. This applies to every dryer on the machine from the last one on the calender end to the first one on the wet end. The drop in pressure causes such a rapid circulation of steam through the dryer that the water of condensation is carried out in suspension with the steam and cannot form into "slugs" and overload the drainage system. Each dryer is bound to operate at its maximum efficiency, and the result will show in the maximum production of paper with the fewest number of "breaks" and the least practicable consumption of steam.

It is a well-known fact that any dryer when once freed of water will pass steam into the return header. A majority of the difficulties encountered in the successful drying of the sheet are traceable directly to this fact, and yet few paper mill operatives appreciate why this is so. Any of the old-time machine tenders can tell you that with machines having one common return header, the drying effect can be greatly increased by blowing the steam in this header directly to the atmosphere. The importance of the principle involved in this action can hardly be over-emphasized. Opening the return header to the atmosphere results in an immediate drop in the pressure in this header, and as a result water and air promptly leave the dryers and production is speeded up. As long as steam is allowed to accumulate in the return header the flow of condensation from the dryers will be sluggish(because the differential in pressure between the steam in the dryer and tion from the dryers will be sluggish because the difbecome zero. The problem involved, then, is to provide some means of preventing the accumulation of this steam in the header without resorting to anything so wasteful as blowing it to the atmosphere or the introduction of vacuum pumps with their necessary cold water injection into the return line.

Getting Effective Results.

The system here described accomplishes the removal of this steam without waste by a method of piping which utilizes it as a source of supply for the first dryers on the wet end of the machine. The condensing power of these dryers is considerably greater than that of the dryers on the calender end of the machine, inasmuch as the sheet comes to them very wet and cold, and as a result practically all the steam supplied to them is condensed. The accompanying drop in pressure creates a rapid circulation throughout the rest of the machine. Very little steam escapes into the separate return header of this wet section, and the part that does is condensed in the first dryer on the machine. This system provides a positive means of securing circulation throughout the rest of the machine. Very little steam escapes into the separate return header of this wet end section, and the part that does is condensed in the first dryer on the machine. This system provides a positive means of securing circulation throughout the rest of the machine. Circulation means the maintenance of uniform heating conditions in all the dryers, with all the benefits that result therefrom.

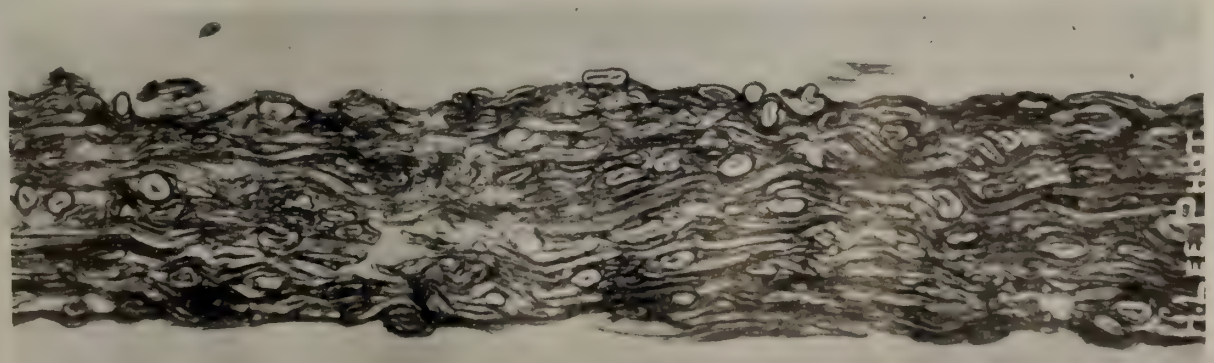
Economy of steam consumption is inseparably linked with maximum production as a factor in determining the commercial success of any mill. Maximum production can be, and often is, attained in ways that take no account of the coal pile. For instance, the method of blowing the steam in the return header of the paper machine to the atmosphere will give maximum production from that machine, but the result when viewed from the standpoint of economy is lamentable. Of recent years the increasing cost of fuel has compelled most mills to place a severe check upon the use of steam and steam power.

The paper machine is probably the largest single user of steam in any mill, and, unfortunately, the one whose economy has been least developed. The day has passed, however, when it can be further neglected. There is no excuse for any machine using more than three pounds of steam per pound of paper made. Whatever system of steam supply and condensation removal is installed, one of the primary factors considered should be economy.

Waste Is Eliminated.

The method of using the steam exhausted by the dryers on the calender end of the machine, eliminates the possibility of any waste of the steam charged to the machine. No vacuum pumps are used on the return headers and thus the use of large quantities of cooling water is avoided. Since the entire system is a closed one, and the necessary differentials of pressure between dryers and return headers are maintained regardless of the initial steam pressure, it is entirely possible to run the entire machine under a vacuum, if the grade of paper being made warrants the use of low temperatures.

In this connection it may be noted that the maintenance of all the dryers at their maximum efficiency permits the use of pressures much lower than were hitherto considered necessary. If exhaust steam is used in the drying, the reduction in back pressure on the engines will be a factor of considerable importance from an economy standpoint. Furthermore, the use of metering traps to handle the condensation gives a positive check at all times on the amount of steam being used to dry the paper.



Paper is not as smooth as it feels, when viewed with the microscope. This is a magnified cross section. Drying is an important factor in getting a good surface.

Protecting the Paper Sheet.

To dry paper at the high speeds called for in modern practice, it is necessary that the drying operation be so conducted as to avoid the possibility of lessening the strength of the sheet. It is indisputably true that the sudden application of high temperatures to the wet sheet of paper as it passes over the dryers seriously weakens the strength of the cellulose fibers in the sheet. The most noticeable result of this weakening is numerous "breaks" and an appreciable decrease in the daily production of paper. The only way to eliminate these harmful effects of high temperature is so to graduate the temperatures throughout the machine that the coldest and wettest paper will be subjected to lower temperatures than the partially dried sheet.

If it were possible to carry each dryer at a different pressure than its fellow so that the temperature of the first wet end dryer would be the lowest in the entire machine and that of the last one on the calender end the highest, we would have the ideal condition for gradual drying. Such a condition is practically impossible to attain, but it is possible to approximate it very much more closely than the average paper machine does.

Temperature Automatically Graduated.

One of the inherent features of the Crane System, due to its method of splitting the machine into three sections, is an automatic graduation of temperature from high at the calender end to low at the wet end. The last section of the machine, at the calender end, is supplied with either live or exhaust steam at the will of the operators. The middle section receives exhaust steam only. The return steam from both these sections is used as the supply for the wet end section.

This method of piping automatically insures that the wet end of the machine will always be at a lower pressure than the dry end. By splitting up the remainder of the machine into two sections, flexibility of control is secured, which enables the operators to meet any of the exacting demands of accurate drying.

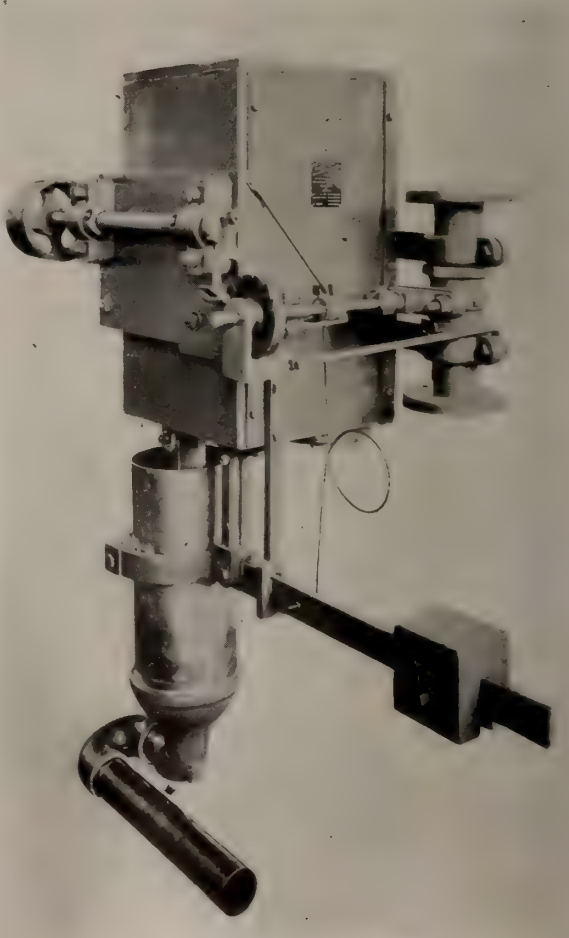
In practice the highest pressure, and therefore the highest temperature, is carried in the calender end section, with a drop of from two to four pounds in pressure between it and the middle section. In turn, there is a drop of from 2 to 4 pounds between the middle and the wet end sections. Thus, graduation of temperature is assured and with it the certain elimination of any possibility of ruining the sheet by subjecting it to high temperatures suddenly.

This system is neither an experiment nor a panacea for all the ills encountered in the process of drying paper. It is a common-sense application of the principles of steam engineering to the problem of securing maximum efficiency from the dryers of a paper machine. The success which has attended its installation in many of the largest mills in the country has demonstrated its worth as an aid in increasing production, improving the quality of the product and decreasing the steam consumption per pound of paper made.

There is nothing difficult to understand in the system, either in its principle or operation. It has been developed by actual experience and plenty of hard knocks into a strikingly simple method of handling one of the most complex problems encountered in the whole process of manufacturing paper.



Mr. Wm. ANDERSON,
Superintendent, Kinleith Paper Mills,
St. Catherines, Ont.



Regulation of consistency of stock is an important factor in drying paper properly. The Trimbey Regulator is constantly controlling the consistency; if the stock is too thick, more water is added; if too thin, less water is added.

You Hard Headed BUSINESS MEN!



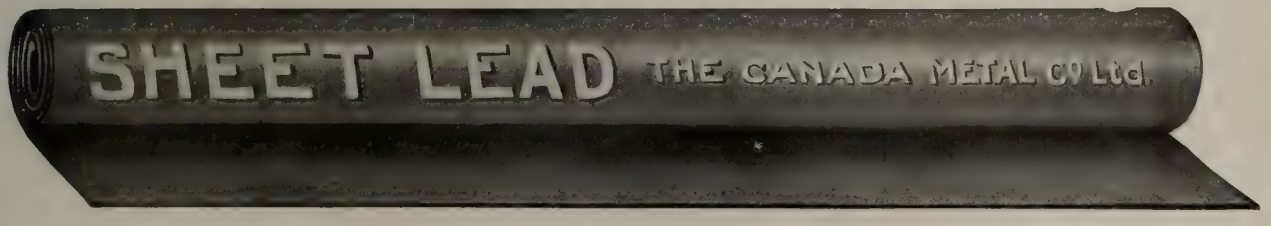
Remember that your ability to be an effective business man is dependent upon your open-mindedness.

WE MADE TO-DAY

1 Sheet of Five Pound Lead
48 Ft. Long by 8 Ft. Wide

The largest single sheet ever produced in Canada.

Our 12" Pipe is the largest, and our 1-16" Tube, the smallest Pipe made in Canada.
We make anything between these sizes.



Remember too we are specialists in the manufacture of

HIGH PRESSURE ANTIMONIAL LEAD PIPE

Very great care is taken in the manufacture and the pipe produced combines great rigidity and strength with high acid resisting properties. We make any size up to

Twelve Inches in Diameter

Ask us for prices on

BABBITT---SOLDER---LEAD PIPE---SHEET LEAD

THE CANADA METAL CO., Limited

HAMILTON MONTREAL TORONTO WINNIPEG VANCOUVER

Some Famous Devonshire China Clay Mines.

Quite recently it was my privilege to receive an invitation from the English China Clays, Limited, to visit their principal works in Devonshire. Having resided in the neighborhood of the extensive Cornish Clay mines for many years I had long wished to see the renowned china clay deposits of Devonshire, and particularly the Lee Moor mines belonging to the company. It was therefore with pleasure that I availed myself of the opportunity of gratifying my desire, and on a recent Saturday morning found myself and a companion in a comfortable automobile, driven by Mr. A. Davies, the Works Manager, spinning eastwards from St. Austell in the hope of arriving at Torpoint in time for the 9 a.m. ferry. The first stage of our tour, viz., Torpoint, was reached at 8.45, having accomplished the run at the rate of 25 miles an hour, an exceedingly good record for our Cornish hills. The Torpoint ferry is an important connection for the main Cornish traffic, and is now under the authority of the Cornwall County Council. Promptly at 9 a.m. we boarded te ferry, and later were soon speeding through Devonport to Plymouth, where we made a brief stay for early lunch. Thus far our journey had been through the almost indescribable scenery of East Cornwall, passing through wooded estates and sometimes skirting the River Fowey, St. Germans River and the Tamar at a time when nature was at its best. Before resuming our journey we met Mr. W. O. Meade King, the general manager of the Lee Moor Mines for English China Clays, Ltd., to whom we were introduced, and who accompanied us during our visit. Mr. Davies skilfully negotiated the dense traffic at Plymouth, and we were soon spinning through the pretty residential district of Plympton. From here to the slopes of Dartmoor there was a perceptible ascent, as the Lee Moor Mines are situated about 900 ft. above the level of the sea and form quite a prominent background ten miles to the north-east of Plymouth. Arriving at the entrance gate of the rugged fringe of Dartmoor, we soon had a fine panoramic view of the village of Lee Moor and the whole scene of operations of the great enterprise bearing its name. Descending a most declivitous and narrow road, our automobile was at last negotiating its steepest and final climb to the village of our destination. The families forming this sequestered community are accommodated, we found, in well-built cottages — erected by the firm — in rows on the side of the hill, all presenting a neat and well-ordered appeareance. In addition to their well-cultivated garden plots, the majority of the men who are employees of the firm have their allotments for a cow, a few pigs and poultry, while to meet their physical, mental and spiritual needs there are a co-operative store, a commodious reading room, a mixed elementary school, a flourishing Wesleyan Church, and a Church Mission Room.

We alighted first at Cholwichtown, where we inspected the kilns and air-drying linhays, which pratically form the highest operations of the firm on the side of the hill. Here we were struck with the various final stages of production. The micas and settling pits at the rear were connected by channels, and the dries were connected by the firm's own railway system. The railway to Laira, where the English China Clays, Ltd., have their own wharfing accommodation. is nine miles long, and from such an altitude as Lee Moor transport is naturally very difficult, the journey to and from Plymouth having to be accomplished in stages. At Lee Moor there is a double track incline, upon which the descending trucks pull up the empty wagons, and those laden with coals and other materials for the works. From the bottom of the incline to Cornwood, a distance of two miles, the locomotive is the drawing factor. From Cornwood, where there is another incline, to Laira, a distance of five miles, the firm are obliged to conform to the entire use of horses, as their private line has to penetrate three other important railways, including the main line of the Great Western. In addition to two locomotives, the English China Clays have about 50 horses, which are constantly employed in the transit of china clay and other materials to the port of exportation. At Laira the company have similar facilities for exporting as those found at Fowey, and are enabled to load great ocean-going steamers up to 10,000 tons at the Great Western Docks.

Whilst walking from the kilns across to Cholwichtown Pits, Captain Lot Hore, who has been associated with this particular locality many years, as had his father before him, directed our attention to the surrounding places of interest, including Cornwood, lying to the south-east; Trowelsworthy Tor, of interest to readers of Eden Phillpotts' thrilling novel of "The Three Brothers"; and the sand-hills of Hemerdon China Clay Works, which are also under the administration of the company. We next arrived at Cholwichtown Pit,



Inexhaustible supplies of world-renowned English China Clay.

uated at the base of a slope that terminates in the eminence well known locally as Shell-top. This deposit has which is contiguous to the Whitehill Yeo Pit, and sitbeen worked practically about 50 years, and contains clay of the very best grade found in this or any other country. Captain Hore, who carried a shovel with him, remarked, with pardonable pride, that there was no deception about Cholwichtown, and asked us to probe the mine wherever we liked, guaranteeing that we could only discover the very best clay. This mine produces a clay of a natural bluish tint, which is a guarantee of purity, and it was quite easy to discern these beauty spots all over the mine.

Reurning to our car, Mr. Davies next drove us to the famous Lee Moor Mine, where the operations of the company were precisely the same but on a more extensive scale. This pit, which covers an enormous area and is at present being worked at a depth of 300 ft., is probably the largest and most valuable in the world. The pioneers of this mine evidently foresaw the great commercial attributes of this deposit, so they constructed tunnels both at this and the Whitehill Yeo Pit to take away the streams of clay-laden water from the pits to the refining micas, eliminating the cost of pumping. A great factor in the successful working of a clay mine is an abundance of water, and in this particular the English China Clays, Ltd., are exceedingly fortunate. The firm have constructed a large reservoir, containing over four million gallons of spring water, which can be used when required, but ordinarily the supply is taken from the River Plym. With a modern installation of hydrants, the water is directed to the slopes of the pit, with the result that it becomes impregnated with the clay. The clay-laden water is then conveyed through the tunnels to the micas, which are a series of narrow channels running parallel to one another for a considerable distance, thus separating the clay from the mica. From these micas the clay water passes on to the settling pits, where after a period of rest it moves on to the final tanks, which are generally constructed alongside the kilns. The brands produced at Lee Moor mine are Lee Moor, C.T. X.X.X. (Treble X), which are universally known to the trade and unexcelled for the requirements of the potter and the paper manufacturer and for bleaching.

A hearty welcome having ben extended to us by Captain Bray, a sturdy Cornishman who has been in charge of the works for quite half a century, the micas and settling pits were the next objects of our inspection, and we were subsequently conducted through the long row of kilns, constructed on a principle that conduces to unusual economy and cleanliness. Here we found the product of lily white clay in convenient blocks ready for shipment. In addition to an enormous output of clay, the English China Clays are manufacturers of an immense quantity of fire bricks and tiles, and they have recently installed a plant for the manufacture of a special line of sand—lime bricks, for which there is a large demand. The Government, the Navy, large corporations and gas companies are among the firm's extensive clientele.

The company, we were told, had recently entered upon an engineering task of considerable magnitude, from which results of a far reaching character are anticipated. For years the power supplied for the whole of the work at Lee Moor has been produced by nine steam engines, and these are now being replaced by a generating power station, and the installation of two 4-cylinder "Premier" gas engines, with a capacity of over 250 horsepower each. These engines were acquired by the firm from the Government Disposal Board in February, 1920; they were in stock ready to be shipped by the authorities to France. They have been installed in a large, newly-erected power station 60 ft. by 40 ft. and 25 ft. high, and have been fixed by the firm's own engineering department with the most satisfactory results. The gas is produced by three Mond gas producers, and in connection with this plant there is a small auxiliary engine to supply the compressed air feed. This new power plant will eliminate the expensive working of nine steam engines and provide electricity for the lighting of the works and shops, the saw mills, winding, filter presses, and also for the public lighting of the village if convenient. In all, the "Sett" at Lee Moor covers an extensive area of nearly 3,000 acres, and active operations are carried on in about a mile radius. It will be seen that the English China Clays are the promoters of a very considerable business in Devon, as well as of their gigantic undertakings in Cornwall, which are being extended and developed every year.

To this article from the Paper maker and British Paper trade Journal we add the interesting

The Story of a Lump of China Clay.

What is the origin of this lump of brilliantly white clay? The geologist and the chemist must answer the question.

For untold ages, we are told, atmospheric agencies and acid-charged waters have acted unceasingly on large masses of the granite foundations of beautiful, rock-bound Cornwall, depriving us of good building material but providing in exchange a very valuable substance possessing an extraordinary range of uses.

Who would imagine that the lump of crumbly white clay, whose story we are trying to briefly relate, is the



SETTLING PITS AND KILNS AT LEE MOOR

Canadian Grinding PULPSTONES



Part of a recent shipment to Canada Paper Co. Ltd.
WE HAVE SUPPLIED THIS COMPANY REGULARLY FOR OVER 20 YEARS.

Magazine GRINDER STONES



Part of a recent shipment of Magazine Grinder Stones to Laurentide Co. Ltd.

DIRECT FROM MAKER TO USER.

The Miramichi Quarry CO., LIMITED

Quarryville, N.B.
Canada

Keep Canadian Money in Canada. Promote development of resources and increase national property by using Home Products.

decomposed and chemically-changed granite bed of England's Riviera? And how many realise that this same clay enters into the manufacture of dozens of widely diverse articles, from china to art printing paper, and from linoleum to tooth powder?

Our lump of clay is, of course, the fine white china clay—not a pipe clay and not the coarser clay that provides material for the manufacture of tiles, drainpipes and the like. Ours is the real Kaolin, the technical name which is merely a corruption of Kaoling (a cantonment in China) where the clay was first discovered and employed in the manufacture of porcelain or "china."

But the little lump of china clay, white as it looks when being rudely washed down the sides of the enormous pit, is by no means pure. It is full of foreign substances, mica, sand, etc., which have to be eliminated by repeated washings and the use of various mechanical appliances.

The final degree of whiteness and general utility is dependent upon the thoroughness and efficiency with which these cleansing processes are performed.

Our lump of clay has now lost its identity under the disintegrating effect of an abundance of the purest spring water — plenty of it and many changes — and is merged into an ever-flowing and milky-white stream. This stream of clay-charged water is strained and strained again until a copper gauze of 1,000 holes to the square inch is reached, through which only the very finest grains of the purest china clay can pass.

Some of the water is now drained off, leaving it just fluid enough to pass along the appointed channels to the kilns, where it is finally reduced to lumps of dazzlingly white and perfectly dry and clean china clay, possessing the desired properties for its many uses.

These lumps are stored in Linhays or lean-to covered platforms parallel with the railway siding, ready for prompt dispatch.

And to where with this highly purified china clay find its way? Why, to the pottery, the paper makers, the laboratory of the manufacturer of toilet powders, cosmetics, soaps and disinfectants, the factories where metal and boot polishes, paints, crayons, pencils and even fertilisers are made, and yet other centres of commercial industry.

The uses and applications are remarkable in their variety, and in many cases purity, whiteness and dryness are essentials; only the proper sources of supply, and experience and thoroughness in handling, will ensure these qualities.

English China Clays, Ltd., control the largest, most productive and finest china clay pits in England, and are equipped with the most up-to-date machinery.

The produce of English China Clays, Ltd. is shipped to all parts of the world.



Slash is the "garbage of the woods". It breeds disease and invites fire; it should be disposed of as a part of logging operations.



EZRA BUTLER EDDY
Born Aug. 22, 1827; Died Feb. 1906



PIONEERS

In every line of endeavor there are always those who blaze the trail.

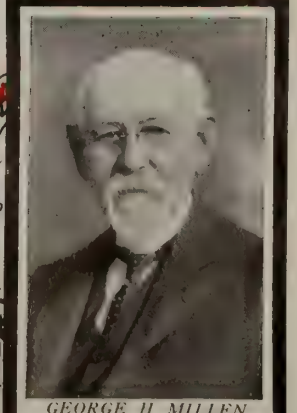
In the Canadian Match, Paper and Indurated Fibreware industry two names stand out pre-eminently as pioneers —the late EZRA BUTLER EDDY, founder of the E. B. Eddy Co., and Mr. George H. Millen, inventor and former business adviser of Mr. Eddy, now President of this world-famous firm. The story of how over seventy years ago, the late Mr. Eddy first began, the manufacture of matches, in a small barn where his daily output amounted to a few dozen boxes, up to to-day, when this output, under the guidance of his able successor, Mr. Millen, has increased to the astounding figures of over 350 million matches a week, as well as vast quantities of paper, paper products of all kinds and Indurated Fibreware, is one as interesting as a popular book of fiction. Eddy products are not only pioneers of quality, they are leaders in sales.

The trail these pioneers have blazed can well be pointed to with pride, for at each stage of development EDDY PRODUCTS maintained their leadership in sales and quality and the confidence of the Canadian people against the competition of the world.

The E. B. EDDY COMPANY, Ltd.

HULL, CANADA

Makers of Matches, Indurated Ware, Washboards, Paper and Paper Bag Products.



GEORGE H. MILLEN
President of the E. B. Eddy Co on whom E. B. Eddy's mantle fel.



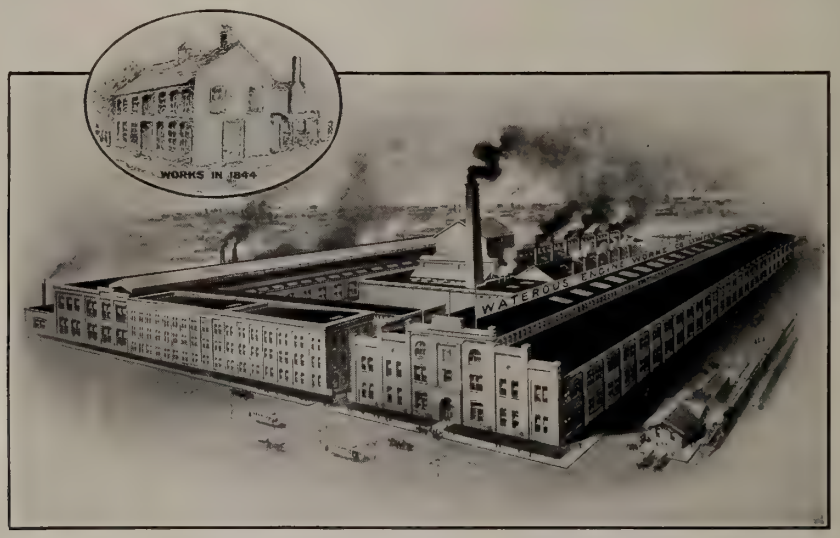
1921

The Waterous Engine Works Co., Ltd.

Deeply Rooted in the Industrial Fabric of Canada, this Long-Established Brantford Company Sends its Products from one End of the Dominion to the Other.

By A. R. R. JONES.

Starting in a small way, three quarters of a century ago, in the manufacture principally of stoves and ploughs, the Waterous Engine Works Company, Ltd., of Brantford, Ont., has gradually extended not merely its premises and plant, but its whole sphere of operations, until its products are to be met with from Halifax to Vancouver. Its record during all those years has been one of sustained progress and expansion. First, the stoves and ploughs, then threshing machines and saw mills. In process of time, boilers, steam engines, fire engines, heavy fire apparatus, brick machinery, steam rollers, wood-pulp machinery—in fact, pretty nearly everything that comes within the scope of machinery manufactures — were added to its output.



From small beginnings, the Waterous Works show remarkable growth.

It was in the year 1844, that the business, which is now known as the Waterous Engine Works Company, Ltd., was started by Mr. P. C. Van Brocklin. Four years later, the late Mr. Charles H. Waterous became interested in the concern. As the business went briskly ahead from its very inception, extensions, in the way of both buildings and equipment, were constantly taking place, until the arrival of a day when the plant occupied more than half a city block and extensions were no longer physically possible. That was in the year, 1895. In that year, it was decided to remove to the present location on South Market Street, Brantford, where there was plenty of room for expansion and where good railway connections were available. Hence the plant which the Company now occupies was erected on this site. It covers an area of some twenty-five acres, and, when working full time, the concern affords employment to some 500 men.

The chief officers of the Company today are the following: Mr. C. H. Waterous, president and general manager; Mr. D. J. Waterous, vice-president and secretary; Mr. C. A. Waterous, assistant general manager; Mr. Walter T. Mair, treasurer; and Mr. L. M. Waterous, in charge of sales. The continuity of policy that has resulted from the Waterous family having control of the business over such a long period of years has been of inestimable advantage in nearly every direction. Those who buy the Company's products know with whom they are dealing, and that the name "Waterous" is a guarantee of unimpeachable quality in the products that bear it.

The Lines Specialized In.

As has been indicated, the Company first specialized in stoves and other small wares. But it soon drifted out of the manufacture of these, and took up the manufacture of engines, boilers and saw-mill machinery, as its principal lines. Later, it added to these, agricultural engines of a type which speedily acquired a wide popularity, and of which it sold very large numbers throughout the country. From time to time, as the markets have warranted the Company has taken up new lines, and among those in which it does a very extensive business may be mentioned the following: First, saw-mill machinery. This is one of the Company's oldest lines for both domestic and export trade. Secondly, steam fire engises, of which there are large numbers in all the big Canadian cities, and which are also in extensive use in foreign fields. Thirdly, all types of boilers, marine and stationary, and tank work of the very highest grade. The Company's large and admirably equipped boiler shops are ideal for the purpose of turning out this class of work. Fourthly, high grade automatic high speed engines for electric light and other purposes. Fifthly, road-making machinery and steam road rollers. Sixthly, pulp mill machinery. In this, the Company does a very big business, including all classes of machines for the preparing of wood and wood pulp covering barkers, cutting up rigs, screens, wet machines grinders, centrifugal pumps and so forth. Proofs of the excellence of its work in this branch can be seen an every hand in some of the largest mills in the Dominion, which are fitted throughout with Waterous grinders, screens, rossers, semi-automatic cut-off saws, conveyors and so on, all of the latest type. In a number of small lines too, the Company has earned a well-merited reputation for efficiency in its work and reliability in its products.

Size of the Main Building.

As mentioned above, the present plant was laid down, in 1895. The main building is, in size 300 ft. by 120 ft. In addition to it there are also boiler, blacksmith, moulding and other shops, all of suitable proportions. At the



Work in process of manufacture in the modern machine shop.

end of the main building, facing Market Street, are the offices which form a spacious and handsomely-appointed structure. On the first floor are the drafting room and superintendent's office, having convenient access to the main shop and other departments. On the second floor is the general office, a model of convenient arrangement and completeness of commercial equipment. On the third floor are located the blue print room and photographic department. The services which these departments render are indispensable for record and publicity work, in view of the constant improvements and additions to the products.

The Admirable and Modern Foundry.

Since 1895 when the present plant was begun, many additions have been made to it. Some nine years ago, it was found necessary to build a new and up-to-date foundry. by reason of the fact that the one formerly in use was not capable of turning out the heavy tonnage of castings necessary to keep the machine shop and other departments fully occupied. Accordingly, a foundry with a very greatly increased capacity was constructed.

As the cost of handling raw and finished material is always a large item of expense, this new foundry was designed with special reference to inter-departmental transportation facilities, and the most modern of equipment, permitting of the handling of all material in the most economical manner, was installed. The foundry is on the north side of the plant and parallel with the machine shop, the old foundry being at right angles and connecting the two departments. The old foundry has been converted into a cleaning room, finished store room and pattern shop. In this way, the rough castings pass by consecutive stages, and by the shortest possible route, from molding floor to machine shop.

The foundry, which is of fire-proof construction throughout, with self-supporting steel frames and brick curtain walls, is 240 feet long by 110 feet wide, with an extension measuring 68 feet by 30 feet in the north west corner, for the core ovens. The centre bay is 50 feet wide, and there are two side bays 30 feet in width, that on the north side having a gallery overhead which accommodates the sand and coke storage bins, brass foundry and so on. The main bay is used for floor molding and the production of the heavier types of castings. The head room to the bottom chord of the roof truss is 30 ft. 9 in., while 7 ft. 6 in. lower are the crane rails which carry a 15 ton, 3 motor Northern electric traveling crane. This crane serves the full length of the main bay and, through swinging doors at the end of the building, has access to a further 120 ft. of track, where heavy flasks and other foundry equipment are stored. The south 30 ft. bay is used for the smaller floor work. It has a height to the roof trusses of 18 ft. and of 14 ft. to the top of the crane rails. The crane here has a span of 26½ ft. and a capacity of 5 tons. The north 30 ft. bay accommodates the core makers, bench molders, cupola room and so on, while its east end is used for small floor work and is served by a 5 ton traveler.

The foundry, as a whole, is remarkable not merely for its excellence of equipment and arrangement, but also for its exceptional lighting and ventlation.

Boiler Shop and Power House.

The Waterous Engine Works Company, Ltd., enjoys not merely a Dominion-wide, but even a world-wide, reputation for the manufacture of boilers of a very wide range. The boiler shop is, accordingly, very completely equipped with planing machines, bending rolls, tube hole cutters, hydraulic and pneumatic tools and other appliances calculated to enable the heavy output of work in this department to be produced in a manner which can only be characterized as exemplary. The return tubular boiler enjoys considerable popularity because of its simplicity of design. A very complete range of locomotive type boilers is produced, from 25 to 150 horsepower, the largest size having an over-all length exceeding 23 ft., with a shell diameter of 66 in., and suited for steam pressure of from 125 lbs. to 175 lbs per



The well equipped Waterous foundry.

square inch, according to size and specification. Plain grates and shaking and dumping grates are supplied to suit any variety of fuel.

As engine builders, the Company naturally develops its own supply of energy, both mechanical and electrical. The main shop drive is by belt from a steam engine of the Ridgway Corliss type. Hydraulic power is obtained from a duplex steam driven plunger pump and pneumatic power from a Blaisdell and a Franklin air-compressor. The power house consists of boiler house and engine room.

Other highly important departments of the plant are the smiths' shop; the machine shop, the tool room; the erecting department; the test floor; the pattern shop; and the finishing and painting department.

The Company is a Canadian concern—one in which Canada does well to take pride, alike in its enterprise and in its magnitude. A notable feature about the plant, as affording evidence of the Company's robust Canadianism, is that a very large proportion of the tools installed are Canadian-made. These include planers, boring mills, horizontal borers, millng machines and medium and large engine lathes. The production of small parts in quantity is carried out on a number of screw machines, turret lathes and similar specialized tools.

It should be added that the Company's shipping facilities are of the best. The railroads run sidings right into the centre of the factory.

Victoria Paper and Twine Co., Ltd.

The Victoria Paper and Twine Co. Ltd, with head offices and warehouse on Wellington Street West, Toronto, has for its main lines the following: wrapping papers, twines, tissues, toilet papers, Northern towels, paper bags, box-boards, building papers, etc., parchment paper, greaseproof paper, wax paper and aper specialities. Its Montreal house, where five salesmen are employed, is under the management of Mr. Sydney

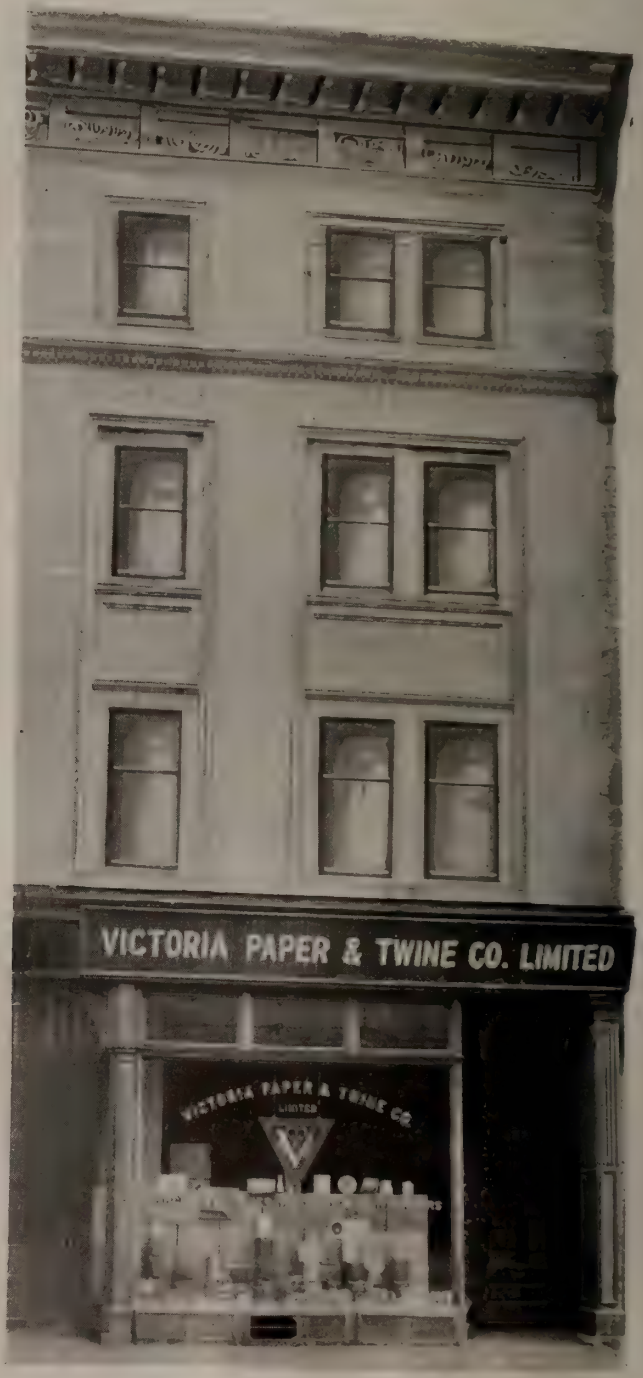


Chas. V. Syrett,
Managing director, Victoria Paper & Twine Co. Ltd.

W. Ewing. It has also a selling office located at Halifax, N.S., of which Mr. Alexander McRae is in charge.

The business being done by this progressive concern is thoroughly satisfactory, a fact which may be largely attributed to what may be called its wise fortification of its lines. For it has always adopted the policy of working with the mills. Mr. Charles W. Syrett is secretary and managing director and two active salesmen — Messrs. Leo E. Charles and Charles S. Nicholls—are also on the directorate. It may be added that, at the annual meeting of the Canadian Paper Trade Association, held at Montreal, recently, Mr. Syrett was appointed chairman of its Coarse Paper Division.

The Company enjoys the distinction of having been the pioneer in placing kraft paper on the market in Canada.



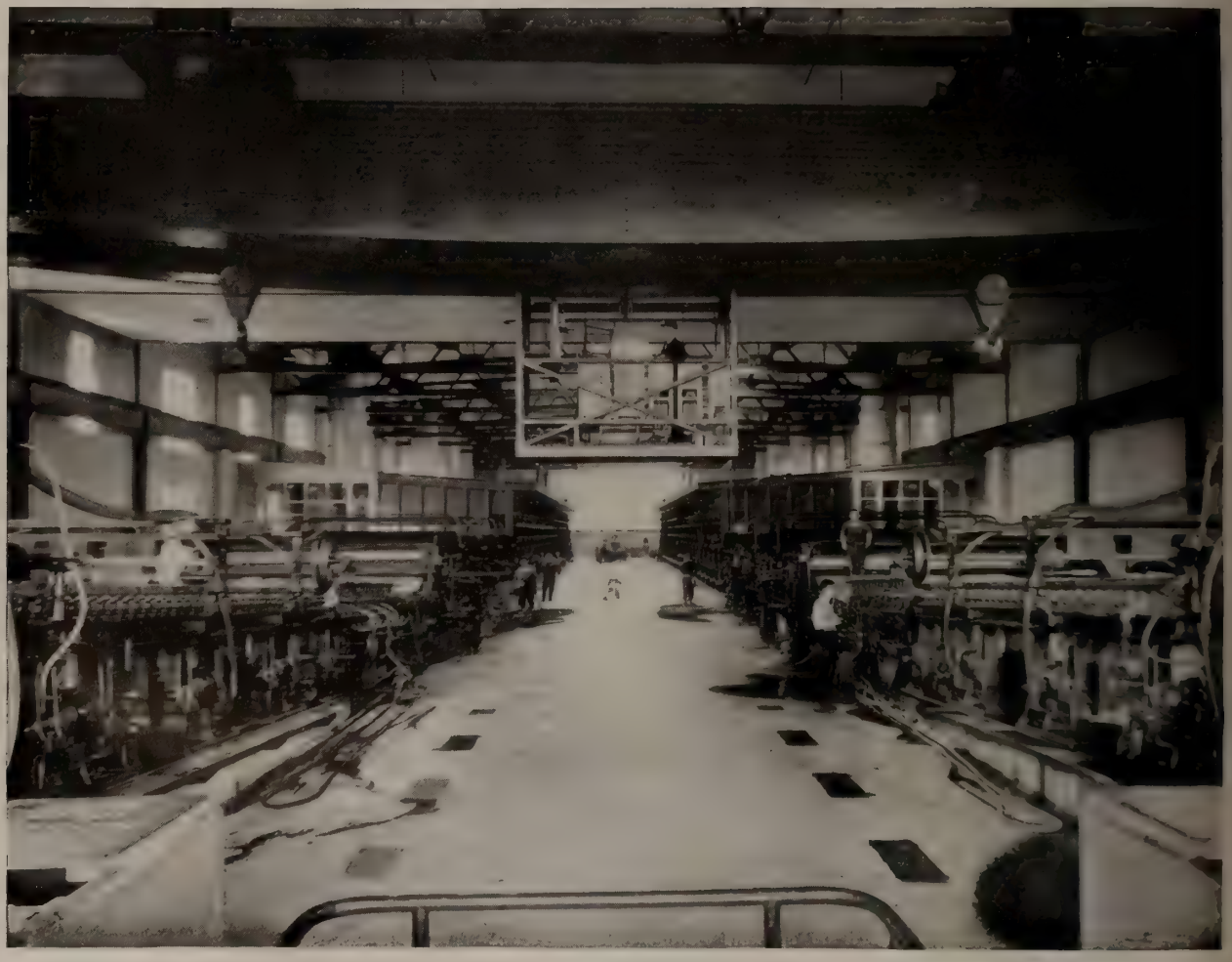
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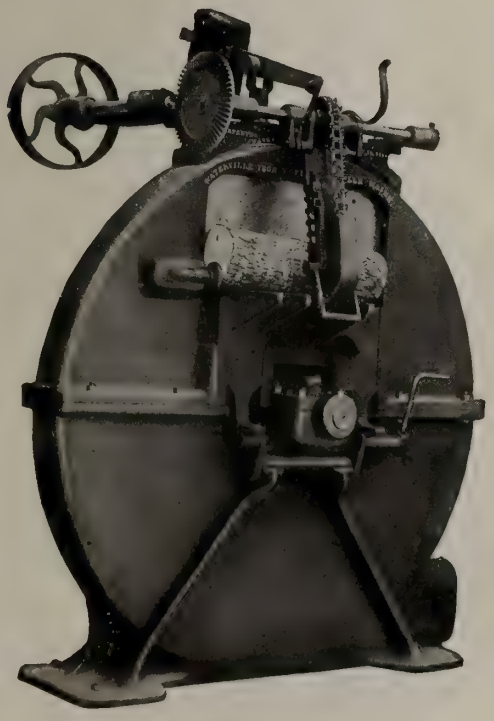
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Biggs Boiler Works Co., The.
Can. Des Moines Steel Co.
Can. Chicago Bridge & Iron Co., Ltd.
Horton Steel Works, Ltd.

Gauges:
Canadian-Fairbanks-Morse Co., Ltd.
Foxboro Co., Inc.
McAvity, T. & Son.
The Mason Regulator & Eng. Co.
Perkins, B. F. & Son, Inc.

Gears:
Canadian Allis-Chalmers, Ltd.
Canadian Mead-Morrison Co., Ltd.
Canadian-Fairbanks-Morse Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Canadian Link-Belt Co., Ltd.
Diamond State Fibre Co. of Can., Ltd.
Dominion Engineering Works, Ltd.
Goldie & McCulloch Co., Ltd.
Hamilton Co., Ltd., Wm.
Hydraulic Machinery Co., Ltd.
Northern Foundry & Machine Co.
Smart-Turner Machine Co., Ltd.
Victoria Foundry Limited.
Waterous Engine Works Co., Ltd.

Generators:
Northern Electric Co., Ltd.
The Harland Engineering Co. of Canada, Ltd.
Sturtevant, B. F. Co. of Canada, Ltd.

Glassine Calenders:
Norwood Engineering Co.

Glues:
McArthur, Irwin, Ltd.

Grate Bars:
Beveridge Supply Co., Ltd.
The Mason Regulator & Eng. Co.
Victoria Foundry Co., Ltd.
Goldie & McCulloch Co., Ltd.
Hamilton, William Co., Ltd.
Northern Foundry & Machine Co.
Waterous Engine Works Co., Ltd.

Grindstones:
Cleveland Stone Co.
International Pulp Stone Co.
Lombard & Co.
Imperial Trading Co.
Miramichi Quarry Co.
Smallwood Stone Co.
Smallwood-Low Stone Co.

Grinders:
Canadian Ingersoll-Rand Co., Ltd.
Carthage Machine Co.
Eng. & Machine Works of Can., Ltd.
Northern Foundry & Machine Co.
Port Arthur Shipbuilding Co., Ltd.
Walsh Plate & Structural Works, Ltd.
Waterous Engine Works Co., Ltd.

Hangers:
Can. Allis-Chalmers, Ltd.
Canadian-Fairbanks-Morse Co., Ltd.
Carthage Machine Co.
Goldie & McCulloch Co., Ltd.
Hydraulic Machinery Co., Ltd.
Port Arthur Shipbuilding Co.,Ltd.
Northern Foundry & Machine Co.
Victoria Foundry, Ltd.
Waterous Engine Works Co., Ltd.

Heaters—Feed Water:
Canadian Allis-Chalmers, Ltd.
Darling Bros., Ltd.
Mason Regulator & Eng. Co., The
Sturtevant, B. F. Co., of Canada, Ltd.

Heating and Ventilating:
B. F. Sturtevant Co. of Canada, Ltd.

Hoists:
Canadian Allis-Chalmers, Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Mead-Morrison Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Canadian Link-Belt Co., Ltd.
Hamilton, William Co., Ltd.
Northern Crane Works, Ltd.
Victoria Foundry, Ltd.

Hoods—Paper Machine:
Canadian Allis-Chalmers, Ltd.
Taylor, Ltd., H. S.
Williams Apparatus.

Hydrants—Fire and Mill Yard:
Norwood Engineering Co.

Hydraulic Presses:
Hydraulic Machinery Co., Ltd.
Northern Foundry & Machine Co.
Waterous Engine Works Co., Ltd.

Instruments—Testing:
Foxboro Co., Inc.
Northern Electric Co., Ltd.
Perkins, B. F .& Son, Inc.



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MILL SUPPLIES.—Continued.

Insulation:
Can. Johns-Manville Co., Ltd.
Northern Electric Co., Ltd.

Iron Castings:
See Castings:

Jordan Engines:
Emerson Mfg. Co.
Jones, E. D. & Co., Inc.
Hamilton, William Co., Ltd.
Port Arthur Shipbuilding Co., Ltd.
Process Engineers, Ltd.

Jordan Fillings:
J. W. Bolton & Sons, Inc.
Jones & Sons Co., E. D.
Pulp & Paper Mill Accessories, Ltd.
Tippet & Co., Ltd.

Knife Grinders:
Gibbs-Brower Co.
Carthage Machine Co.

Governors:
St. Lawrence Welding & Engineering Works, Ltd.

Grate Bars:
The Mason Regulator & Eng. Co.
Northern Foundry & Machine Co.
Victoria Foundry, Ltd.
Waterous Engine Works Co., Ltd.

Kettles—Stoneware, Acid Proof:
Knight, Maurice A.

Knives:
J. W. Bolton & Sons, Inc.
Can. Des Moines Steel Co,, Ltd.
Canadian Fairbanks--Morse, Co., Ltd.
Carthage Machine Co.
Disston, H. & Sons, Ltd.
Galt Knife Co., Ltd.
Hamblet Machine Co.
Peter Hay Knife Co., Ltd.
Pulp & Paper Mill Accessories, Ltd.
Tippet & Co.
Vulcan Iron Works
Waterous Engine Works Co., Ltd

Knives Paper Cutting:
Disston, H. & Sons, Ltd.
Galt Knife Co., Ltd.
Hamblet Machine Co.
Peter Hay Knife Co., Ltd.
Pulp & Paper Mill Accessories, Ltd.
Reid, C. De Wolf.

Kollergangs:
Bertrams, Ltd.
Boving Hydraulic & Eng. Co., Ltd.

Lamps—Electric:
General Electric Co., Ltd.
Harland Engineering Co., Ltd.
Northern Electric Co., Ltd.

Laboratory Equipment:
Perkins, B. F. & Son, Inc.

Lath Machines:
Victoria Foundry, Ltd.

Lead Burning:
Barber, W. J. & Co.
St. Lawrence Welding Co.

Lead Goods:
The Canada Metal Co., Ltd.
McAvity, T. and Son.
Jas. Robertson Co., Ltd.

Locomotives:
Canadian Allis-Chalmers, Ltd.
Fraser & Chalmers, Canada, Ltd.
Jno. J. Gartshore.
Gilman, R. T. & Co.
Montreal Locomotive Works, Ltd.

Lubricants:
Hinshelwood & Co., Ltd.
Imperial Trading Co.

Lubricating Graphite:
Dominion Paint Works, Ltd.

Lubricators:
Canadian Fairbanks-Morse Co., Ltd.
Darling Bros., Ltd.
Fraser & Chalmers, Canada, Ltd.
Imperial Trading Co.
McAvity, T. & Son.

Matches:
E. B. Eddy Co., Ltd.

Machine Tools:
Canadian Fairbanks-Morse Co., Ltd.
Victoria Foundry, Ltd.

Mechanical Draft:
The Mason Regulator & Eng. Co., Ltd.
Sturtevant, B. F. Co., of Canada, Ltd.
Foxboro Co., Inc.
The Mason Regulator & Eng. Co.
Peacock Bros., Ltd.

Motors:
Canadian Allis-Chalmers, Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Canadian General Electric Co., Ltd.
Giddings, A. A. & Co., Ltd.
Harland Engineering Co., Ltd.
Northern Electric Co., Ltd.
Sturtevant, B. F. Co., of Canada, Ltd.

Meters—Steam:

Mill Brokers:
Can. Woodlands & Pulpwood Agency
Gibbs-Brower Co., Inc.

Motor Drives—Individual, Sectional:
Can. General Electric Co., Ltd.
Can. Westinghouse Co., Ltd.
Harland Eng. Co., Ltd.

Oil:
The Barrett Co., Ltd.

Oxy-Acetylene Welding and Supplies:
Walsh Plate & Structural Works, Ltd.

Packing:
Beveridge Supply Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.

Paints:
Barrett Co., Ltd.
Dominion Paint Works, Ltd.
Ramsay& Co., A.
McArthur, Irwin, Ltd.

PAPER AND PULP

Bonds—Bristols, Ledgers, Writing:
Beveridge Supply Co., Ltd.
E. B. Eddy Co., Ltd.
Howard, Smith Paper Mills, Ltd.
Interstate Pulp & Paper Co., Inc.
Kinleith Paper Mills, Ltd.
Provincial Paper Mills Co., Ltd.
Rolland Paper Co.
Rolland Paper Co., Ltd.
Toronto Paper Mfg. Co., Ltd.

Book and Coated:
Beveridge Supply Co., Ltd.
Interstate Pulp & Paper Co., Inc.
Kinleith Paper Mills, Ltd.
Provincial Paper Mills Co., Ltd.
Rolland Paper Co., Ltd.
Toronto Paper Mfg. Co., Ltd.

Boxboard:
Acer, J. H. A. & C.., Ltd.
Beveridge Supply Co., Ltd.
Brompton Pulp & Paper Co.
Canada Paper Board Co.
Eddy, E. B. & Co.
Price Bros. & Co. Ltd.
Reid, C. De Wolf.

Genuine Vegetable Parchment:
Can. Vegetable Parchment Co., Ltd.
Garden City Paper Mills Co., Ltd.
Victoria Paper & Twine Co., Ltd.

Greaseproof Paper:
Beveridge Supply Co., Ltd.
Can. Vegetable Parchment Co., Ltd.
Diamond State Fibre Co., of Can., Ltd.
Garden City Paper Mills Co., Ltd.
Victoria Paper & Twine Co., Ltd.

Kraft Paper:
Acer, J. H. A. & Co., Ltd.
Beveridge Supply Co., Ltd.
Brown Corporation.
Bathurst Lumber Co., Ltd.
Brompton Pulp & Paper Co., Ltd.
Dryden Pulp & Paper Co., Ltd.
M. Gottesman & Co., Inc.
Price & Pierce, Ltd.
Victoria Paper & Twine Co., Ltd.
Wayagamack Pulp & Paper Co., Ltd.

Mill Wrappers:
Acer, J. H. A. & Co., Ltd.
Brompton Pulp & Paper Co., Ltd.
Eddy, E. B. & Co., Ltd.
Price Bros & Co., Ltd.

Newsprint:
Abitibi Power & Paper Co., Ltd.
Beveridge Supply Co., Ltd.
Belgo-Canadian Pulp & Paper Co.
Brompton Pulp & Paper Co., Ltd.
E. B. Eddy Co., Ltd.
J. Ford & Co.
Interstate Pulp & Paper Co., Inc.
Laurentide Co., Ltd.
Patton, J. F., Inc.
Price Bros & Co., Ltd.
Spanish River Pulp & Paper Mills.
St. Maurice Paper Co.

Roofing:
Beveridge Supply Co., Ltd.
Brompton Pulp & Paper Co., Ltd.
Dryden Pulp & Paper Co., Ltd.
J. Ford & Co.
Interstate Pulp & Paper Co., Inc.
Spanish River Pulp & Paper Mills.

Specialties:
Beveridge Supply Co., Ltd.
Diamond State Fibre Co., of Can., Ltd
Can. Nashua Paper Co., Ltd.
Can. Vegetable Parchment Co., Ltd.
Garden City Paper Mills Co., Ltd.
Interstate Pulp & Paper Co., Inc.
Price Bros & Co., Ltd.
Smith Howard Paper Mills.
Victoria Paper & Twine Co., Ltd.

Wrapping:
Beveridge Supply Co., Ltd.
Brompton Pulp & Paper Co., Ltd.
Can. Vegetable Parchment Co., Ltd.
Davies & Royle
Dryden Pulp & Paper Co., Ltd.
E. B. Eddy Co., Ltd.,
Garden City Paper Mills Co., Ltd.
Interstate Pulp & Paper Co., Inc.
Interlake Tissue Mills Co., Ltd.
Spanish River Pulp & Paper Mills.
Victoria Paper & Twine Co., Ltd.
Wayagamack Pulp & Paper Co., Ltd.

Tissue and Toilet:
Beveridge Supply Co., Ltd.
Can. Vegetable Parchment Co., Ltd.
E. B. Eddy Co., Ltd.
Garden City Paper Mills Co., Ltd.
Interlake Tissue Mills Co., Ltd.
Interstate Pulp & Paper Co., Inc.
Victoria Paper & Twine Co., Ltd.

Groundwood Pulp:
Abitibi Power & Paper Co., Ltd.
Acer, J. H. A. & Co., Ltd.
American Woodpulp Corp.
Becker & Co.
Belgo Canadian Pulp & Paper Co.
Brompton Pulp & Paper Co., Ltd.
Chicoutimi Pulp Co.
Churchill & Sim
Donnacona Paper Co.
M. Gottesman & Co., Inc.
Interstate Pulp & Paper Co., Inc.
Laurentide Co., Ltd.
Lagerloef Trading Co., Inc.
Nordling Mace & Co.
Parsons & Whittemore, Inc.
Price Bros. & Co., Ltd.
Relph, Darwen & Pierce
St. Maurice Paper Co.
Scandinavian American Trading Co.
Spanish River Pulp & Paper Mills.

Lumber and Wood Products:
Brompton Pulp & Paper Co.
Brown Corporation.
Eddy, E. B. Co., Ltd.
Price Bros & Co., Ltd.
Riordon Sales Co., Ltd.

Parchment:
Can. Vegetable Parchment Co., Ltd.
Garden City Paper Mills Co., Ltd.
Victoria Paper & Twine Co., Ltd.

Soda Pulp:
Becker & Co.
M. Gottesman & Co., Inc.
Interstate Pulp & Paper Co., Inc.
Parsons & Whittemore.
Riordon Sales Co., Ltd.

Sulphate Pulp (Kraft):
American Woodpulp Corp.
Bathurst Lumber Co., Ltd.
Becker & Co.
Brompton Pulp & Paper Co., Ltd.
M. Gottesman & Co., Inc.
Dryden Pulp & Paper Co., Ltd.
Interstate Pulp & Paper Co., Ltd.
Lagerloef Trading Co., Inc.
Parsons & Whittemore, Inc.
Wayagamack Pulp & Paper Co., Ltd.

Sulphite Pulp :
Abitibi Power & Paper Co., Ltd.
Acer, J. H. A. & Co., Ltd.
American Woodpulp Corp.
Bathurst Lumber Co., Ltd.
Becker & Co.
Belgo Canadian Pulp & Paper Co. Ltd.
Churchill & Sim
Donnacona Paper Co.
Ha Ha Sulphite Co., Ltd.
St. Lawrence Pulp & Lumber Co., Ltd.
M. Gottesman & Co., Inc.
Interstate Pulp & Paper Co., Ltd.
Lagerloef Trading Co., Inc.
Laurentide Co., Ltd.
Mattagami Pulp & Paper Co., Ltd.
Parsons & Whittemore, Inc.
Price Bros. & Co., Ltd.
Riordon Sales Co., Ltd.
Spanish River Pulp & Paper Mills. Ltd.
St Maurice Paper Co.
Smith Howard Paper Mills.
Toronto Paper Mfg. Co., Ltd.

MILL SUPPLIES.—Continued.

Sulphite Mitscherlich:
Acer, J. H. A. & Co., Ltd.
American Woodpulp Corp.
Pulp & Paper Trading Co.

Paint:
The Barrett Co., Ltd.
Beveridge Supply Co., Ltd.

Paper Bags:
Beveridge Supply Co., Ltd.
E. B. Eddy Co., Ltd.
Victoria Paper & Twine Co., Ltd.

Packing:
Can. Johns-Manville Co., Ltd.

Paper Cores:
Elixman Paper Core Co.

Paper Cutting Machines:
Walmsley, Charles & Co., Ltd.

Paper Genuine Vegetable Parchment:
Beveridge Supply Co., Ltd.

Paper and Pulp Machinery:
Bertram, James & Son, Ltd.
Bertrams, Ltd.
Biggs Boiler Works Co.
Black-Clawson Co.
Boving Hydraulic & Eng. Co., Ltd.
Canadian Allis-Chalmers, Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Carthage Machine Co.
Dominion Engineering Works, Ltd.
Downingtown Mfg. Co.
Emerson Mfg. Co.
Farrel Foundry & Machine Co.
Fraser & Chalmers, Can., Ltd.
Hamilton Co., Ltd., Wm.
Hydraulic Machinery Co., Ltd
Jones, E. D. & Sons.
Johnson C. H. & Sons.
Norwood Engineering Co.
MacKinnon Steel Co., Ltd.
McAvity & Sons, Ltd., T.
Marx, J. & Co.
Mills Works & Machinery, Ltd.
Morrison, J. L. Co.
Port Arthur Shipbuilding Co., Ltd.
Perkins, B. F. & Son, Inc.
Pulp & Paper Mill Accessories, Ltd.
Process Engineers, Ltd.
Reid, Cl de Wolf.
Pusey & Jones Co.
Sandy Hill Iron & Brass Works.
Scott, Ernest & Co.
Sherbrooke Machinery Co., Ltd.
Smith, Morgan Co.
Stebbins Eng. & Mfg. Co.
St. Maurice Paper Co.,
Ticonderoga Machine Works.
Toronto Type Foundry Co., Ltd.
Vulcan Iron Works, Ltd.
Walsh Plate & Structural Works, Ltd.
Walmsley, Chas. & Co.,
Waterous Engine Works, Co., Ltd.
Westbye, P. P.

Paper, & Pulp Mill Brokers:
Gibbs-Brower Co.

Paper Testers:
Canadian Fairbanks-Morse Co., Ltd.
Perkins, B. F. & Sons, Inc.
Williams Apparatus Co.
Waterous Engine Works, Co., Ltd.

Penstocks:
Canadian Allis-Chalmers, Ltd.
Can. Chicago Bridge & Iron Co., Ltd.
Dominion Engineering Works, Ltd.
Horton Steel Works, Ltd.
Hamilton, William Co., Ltd.
MacKinnon Steel Co., Ltd.
Walsh Plate & Structural Works, Ltd.
White, W. H.

Penstocks, Wood Stave:
Pacific Coast Pipe Co., Ltd.
White, W. H.

Pillow Blocks:
Canadian Allis-Chalmers, Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Port Arthur Shipbuilding Co., Ltd.
Victoria Foundry Co., Ltd.
Waterous Engine Works, Co., Ltd.

Pipes:
Tallman Brass & Metal Co., Ltd.

Piping—High Pressure:
Canadian Fairbanks-Morse Co., Ltd.
Canadian Kellogg, Co., Ltd.
Crane, Ltd.
McAvity & Sons, Ltd., T.
Northern Foundry & Machine Co.
Port Arthur Shipbuilding Co., Ltd.

Piping Hydraulic:
Canadian Fairbanks-Morse Co., Ltd.
Canadian Kellogg Co., Ltd.
Dodge Manufacturing Co.
Hydraulic Machinery Co., Ltd.
Port Arthur Shipbuilding Co., Ltd

Plate and Tank Works:
Can. Des Moines Steel Co., Ltd.
Canadian Allis-Chalmers, Ltd.
Candian Ingersoll-Rand Co., Ltd.
Can. Chicago Bridge & Iron Co., Ltd.
Dominion Engineering Works, Ltd.
Goldie & McCulloch Co., Ltd.
Hamilton, William Co., Ltd.
Horton Steel Works, Ltd.
MacKinnon Steel Co., Ltd.
Port Arthur Shipbuilding Co., Ltd.
Walsh Plate & Structural Works, Ltd.
Waterous Engine Works Co., Ltd.

Plates—Calenders:
Norwood Engineering Co.

Pneumatic Collecting and Conveying Systems:
Sturtevant, B. F. Co., of Canada, Ltd.

Pneumatic Thickeners:
Sherbrooke Machinery Co., Ltd.
Waterous Engine Works, Co., Ltd.

Pneumatic Tools:
Canadian Ingersoll-Rand Co., Ltd.
Canadian Allis-Chalmers, Ltd.

Presses:
Boving Hydraulic & Eng. Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Hydraulic Machinery Co., Ltd.
Northern Foundry & Machine Co.
Port Arthur Shipbuilding Co., Ltd.

Press Rolls:
Bertrams, Ltd.
Dominion Engineering Works, Ltd.
Hydraulic Machinery Co., Ltd.
Process Engineers, Ltd.
Port Arthur Shipbuilding Co., Ltd.
Sherbrooke Machinery Co., Ltd.
Waterous Engine Works, Co., Ltd.

Pulleys:
Boving Hydraulic & Eng. Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Allis-Chalmers, Ltd.
Dominion Engineering Works, Ltd.
Diamond State Fibre Cof Can., Ltd.
Hamilton, William Co., Ltd.
Northern Foundry & Machine Co., Ltd.
Victoria Foundry, Ltd.
Waterous Engine Works, Co., Ltd.

Pulp Slashers:
Hamilton, William Co., Ltd.

Pulp Stones:
Beveridge Supply Co., Ltd.
Cleveland Stone Co.
International Pulp Stone Co.
Imperial Trading Co.
Lombard & Co.
Miramichi Quarry Co., Ltd.
Smallwood Stone Co.
Smallwood-Low Stone Co.

Pulp Thickeners:
Hydraulic Machinery Co., Ltd.
Pulp & Paper Mill Accessories, Ltd.
Port Arthur Shipbuilding Co., Ltd.

Pulp Wood:
Crittsinger, Burt C.

Pumps:
Bertrams, Ltd.
Boving Hydraulic & Engineering Co., Ltd.
Canadian Allis-Chalmers, Ltd.
Can. Fairbanks-Morse Co., Ltd.
Canadian Farnsworth Co.
Canadian Ingersoll-Rand Co., Ltd.
Carthage Machine Co.
Darling Bros., Ltd.
Dominion Engineering Works, Ltd.
Downingtown Mfg. Co.
Goldie & McCulloch Co., Ltd.
Fraser & Chalmers, Canada, Ltd.
Hydraulic Machinery Co., Ltd.
Hamilton, Wm. Co., Ltd.
Harland Engineering Co., Ltd.
The Mason Regulator & Eng. Co.
Lawrence Machine Co.
Lea-Courtenay Co.
McAvity, T. & Son.
Northern Foundry & Machine Co.
Ontario Wind Engine and Pump Co., Ltd.
Peacock Bros., Ltd.
Port Arthur Shipbuilding Co., Ltd.
Smart-Turner Machine Co. Ltd
Sherbrooke Machinery Co., Ltd.
Victoria Foundry, Ltd.
Walmsley, Charles & Co., Ltd.
Waterous Engine Works, Co., Ltd.
Weir, Ltd., G. & J.

Pumps—Boiler Feed:
Canadian Allis-Chalmers, Ltd.
Can. Farnsworth Co., Ltd.
Darling Bros., Ltd.
Fraser & Chalmers, Canada, Ltd.
Goldie & McCulloch Co., Ltd.
Harland Eng. Co., Ltd.
Mason Regulator & Eng. Co.
McAvity & Sons, Ltd., T.
Northern Foundry & Machine Co., Ltd

Pyrometers:
The Mason Regulator & Eng. Co.

Radial Brick:
Canadian Kellogg Co., Ltd.

Rag Cutters:
Perkins, B. F. & Son, Inc.

Rag Cutter Knives:
J. W. Bolton & Sons, Inc.
Pulp & Paper Mill Accessories, Ltd

Rails—Re-laying:
Gartshore, J. I.
Gilman, R. T & Co.

Recording Instruments:
Foxboro Co., Inc.
Peacock Bros., Ltd.

Recovery Systtms:
Process Engineers, Ltd.
Ernest Scott

Refiners:
Bertrams, Ltd.
Boving Hydraulic & Eng. Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Marx, J. & Co.
Port Arthur Shipbuilding Co., Ltd.
Process Engineers, Ltd.
Walmsley, Charles & Co., Ltd.
Waterous Engine Works, Co., Ltd.

Regulators—Steam.
Mason Regulating & Eng. Co., Ltd.
Pickles, W. F.

Regulators:
Mills Works & Machinery, Ltd.
M. G. Tibbitts.
Trimbey & Allen.

Reinforced Concrete:
Canadian Kellogg Co.

Rods—Copper, Brass and Bronze:
Allen, Everitt & Sons, Ltd.
Imperial Trading Co.
Tallman Brass & Metal, Ltd.

Rods—Welding:
Tallman Brass & Metal, Ltd.

Roofings—Plastic and Liquid:
Barrett Co., Ltd.
Beveridge Supply Co., Ltd.
Can. Johns-Manville Co., Ltd.
Reed & Co., Ltd., Geo. W.

Rope:
Jones & Glassco.
Goldie & McCulloch Co., Ltd.

Rosin Size:
Imperial Trading Co.
Process Engineers, Ltd.
Vera Chemical Co. of Canada, Ltd.
Wilson Paterson Co.

Rosin Size Boilers and Dissolvers:
Process Engineers, Ltd.

Rotary Cutter Knives:
J. W. Bolton & Sons, Inc.
Pulp & Paper Mill Accessories, Ltd.

Rotary Sulphur Furnaces:
MacKinnon Steel Co., Ltd.
Stebbins Engineering & Mfg. Co.

Safes:
Canadian Fairbanks-Morse Co., Ltd.
Goldie & McCulloch Co., Ltd.

Salt:
The Canadian Salt Co., Ltd.

Salt Cake:
Imperial Trading Co.
M. Gottesman & Co., Inc.
The Kalbfleisch Corporation.

Save-Alls:
MacKinnon Steel Co., Ltd.
Pulp & Paper Mill Accessories, Ltd.
Port Arthur Shipbuilding Co., Ltd.
Sherbrooke Machinery Co., Ltd.
Waterous Engine Works, Co., Ltd.

Saw Frames:
Canadian Fairbanks-Morse Co., Ltd.
Ontario Wind Engine and Pump Co., Ltd.
Waterous Engine Works Co., Ltd

MILL SUPPLIES.—Continued.

Scales:
Canadian Fairbanks-Morse Co., Ltd.
International Bus. Machines. Co., Ltd.

Screen Plates:
Bertrams, Ltd.
Union Screen Plate Co. of Canda.
Vulcan Iron Works, Ltd.
Waterous Engine Works, Co., Ltd.

Screens:
Bertrams, Ltd.
Boving Hydraulic & Eng. Co., Ltd.
Canadian Ingersoll-Rand Co., Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Canadian Link-Belt Co., Ltd.
Can. Mead-Morrison Co., Ltd.
Carthage Machine Co.
Hamilton, William Co., Ltd.
Hydraulic Machinery Co., Ltd.
Marx, J. & Co.
Perkins & Son, Inc., B. F.
Pulp & Paper Mill Accessories, Ltd.
Process Engineers, Ltd.
Sherbrooke Machinery Co., Ltd.
Walmsley, Charles & Co., Ltd.
Waterous Engine Works, Co., Ltd.
Westbye, P. P.

Securities:
Greenshields & Co.
Royal Securities Corp.

Separators—Oil:
Canadian Allis-Chalmers, Ltd.
Darling Bros., Ltd.
Goldie & McCulloch Co., Ltd.
The Mason Reg. & Eng. Co.

SeparatorsSteam:
Crane Co., Ltd.
Foxboro Co., Inc.
Mason Reg. & Eng. Co.
Peacock Bros., Ltd.
Port Arthur Shipbuilding Co., Ltd.

Shafting:
Canadian Allis-Chalmers, Ltd.
Canadian Fairbanks-Morse Co., Ltd.
Dominion Engineering Works, Ltd.
Gilman, R. T. & Co.
Northern Foundry & Machine Co., Ltd.
Victoria Foundry Co., Ltd.
Waterous Engine Works, Co., Ltd.

Sheet Lead:
The Canada Metal Co., Ltd.
Hoyt Metal Co.
Jas. Robertson Co., Ltd.

Sheets—Copper, Brass and Bronze:
Allen, Everitt & Sons, Ltd.
Imperial Trading Co.
McAvity & Sons, Ltd., T.
Tallman Brass & Metal, Ltd.

Shingle Machines:
Canadian Fairbanks-Morse Co., Ltd.
Victoria Foundry, Ltd.

Shower Pipes:
Dominion Engineering Works, Ltd.
Hydraulic Machinery Co., Ltd.

Shredders:
Toronto Type Foundry Co., Ltd.

Size:
Vera Chemical Co., Ltd.

Slab Chippers:
Boving Hydraulic & Eng. Co., Ltd.
Pulp & Paper Mill Accessories, Ltd
Waterous Engine Works, Co., Ltd.

Slitters and Re-Winders:
Bertrams, Ltd.
Cameron Machine Co.
Canadian Fairbanks-Morse Co., Ltd.
Dominion Engineering Works, Ltd.
Langston Co., Samuel M.
Morrison, The J. L. Co.
Ticonderoga Machine Works.
Toronto Type Foundry
Walmsley, Charles & Co., Ltd.

Sinks and Taps—Laboratory, Acid Proof:
Knight, Maurice A.

Smelter Lining:
Beveridge Supply Co., Ltd.
Canadian Allis-Chalmers, Ltd.
Winn & Holland, Ltd.

Smoke Stacks:
Can. Allis-Chalmers, Ltd.
Can. Des Moines Steel Co., Ltd.
Dominion Engineering Works, Ltd.
Hamilton Co., Wm.
MacKinnon Steel Co., Ltd.
Port Arthur Shipbuilding Co., Ltd.
Toronto Iron Works, Ltd.
Vulcan Iron Works, Ltd.
Walsh Plate & Structural Works, Ltd.
Waterous Engine Works, Co., Ltd.

Soda Ash:
Imperial Trading Co.
McArthur, Irwin, Ltd.
Wilson, Paterson Co.

Soot Cleaners:
Beveridge Supply Co., Ltd.

Solder :
Canada Metal Co.
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OF CANADA

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INTERNATIONAL NUMBER December, 1921.

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NOTE:—The publishers regret that labor troubles have delayed the appearance of this number of the Pulp and Paper Magazine.

Published every Thursday by the Industrial and Educational Publishing Company, Limited, Garden City Press, Ste. Anne de Bellevue. 'Phone 165.

J. J. Harpell, President and Managing Director.

A. S. Christie, Eastern Manager, Gardenvale, P. Q.

H. W. Thompson, Western Manager, Aladding Bldg., 208 King St. W., Toronto. 'Phone Adelaide 3310.

F. E. Payson, Pacific Coast Manager, 528 Winch Building, Vancouver.

Official Journal of the Technical Section of the Canadian Pulp and Paper Association.

J. NEWELL STEPHENSON, M. S., Editor.

The editor cordially invites readers to submit articles of practical interest which, on publication, will be paid for.

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GARDENVALE, QUE.

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Limited

The Spanish River Pulp and Paper Mills, Limited.



Where the Company gets its Name, the Span ish River and the Espanola Mill, Where Six Machines Make 290 T ons of Paper Daily.

Where 200,000 Tons of Newsprint Are Made.

The Spanish River Pulp and Paper Mills, Limited, occupies a commanding position in the Canadian pulp and paper industry. Of newsprint paper alone the company produces 200,000 tons a year, or, approximately, one fifth of the total annual output of newsprint in the Dominion. In addition, it manufactures and sells some 7,000 tons of millboard and some 15,000 tons of sulphite more than is required for its own use.

The company owns and operates three mills, located, respectively, at Sault Ste. Marie, Espanola and Sturgeon Falls, Ontario. These mills have been brought up to a high state of efficiency and productiveness by the expenditure during the past two years of upwards of $4,000,000 in new equipment and betterments. Together they constitute a self-integrated and perfectly-balanced property, capable of yielding a maximum production at a minimum of expense. The advantages thus acquired are reflected in lessened costs of manufacture and consequent increased returns to the company. They have placed the company in an exceptionally favourable position to face whatever conditions may develop.

The Espanola Mill.

The Espanola Mill is located on the Spanish River at Espanola, Ont., 40 miles west of Sudbury and 138 miles east of Sault Ste. Marie, on the Soo branch of the Canadian Pacific Railway. The Algoma Eastern Railway affords outlet for the company's products.

The Espanola plant includes a six machine paper mill of 290 tons daily capacity, wood grinders, capable of producing 225 tons of pulp daily with other equipment to correspond. Much of the machinery is new and of recent installation. The company owns its own waterpower, with a developed capacity of 15,000 h. p. and capable of further development. The Company has recently made a contract for 6,000 h.p. of electrical 14 miles of 33,000 volts transmission line to convey the energy to operate electric grinders, and has constructed power to the mill. The power will produce an additional 90 tons of groundwood per day. It also owns a considerable townsite, including numerous dwellings for its employees, a hotel, said to be the best in Northern Ontario; a general store, which deals in everything from pianos to frying pans, including in its equipment an up-to-date refrigerating plant; public and separate schools, a fine community hall, a theatre, and the biggest and best-appointed skating and curling rink in the district. The town is a model industrial community. Its fire protection and water and lighting systems are maintained by the company. In connection with its community work, the company publishes a weekly newspaper called "The Spanish River News," for the purpose of maintaining the esprit-de-corps of its employees and of instructing them in "safety first" methods.



Except for the Huge Wood and Coal Piles and Railway Tracks, the Big Paper Mill at Sault Ste. Marie Might be Mistaken for a Castle.

The Sault Ste. Marie Plant.

The company maintains its headquarters and general offices at Sault Ste. Marie, where its principal mill is also located. The buildings are extensive in dimension and massive in appearance, being substantially built of red sandstone, quarried from the beds of the adjacent power canals, and with rather more than ordinary attention given to their architectural aspect.

As already stated, this mill enjoys unusual advantages in the way of rail and water transportation, both for shipping out its finished products and for bringing in its raw materials.

Included in the group of mills of the company at the Sault are a sulphite pulp mill, a ground wood pulp mill, a board mill for making cardboard and heavy wrapping paper and a newsprint paper mill. The sulphite mill has an output of 160 tons for a day of 24 hours, the groundwood mill an output of 200 tons of groundwood pulp, the board mill 35 tons a day, and the newsprint mill 250 tons a day. In 1912, when the newsprint mill opened, its daily output was about 175 tons, which has been raised to the present figure by the increased efficiency in operation.

The equipment of the mill at the Sault includes in the paper mill two 156 in. Black & Clawson paper-making machines, one 186 in. Pusey & Jones machine and one 196 in. Pusey & Jones machine. In the board mill there is one 100 in. Black & Clawson 3-cylinder machine. The groundwood mill is equipped with sixteen 3-pocket and eight 4-pocket water driven grinders and six electrically driven grinders. In the sulphite pulp mill there are four 17 feet x 54 feet digesters.

About 15 per cent of the output of the paper mill is used in Canada, the remainder going to the United States. The newspapers of the city of Detroit are practically supplied by the company, and also those of the surrounding cities of importance in Michigan. Some of the output goes to Ohio, Missouri, Indiana and Illinois. The heavy wrapping paper made in the board mill is used largely by the company itself in wrapping the rolls of newsprint. The card is exported principally to New York State. There is in addition a surplus of sulphite pulp manufactured here, which is sold mainly in Wisconsin, some of it going to Minnesota.

With the board mill, the company is enabled to turn to account screenings and other by-products which formerly went to waste. In addition to manufacture of board, the mill makes all the wrappings used at the company's several mills as well as a considerable quantity sold to outside consumers.

These are some of the principal additions made to the Sault plant within the last two years. There are a number of others of minor importance.



The River is an Exciting Place When "The Drive" is on.



In the Foreground Are Seen Part of the Sides of the Gorge Through Which the Sturgeon River falls into Lake Nipissing. The Picturesque Power Site Where the Sturgeon Falls Unit is Located.

The Sturgeon Falls Mill.

The Sturgeon Falls mill is located at Sturgeon Falls on the main line of the Canadian Pacific Railway, 24 miles west of North Bay, Ont., the junction point of the Canadian Pacific and the Grand Trunk Railways.

The Sturgeon Falls timber limits embrace the watershed of the Sturgeon river which empties into Lake Nipissing. They are bounded on the west by Wanapititae Lake and on the east by the Montreal river. The Sturgeon river, 200 miles in length, together with its tributaries, drains the entire concession. Nearly all of these tributaries are navigable for logging and the many lakes throughout the tract insure a constant and efficient water supply to float the timber to the mills. The numerous driving streams assist in maintaining a low cost of wood operations.

The power development at Sturgeon Falls is approximately 10,000 h.p. The Company has recently completed a new power development for 10,000 h.p. at Smoky Falls on the Sturgeon River, 8 miles above the Sturgeon Falls mill. The initial development is two units of 2,600 h.p. each, while the power house has been completed for a total of four units. The power is transmitted to the mill at 22,000 volts.

The Sturgeon Falls plant consists of groundwood and sulphite pulp mills, a three-machine paper mill with a daily capacity of 130 tons of paper, of which about 60 per cent is newsprint and the rest hanging paper. Its groundwood capacity is 110 tons, and its sulphite capacity 60 to 70 tons daily. This mill is especially adaptable to conversion into a specialty mill whenever it becomes desirable.

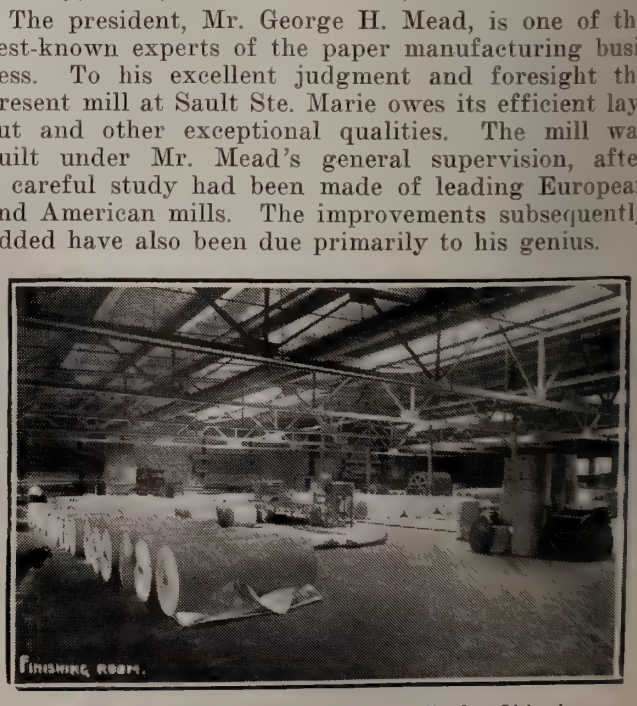
Daily Capacity—670 Tons Newsprint
535 Tons Groundwood
220 Tons Sulphite
35 Tons Board

Administration in Capable Hands.

The administration of the company's affairs is in the hands of unusually competent and successful executives. The officers and directors of the company are:

President, G. H. Mead, Dayton, Ohio; vice-presidents, P. B. Wilson, Sault, and Thos. Gibson, Toronto; secretary, J. G. Gibson, Toronto; treasurer, A. H. Chitty, Sault; directors, G. H. Mead, P. B. Wilson, T. Gibson, T. W. Sime, Toronto, C. E. Read, Ottawa, G. R. Gray, Sault, and T. H. Watson, Toronto.

The president, Mr. George H. Mead, is one of the best-known experts of the paper manufacturing business. To his excellent judgment and foresight the present mill at Sault Ste. Marie owes its efficient layout and other exceptional qualities. The mill was built under Mr. Mead's general supervision, after a careful study had been made of leading European and American mills. The improvements subsequently added have also been due primarily to his genius.



The Final Touch. Wrapping the Rolls for Shipping.

The Company's Timber Limits.

The company controls about 18,000 square miles of timber-lands, which are estimated to contain a quantity sufficient to supply the normal requirements of the company for a long period, its annual wood consumption approximating 350,000 cords. A considerable tract of these woodlands is along the east and north shores of Lake Superior and most of it is easily accessible. Here, the logs, after being cut, are conveyed either directly or by means of contributory streams into Lake Superior, whence they are rafted by the company's own fleet of tugs to extensive booming grounds at Sault Ste. Marie, where a considerable supply of wood is constantly stored. Other large tracts of woodlands, located along the banks of the Spanish and Sturgeon rivers and the streams tributary thereto, are also controlled by the company. These supply the mills at Espanola and Sturgeon Falls.

The supply of power at all three mills is ample, constant and of economical development, and affords opportunity for expansion to meet any reasonable future requirement.

Not the least of the companys most valuable and important assets is its possession of a 60-acre tract of land, with an extensive water-front and excellent railroad connections, at Sault Ste. Marie. It includes the present mill-site and provides storage grounds for wood, coal, sulphur, etc., etc., as well as affording abundant scope for future development. The Canadian Pacific Soo Line and the Algoma Central Railway both connect with the property which also has its own dock facilities. An anticipated development contemplates the building of extensive modern wharves and a general improvement of the adjacent harbor in conjunction with elaborate plans already devised by the Dominion Government.

The company gives regular employment to 2,000 employees inclusive of mill operatives and office staff, and during the cutting season employs 5,000 woodsmen, the number varying according to the conditions of the labour market and the company's immediate requirements.

The company's annual turn-over exceeds $18,000,000. It has over 2,000 shareholders, scattered throughout Canada, the United States and Great Britain.

The Company's Financial Position.

The Spanish River Pulp & Paper Mills, Limited, was organized in 1910. It succeeded to and acquired the property of an earlier corporation known as the Spanish River Pulp and Paper Company, which owned the Espanola Mill. In 1912, the Company absorbed the Ontario Pulp and Paper Company, and in 1913 acquired the property of the Lake Superior Company, Limited, including the mill at Sault Ste. Marie. The capitalization consists of a bond issue of which there is now outstanding $8,224,000, an issue of $3,500,000 serial notes of which $2,310,000 are outstanding, and general mortgage bonds to the extent of $2,500,000, and issued capital stock of $17,615,000.

The last issued statement of the company shows the net earnings for the year ending June 30, 1921, as $4,836,001, an increase of $920,950, as compared with 1920. After deducting interest charges of $744,371 and depreciation of $628,480, the net surplus for the year was $3,463,150. From this $500,000 was deducted for government taxes and contingencies, leaving to be added to the consolidated profit and loss balance from last year a sum of $2,963,150, or a total of $4,023,948 out of which dividends at the rate of 7 per cent per annum on the Preferred and Common have been paid.



Spanish River Quality is Partly Due to the Company's Fine Timber.

COMPARATIVE PROFIT AND LOSS STATEMENT OF THE COMPANY FOR THE PAST SIX YEARS.

	1921	1920	1919	1918	1917	1916
Net Revenue	$4,836,001	$3,915,051	$2,757,964	$1,729,231	$2,117,734	$1,324,390
Depreciation	628,480	594,620	501,068	344,137	260,821	145,172
	$4,207,521	$3,320,431	$2,256,896	$1,385,094	$1,847,913	$1,197,218
Interest	744,371	768,362	799,975	807,519	718,409	765,927
	$3,463,150	$2,552,069	$1,456,921	$ 577,575	$1,129,504	$ 431,291
Appropriation for Contingencies and General Taxes	500,000	350,000	160,000	.....	.....	.....
	$2,963,150	$2,202,069	$1,296,921	$ 577,575	$1,129,504	$ 431,291
Previous Balance	1,060,798	2,368,222	1,071,301	993,726	699,621	268,330
	$4,023,948	$4,570,291	$2,368,222	$1,571,301	$1,829,125	$ 699,621
Dividends & Bond Sinking Fund Reserve	1,674,152	3,509,493	.....	.....	.....	.....
Written off Deficiency Account	.....	.....	.....	500,000	835,399	.....
Profit and Loss Surplus	$2,349,796	$1,060,798	$2,368,222	$1,071,301	$ 993,726	$ 699,621

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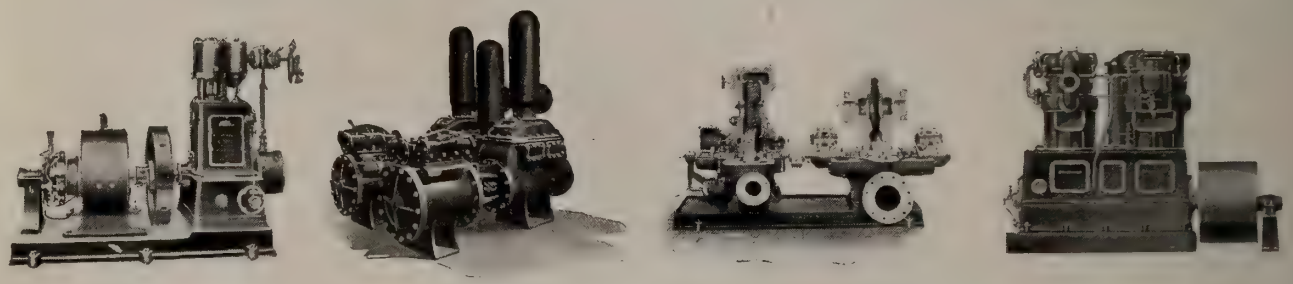
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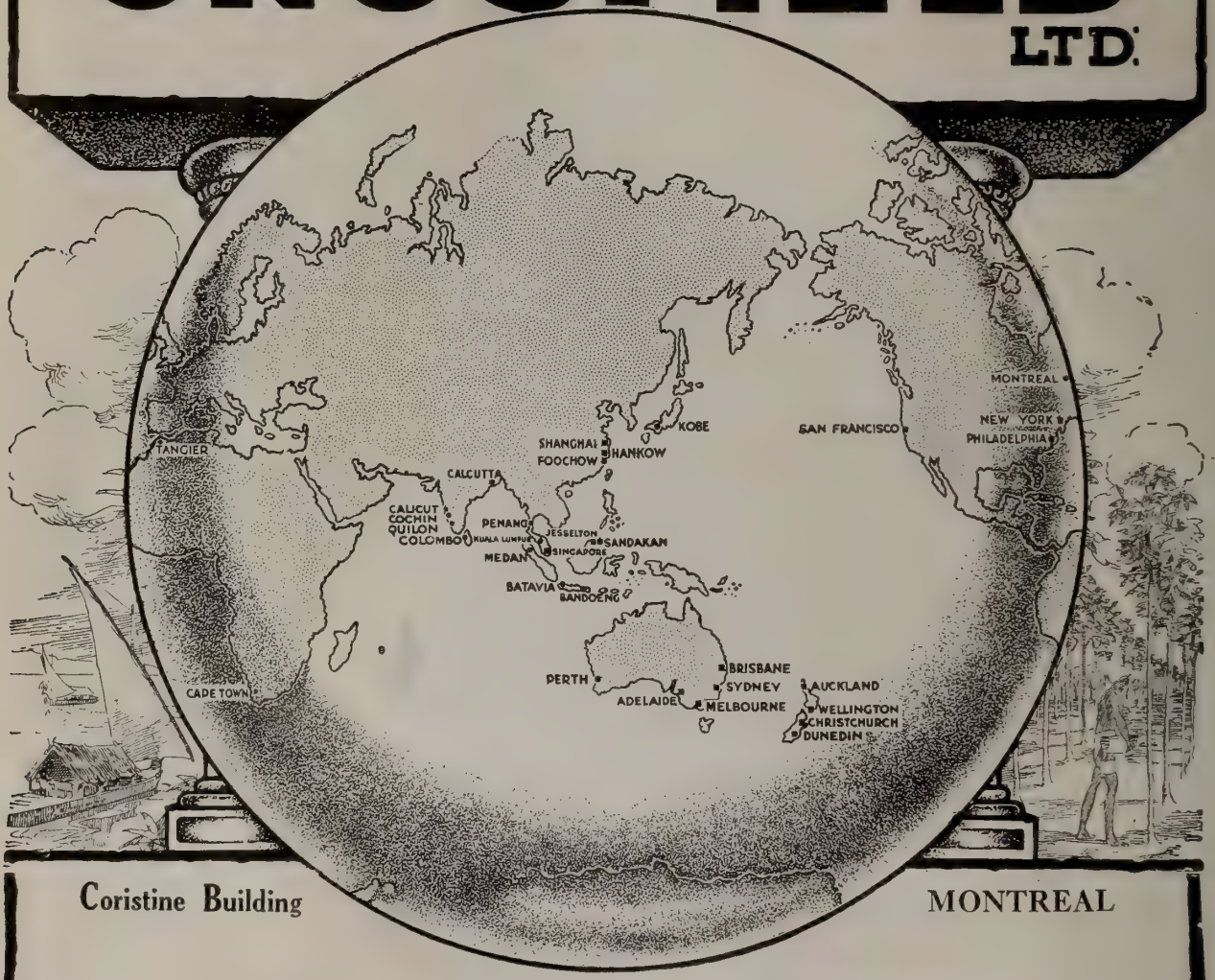
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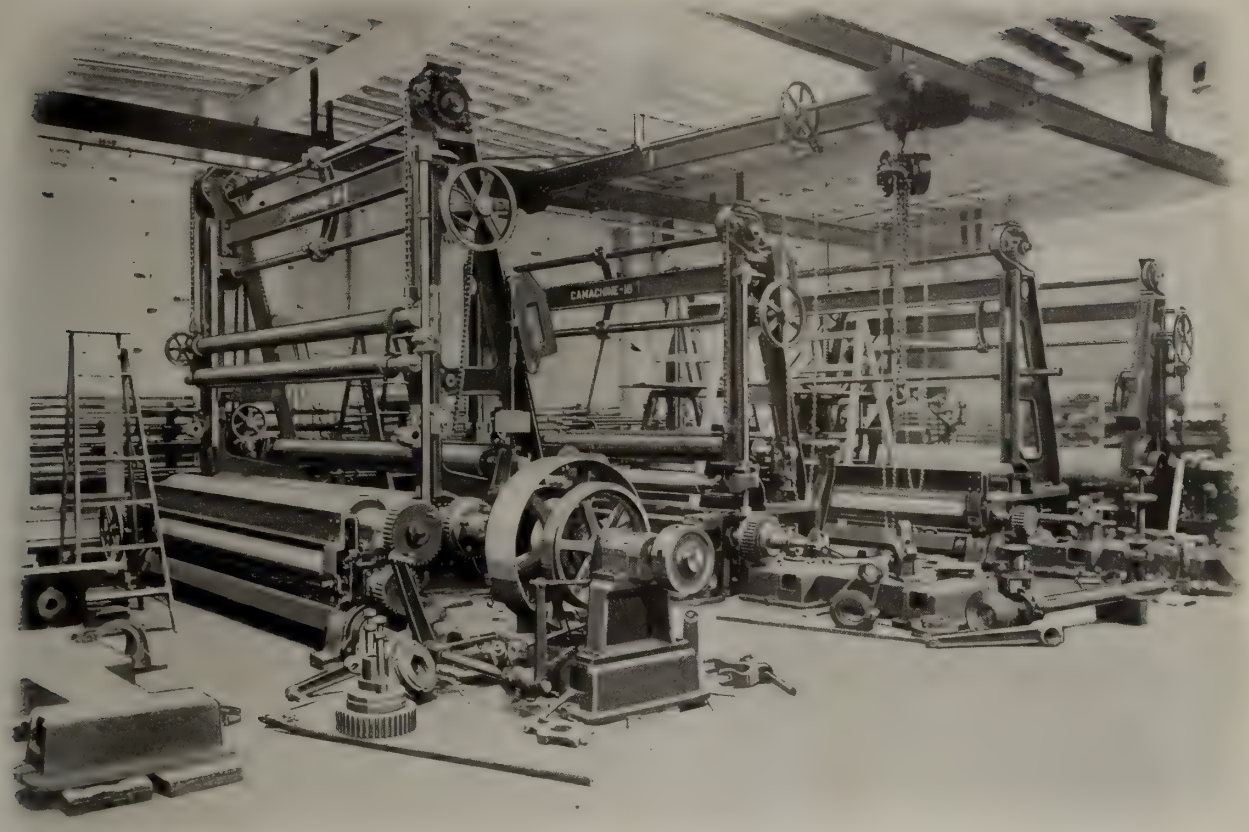
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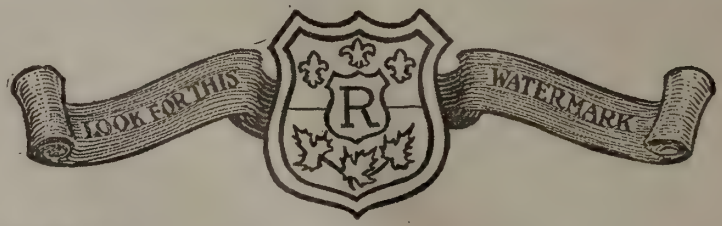
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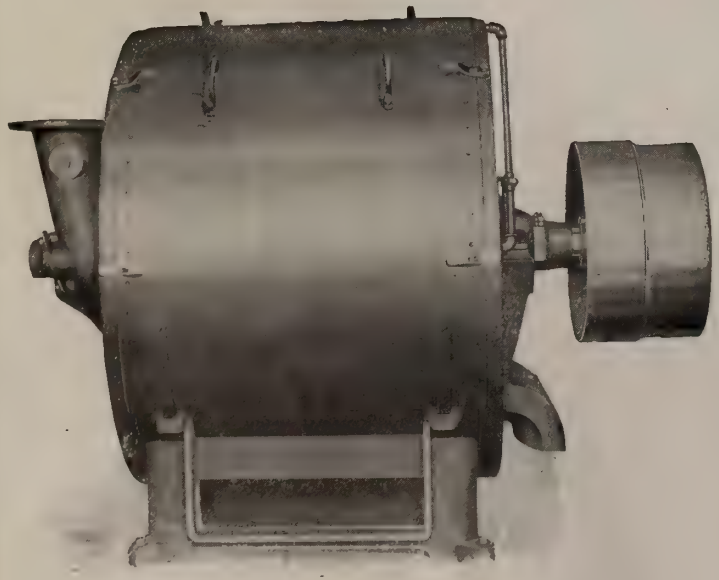
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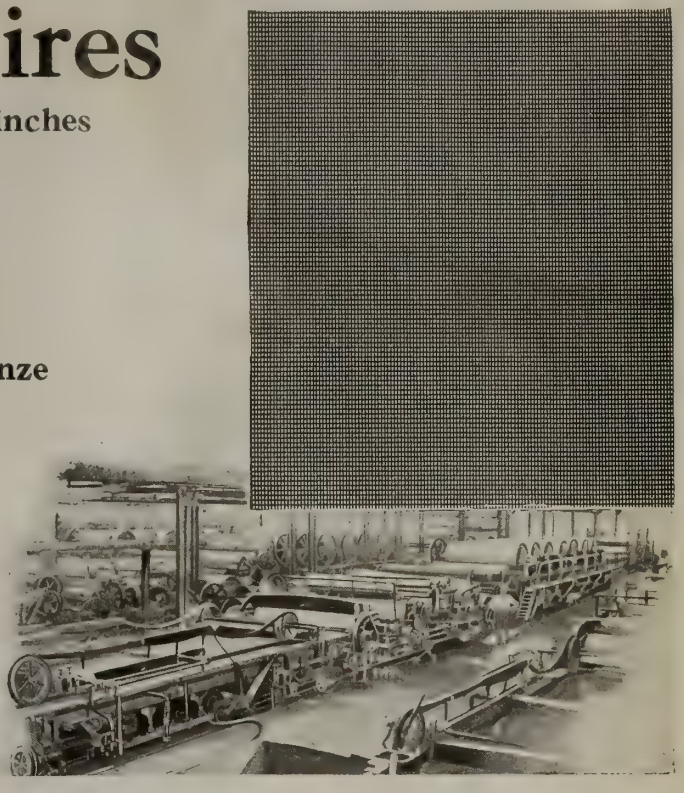
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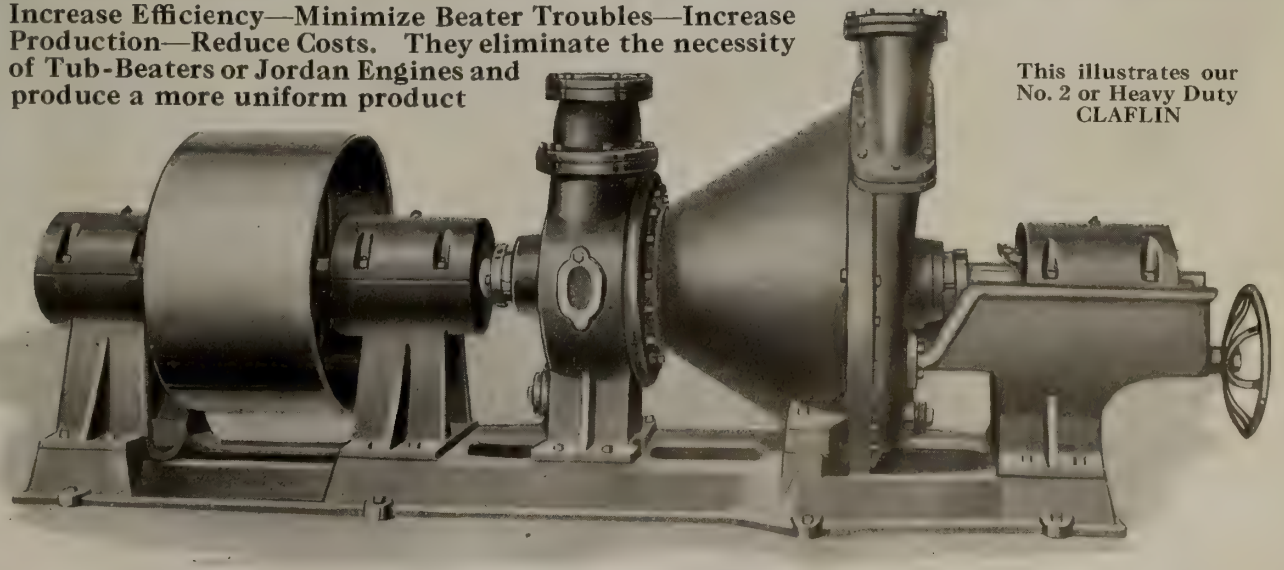
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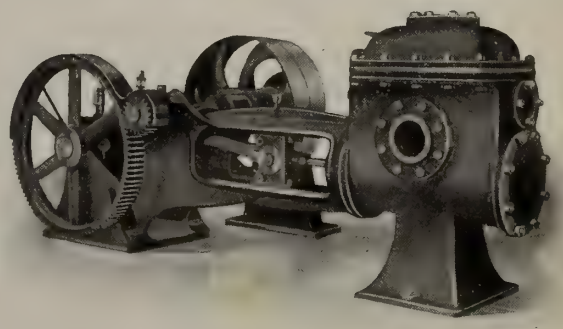
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